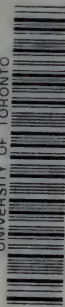


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THE TROPICAL WORLD.

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LONDON: PRINTED BY  
SPOTTISWOODE AND CO., NEW-STREET SQUARE  
AND PARLIAMENT STREET

111.



PRIMITIVE FOREST.

111

# THE TROPICAL WORLD:

ASPECTS OF MAN AND NATURE

IN

THE EQUATORIAL REGIONS OF THE GLOBE.

BY

DR. G. HARTWIG,

AUTHOR OF 'THE SEA AND ITS LIVING WONDERS,' 'THE SUBTERRANEAN WORLD,'  
'THE HARMONIES OF NATURE,' AND 'THE POLAR WORLD.'

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WITH EIGHT CHROMOXYLOGRAPHIC PLATES AND NUMEROUS WOODCUTS.

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NEW EDITION.

111255-  
20/5/11

LONDON:

LONGMANS, GREEN, AND CO.

1873.

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## PREFACE.



THE numerous alterations I have made in this new edition of the 'Tropical World,' both by the attentive revision of its former contents, and the addition of new chapters descriptive of the chief characteristics of the various tropical races of man ; as well as the care I have taken to condense as much information as possible within narrow limits, will, I hope, justify my assertion that I have done my best to please indulgent readers, and to merit the favourable verdict of severer critics.

Dr. HARTWIG.

Salon Villas, Ludwigsburg (Württemberg):  
*March 10, 1873.*



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TROPICAL TORNADO.

## CHAPTER I.

### THE DIVERSITY OF CLIMATES WITHIN THE TROPICS.

Causes by which it is produced—Abundance and Distribution of Rain within the Tropics—The Trade Winds—The Belt of Calms—Tropical Rains—The Monsoons—Tornados—Cyclones—Typhoons—Storms in the Pacific—Devastations caused by Hurricanes on Pitcairn Island and Rarotonga.

ON surveying the various regions of the torrid zone, we find that Nature has made many wonderful provisions to mitigate the heat of the vertical sun, to endow the equatorial lands with an amazing variety of climate, and to extend the benefit of the warmth generated within the tropics to countries situated far beyond their bounds.

Thus, while the greater part of the northern temperate zone is occupied by land, the floods of ocean roll over by far the greater portion of the equatorial regions—for both torrid America and Africa appear as mere islands in a vast expanse of sea.

The conversion of water, by evaporation, into a gaseous form is accompanied by the abstraction of heat from surrounding bodies, or, in popular language, by the production of cold; and thus over the surface of the ocean the rays of the sun have a tendency to check their own warming influence, and to impart

a coolness to the atmosphere, the refreshing effects of which are felt wherever the sea wind blows. There can, therefore, be no doubt that, if the greater part of the tropical ocean were converted into land, the heat of the torrid zone would be far more intolerable than it is.

The restless breezes and currents, the perpetual migrations of the air and waters, perform a no less important part in cooling the equatorial and warming the temperate regions of the globe. Rarefied by the intense heat of a vertical sun, the equatorial air-stream ascends in perpendicular columns high above the surface of the earth, and thence flows off towards the poles; while, to fill up the void, cold air-currents come rushing from the arctic and antarctic regions.

If caloric were the sole agent on which the direction of these antagonistic air-currents depended, they would naturally flow to the north and south; but the rotation of the earth gradually diverts them to the east and west, and thus the cold air-currents, or polar streams, ultimately change into the trade winds which regularly blow over the greater part of the tropical ocean from east to west, and materially contribute, by their refreshing coolness, to the health and comfort of the navigator whom they waft over the equatorial seas.

While the polar air-currents, though gradually warming as they advance, thus mitigate the heat of the torrid zone, the opposite equatorial breezes, which reach our coasts as moist south-westerly or westerly winds, soften the cold of our winters, and clothe our fields with a lively verdure during the greater part of the year. How truly magnificent is this grand system of the winds, which, by the constant interchange of heat and cold which it produces, thus imparts to one zone the beneficial influence of another, and renders both far more fit to be inhabited by civilized man. The Greek navigators rendered homage to Æolus, but they were far from having any idea of the admirable laws which govern the unstable, ever-fluctuating domains of the 'God of the Winds.'

The same unequal influence of solar warmth under the line and at the poles, which sets the air in constant motion, also compels the waters of the ocean to perpetual migrations, and produces those wonderful marine currents which like the analogous atmospheric streams, furrow in opposite directions the

bosom of the sea. Thanks to this salutary interchange, the Gulf Stream, issuing from the Mexican Sea, and thence flowing to the north and east, conveys a portion of its original warmth as far as the west coast of Spitzbergen and Nowaja Semlja; while in the southern hemisphere we see the Peruvian stream impart the refrigerating influence of the antarctic waters to the eastern coast of South America.

The geographical distribution of the land within the tropics likewise tends to counterbalance or to mitigate the excessive heat of a vertical sun; for a glance over the map shows us at once that it is mostly either insular or extending its narrow length between two oceans, thus multiplying the surface over which the sea is able to exert its influence. The Indian Archipelago, the peninsula of Malacca, the Antilles, and Central America, are all undoubtedly indebted to the waters which bathe their coasts for a more temperate climate than that which they would have had if grouped together in one vast continent.

The temperature of a country proportionally decreases with its elevation; and thus the high situation of many tropical lands moderates the effects of equatorial heat, and endows them with a climate similar to that of the temperate, or even of the cold regions of the globe. The Andes and the Himalaya, the most stupendous mountain-chains of the world, raise their snow-clad summits either within the tropics or immediately beyond their verge, and must be considered as colossal refrigerators, ordained by Providence to counteract the effects of the vertical sunbeams over a vast extent of land. In Western Tropical America, in Asia, and in Africa, we find immense countries rising like terraces thousands of feet above the level of the ocean, and reminding the European traveller of his distant northern home by their productions and their cooler temperature. Thus, by means of a few simple physical and geological causes acting and reacting upon each other on a magnificent scale, Nature has bestowed a wonderful variety of climate upon the tropical regions, producing a no less wonderful diversity of plants and animals.

But warmth alone is not sufficient to call forth a luxuriant vegetation: it can only exert its powers when combined with a sufficient degree of moisture; and it chiefly depends upon the presence or absence of water whether a tropical country

appears as a naked waste or decked with the most gorgeous vegetation.

As the evaporation of the tropical ocean is far more considerable than that of the sea in higher latitudes, the atmospheric precipitations (dew, rain) caused by the cooling of the air are far more abundant in the torrid zone than in the temperate regions of the earth. While the annual fall of rain within the tropics amounts, on an average, to about eight feet, it attains in Europe a height of only thirty inches; and under the clear equatorial sky the dew is often so abundant as to equal in its effects a moderate shower of rain.

But this enormous mass of moisture is most unequally distributed; for while the greater part of the Sahara and the Peruvian sand-coast are constantly arid, and South Africa and North Australia suffer from long-continued droughts, we find other tropical countries refreshed by almost daily showers. The direction of the prevailing winds, the condensing powers of high mountains and of forests, the relative position of a country, the nature of its soil, are the chief causes which produce an abundance or want of rain, and consequently determine the fertility or barrenness of the land. Of these causes, the first-mentioned is by far the most general in its effects—so that a knowledge of the tropical winds is above all things necessary to give us an insight into the distribution of moisture over the equatorial world.

I have already mentioned the trade winds, or cool reactionary currents called forth by the ascending equatorial air-stream; but it will now be necessary to submit them to a closer examination, and follow them in their circular course throughout the tropical regions. In the Northern Atlantic, their influence, varying with the season, extends to  $22^{\circ}$  N. lat. in winter, and  $39^{\circ}$  N. lat. in summer; while in the southern hemisphere they reach no farther than  $18^{\circ}$  S. lat. in winter, and  $28^{\circ}$  or  $30^{\circ}$  S. lat. in summer.

In the Pacific, their limits vary between  $21^{\circ}$  and  $31^{\circ}$  N. lat., and between  $23^{\circ}$  and  $33^{\circ}$  S. lat.; so that, on the whole, they have here a more southern position, owing, no doubt, to the vast extent of open sea; while in the Atlantic the influence of the neighbouring continents forces them to the north, and even causes the trade winds of the southern hemisphere to ascend

beyond the equatorial line. Their character is that of a continual soft breeze—strongest in the morning, remitting at noon, and again increasing in the evening. In the neighbourhood of the coasts, except over very small islands, they become weaker, and generally cease to be felt at a distance of about fifteen or twenty miles from the sea, though, of course, at greater heights they continue their course uninterruptedly over the land.

For obvious reasons the trade winds have been much more accurately investigated upon the ocean than on land, particularly in the Northern Atlantic, which is better known in its physical features than any other sea, as being a highway for numberless vessels to which the study of the winds is a matter of the greatest importance; yet, in spite of so many disturbing influences, their course, even over the continents, has been ascertained by travellers. North-easterly winds almost constantly sweep over the Sahara; and in South Africa, Dr. Livingstone informs us that north-easterly and south-easterly winds blow over the whole continent between  $12^{\circ}$  and  $6^{\circ}$  S. lat., even as far as Angola, where they unite with the sea winds.

In Brazil, the presence of the trade winds has been determined with still greater accuracy. Thus easterly breezes almost perpetually sweep over the boundless plains up to the slopes of the Andes, and even in Paraguay ( $25^{\circ}$  S. lat.) a mild east wind constantly arises in summer after the setting of the sun.

As the trade winds originate in the coldest, and thence pass onwards to the warmer regions, they are, of course, constantly absorbing moisture as they advance over the seas. Saturated with vapours, they reach the islands and continents, where, meeting with various refrigerating influences (mountain-chains, forests, terrestrial radiation), their condensing vapours give rise to an abundance both of rain and dew. It is owing to their influence that in general, within the tropics, the eastern coasts, or the eastern slopes of the mountains, are better watered than the interior of the continents or lands with a western exposure.

An example on the grandest scale is afforded to us by South America, where the Andes of Peru and Bolivia so effectually drain the prevailing east winds of their moisture, that while numberless rivulets, the feeders of the gigantic Marañon, clothe their eastern gorges with a perpetual verdure, their western slopes are almost constantly arid. Such is the influence of this

colossal barrier in interrupting the course of the air-current, that the trade wind only begins to be felt again on the Pacific at a distance of one hundred or even one hundred and fifty miles from the shore.

In South Africa, also, we find the eastern mountainous coastlands covered with giant timber—in striking contrast with the parched savannas or dreary wastes of the interior; and in the South Sea the difference of verdure between the east and west coasts of the Sandwich Islands, the Feejees, and many other groups, never fails to arrest the attention of the mariner.

The trade winds of the northern and southern hemispheres do not, however, blow in one continuous stream over the whole breadth of the tropical ocean, but are separated from each other by a zone or belt of calms, occasioned by their mutually paralyzing each other's influence on meeting from the north and the south-east, and by the attraction of the sun, which, when in the zenith, changes the easterly air-currents into an ascending stream. From this dependence on the position of the sun, it may easily be inferred that the zone of calms fluctuates, like the trade winds themselves, to the north or south, according to the seasons; and that it is far from invariably occupying the same degrees of latitude, or the same width, at all times of the year. In the Atlantic, from the causes previously mentioned, it constantly remains to the north of the line, where its breadth averages five or six degrees; in the Pacific it more generally extends during the antarctic summer, on both sides of the equator.

Besides the intensity of its heat, the zone of calms is characterised by heavy showers, which regularly fall in the afternoon, and are caused by the cooling of the saturated air-columns in the higher regions of the air.

Daily, towards noon, dense clouds form in the sky, and dissolve in torrents of rain under fearful electrical explosions, now sooner, now later, of shorter or longer continuance, with increasing or abating violence, as the sun is more or less in his zenith. Towards evening the vapours disperse, and the sun sets in a clear, unclouded horizon. Thus towns or countries situated within the calms, such as Para, Quito, Bogota, Guayaquil, the Kingsmill Islands, may be said to have a perennial rainy season, as showers fall at every season of the year. To the

north and south of the belt of calms, we find in both hemispheres a broad zone, characterised by two distinct rainy seasons, separated by two equally distinct periods of dry weather. The rainy seasons take place while the sun is crossing the zenith, and more or less paralysing the power of the trade winds. Cayenne, Honduras, Jamaica, Pernambuco, Bahia, afford us examples of these well-defined alterations. In Jamaica, for instance ( $18^{\circ}$  N. lat.), the first rainy season begins in April, the second in October; the first dry season in June, and the second in December.

Towards the verge of the tropics follow the zones which are characterised by a single rainy season, but of a longer continuance, generally lasting six months, throughout the summer, or from one equinoctium to another. In these parts, the rainy season is also the warmest period of the year, since here the different height of the sun in winter and summer is already so considerable, that at the time of culmination the clouds and rain are not able to reduce the temperature below that of the clear and dry winter months; while in the zones which are situated nearer to the equator, the rainy season, in spite of the sun's culmination, is always the coolest.

To sum up the foregoing remarks in a few words: the two rainy seasons, which characterise the middle zone between each tropic and the line, have a tendency to pass into one annual rainy season on advancing towards the tropics, and to merge into a permanent rainy season on approaching the equator. As the sun goes to the north or south, he opens the sluices of heaven, and closes them as he passes to another hemisphere.

Such may be said to be the normal state which would everywhere obtain within the equatorial regions if one unbounded ocean covered their surface, and none of the disturbing influences previously mentioned interfered; but as we find the trade winds so frequently deflected from their course, we must also naturally expect the general or theoretical order of the dry and rainy seasons to be liable to great modifications.

Thus, in the Indian Ocean and in the Chinese Sea, terrestrial influences prevail during the summer which completely divert the trade wind, there called the *North-east Monsoon*, from its regular path. From the wide lands of south-eastern Asia, glowing, during the summer months, with a torrid heat, the

rarefied air, as it rises into the higher regions, completely overpowers the usual course of the trade wind, and changes it into the south-western monsoon, which blows from May to September.

Hence, during the summer months, the saturated sea wind, striking against the western ghauts, brings rain to the coast of Malabar, while the opposite coast of Coromandel remains dry; but the inverse takes place when, from the sun's declining to the south, the north-east trade wind resumes its sway.

Similar deflections from the ordinary course of the trade winds occur also on the coast of Guinea ( $5^{\circ}$  N. Lat.), in the Mexican Gulf, and in that part of the Pacific which borders on Central America, through the influence of the heated plains of Africa, Utah, Texas, and New Mexico, and have a similar influence on the distribution of moisture. Thus the sea monsoon, which prevails during the summer months on the coast of northern Guinea, carries a rainy season over the land as far as the eighteenth or nineteenth degree of northern latitude, and fertilises a vast extent of country which, from its position on the western side of an immense continent, would otherwise have been as naked and barren as the Sahara.

As the tropical rains, though generally confined only to part of the year, and then only to a few hours of the day, fall in so much greater abundance than under our constantly drooping skies, it may naturally be supposed that the single showers must be proportionally violent. Descending in streams so close and so dense that the level ground, unable to absorb it sufficiently fast, is covered with a sheet of water, the rain rushes down the hill-sides in a volume that wears channels in the surface. For hours together the noise of the torrent, as it beats upon the trees and bursts upon the roofs, occasions an uproar that drowns the ordinary voice and renders sleep impossible. In Bombay nearly nine inches of rain have been known to fall in one day, and twelve inches in Calcutta, or nearly half the mean annual quantity of rain on the east coast of England. During one single storm which Castelnau witnessed at Pebas, on the Amazon, there fell not less than thirty inches of rain—nearly as much as the annual supply of our west coast. The hollow trunk of an enormous tree in an exposed situation gave the French traveller the means of accurate measurement.

As in the equatorial regions the atmospherical precipitations are far more considerable than in the temperate zones, so also their storms rage with a violence unknown in our climes. In the Indian and Chinese Seas these convulsions of nature generally take place at the change of the monsoons; in the West Indies, at the beginning and at the end of the rainy seasons. The tornado which devastated the Island of Guadeloupe on the 25th July, 1846, blew down buildings constructed of solid stone, and tore the guns of a battery from their carriages; another, which raged some years back in the Mauritius, demolished a church and drove thirty-two vessels on the strand. On the Beagle's arrival in Port Louis, after her long and arduous surveying voyage, a fleet of crippled vessels, the victims of a recent hurricane, might have been seen making their way into the harbour—some dismasted, others kept afloat with difficulty, firing guns of distress or giving other signs of their helpless condition. 'On the now tranquil surface of the harbour lay a group of shattered vessels, presenting the appearance of floating wrecks. In almost all, the bulwarks, boats, and everything on deck, had been swept away; some, that were towed in, had lost all their masts; others, more or less of their spars; one had her poop and all its cabins swept away; many had four or five feet of water in the hold, and the clank of the pumps was still kept up by the weary crew.' \*

Such are the terrible effects of the tornados and cyclones of the Atlantic and the Indian Oceans; but the storms of the mis-called Pacific are no less furious and destructive. A hurricane, which on the 15th of April, 1845, burst over Pitcairn Island, washed all the fertile mould from the rocks, and, uprooting 300 cocoa-nut trees, cast them into the sea. Every fishing-boat on the island was destroyed, and thousands of fruit-bearing bananas were swept away.

The celebrated missionary, John Williams, † describes a similar catastrophe which befell the beautiful island of Rarotonga on the 23rd of December, 1831. The chapels, school-houses, mission-houses, and nearly all the dwellings of the natives, no less than a thousand in number, were levelled to the ground. Every particle of food on the island was destroyed.

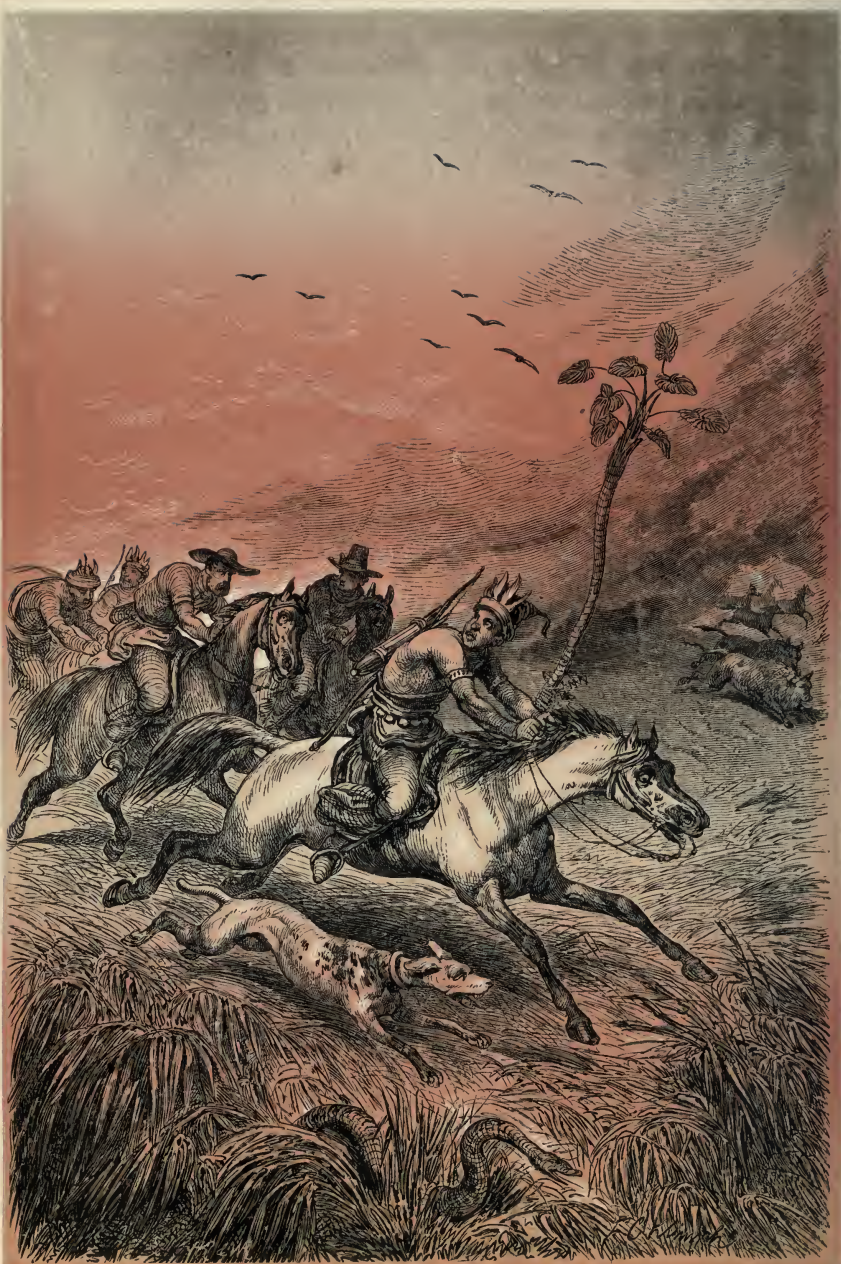
\* Captain Stokes's 'Discoveries in Australia.'

† 'Narrative of Missionary Enterprise in the South Sea Islands,' p. 390.

Of the thousands of banana or plantain trees which had covered and adorned the land, scarcely one was left standing, either on the plains, in the valleys, or upon the mountains. Stately trees, that had withstood the storms of ages, were laid prostrate on the ground, and thrown upon each other in the wildest confusion; while even of those that were still standing, many were left without a branch, and all perfectly leafless. So great and so general was the destruction, that no spot escaped; for the gale, veering gradually round the island, did most effectually its devastating work.

Though the tropical storms are thus frequently a scourge, they are often productive of no less signal benefits. Many a murderous epidemic has suddenly ceased after one of these natural convulsions, and myriads of insects, the destroyers of the planter's hopes, are swept away by the fierce tornado. Besides, if the equatorial hurricanes are far more furious than our storms, a more luxurious vegetation effaces their vestiges in a shorter time. Thus Nature teaches us that a preponderance of good is frequently concealed behind the paroxysms of her apparently unbridled rage.

10<sup>1</sup>



SAVANNAH ON FIRE.

## CHAPTER II.

## THE LLANOS.

Their Aspect in the Dry Season—Vegetable Sources—Land Spouts—Effects of the Mirage—A Savannah on Fire—Opening of the Rainy Season—Miraculous Changes—Exuberance of Animal and Vegetable Life—Conflict between Horses and Electrical Eels—Beauty of the Llanos at the Termination of the Rainy Season—The Mauritia Palm.

IN South America, the features of Nature are traced on a gigantic scale. Mountains, forests, rivers, plains, there appear in far more colossal dimensions than in our part of the world. Many a branch of the Marañon surpasses the Danube in size. In the boundless primitive forests of Guiana more than one Great Britain could find room. The Alps would seem but of moderate elevation if placed aside of the towering Andes; and the plains of Northern Germany and Holland are utterly insignificant when compared with the Llanos of Venezuela and New Grenada, which, stretching from the coast-chain of Caraccas to the forests of Guiana, and from the snow-crowned mountains of Merida to the Delta of the Orinoco, cover a surface of more than 250,000 square miles.

Nothing can be more remarkable than the contrast which these immeasurable plains present at various seasons of the year—now parched by a long-continued drought, and now covered with the most luxuriant vegetation. When, day after day, the sun, rising and setting in a cloudless sky, pours, his vertical rays upon the thirsty Llanos, the calcined grass-plains present the monotonous aspect of an interminable waste. Like the ocean, their limits melt in the hazy distance with those of the horizon; but here the resemblance ceases, for no refreshing breeze wafts coolness over the desert, and comforts the drooping spirits of the wanderer.

In the wintry solitudes of Siberia the skin of the reindeer affords protection to man against the extreme cold ; but in these sultry plains there is no refuge from the burning sun above and the heat reflected from the glowing soil below, save where, at vast intervals, small clumps of the *Mauritia* palm afford a scanty shade. The water-pools which nourished this beneficent tree have long since disappeared ; and the marks of the previous rainy season, still visible on the tall reeds that spring from the marshy ground, serve only to mock the thirst of the exhausted traveller. The long-legged jabiru and the scarlet ibis have forsaken the dried-up swamp which no longer affords them any subsistence, and only here and there a solitary Caracara falcon lingers on the spot, as if meditating on the vicissitudes of the seasons.

Yet even now the parched savannah has some refreshment to bestow, as Nature—which in the East Indian forests fills



NEPENTHES.

the pitchers of the *Nepenthes* with a grateful liquid,—here also displays her bounty ; for the globular melon-cactus, which flourishes on the driest soil, and not seldom measures a foot in diameter, conceals a juicy pulp under its tough and brickly skin. Guided by an admirable instinct, the wary mule strikes off with his fore-feet the long, sharp thorns of this remarkable plant, the emblem of good-nature under a rough exterior, and then cautiously approaches his lips to sip the refresh-

ing juice. Yet, drinking from these living sources is not unattended with danger, and mules are often met with that have been lamed by the formidable prickles of the cactus. The wild horse and ox of the savannah, not gifted with the same sagacity, roam about a prey to hunger and burning thirst—the latter hoarsely bellowing, the former snuffing up the air with outstretched neck to discover by its moisture the neighbourhood of some pool that may have resisted the general drought.

Besides their interminable extent, the Llanos have several other points of resemblance to the sea. As here the water-spout,

raised by contending air-currents, rises to the clouds and sweeps over the floods, thus also the glowing dust of the savannah, set in motion by conflicting winds, ascends in mighty columns and glides over the desert plain. Then woe to the traveller who cannot escape by a timely flight; for, seizing him with irresistible violence the sand spout carries him along in its embrace, and hurls him senseless to the ground.

As if 'on a painted ocean,' the becalmed ship rests on the glassy sea. No breath of air ruffles the surface of the waters.

The pennant hangs lazily from the mast; the water-casks are empty; the torments of thirst, aggravated by the heat of a vertical sun, become intolerable. But, suddenly, as if by magic, a beautiful island rises from the floods; waving palm-trees seem to welcome the mariner: he fancies he hears the purling of the brook and the splashing of the waterfall. Yet still the vessel moves not from the spot, and soon the fading phantom that mocked his misery leaves him the victim of increased despair.

Similar delusions of the *mirage*, produced by the refraction of the light as it passes through atmospherical strata of unequal warmth, and consequently of unequal density, likewise take place over the surface of the Llanos, which then assume the semblance of a sea, heaving and rocking in wave-like motion. In the Lybian desert, in the dread solitudes of the polar ocean, in every zone, we meet with the same phenomenon, produced by the same cause.

As in the arctic regions the intense cold during winter retards the pulsations, or even suspends the operations of life, so in the Llanos the long continuance of drought causes a similar stagnation in animated nature. The thinly-scattered trees and shrubs do not indeed cast their foliage, but the greyish-yellow of their leaves announces that vegetation is suspended. Buried in the clay of the dried-up pools, the alligator and the water-boia lie plunged in a deep summer-sleep, like the bear of the north in his long winter slumber; and many animals which, at other times, are found roaming over the Llanos,—such as the graceful aguti, the hoggish peccary, and the timid deer of the savannah,—have left the parched plains and migrated to the forest or the river. The large maneless puma and the spotted jaguar, following their prey to less arid regions, are now no longer seen in their former hunting-grounds, and the Indian

has also disappeared with the stag whom he pursued with his poisoned arrows. In the Siberian Tundras the reindeer and the



AGUTI.



PECCARY.

migratory birds are scared away by winter ; here life is banished or suspended by an intolerable aridity.

Sometimes the ravages of fire complete the image of death on the parched savannah.

‘ We had not yet penetrated far into the plain,’ says Schomburgk, ‘ when we saw to the south-east high columns of smoke ascending to the skies, the sure signs of a savannah fire, and at the same time the Indians anxiously pressed us to speed on, as the burning torrent would most likely roll in our direction. Although at first we were inclined to consider their fears as exaggerated, yet the next half-hour served to convince us of the extreme peril of our situation. In whatever direction we gazed, we nowhere saw a darker patch in the grass-plain announcing the refuge of a water-pool ; we could already distinguish the flames of the advancing column, already hear the bursting and crackling of the reeds, when fortunately the sharp eye of the Indians discovered some small eminences before us, only sparingly covered with a low vegetation, and to these we now careered as if Death himself were behind us. Half a minute later, and I should never have lived to relate our adventures. With beating hearts we saw the sea of fire rolling its devouring billows towards us ; the suffocating smoke, striking in our faces, forced us to turn our backs upon the advancing conflagration, and to await the dreadful decision with the resignation of helpless despair.

‘ And now we were in the midst of the blaze. Two arms of fire encircled the base of the little hillock on which we stood, and united before us in a waving mass, which, rolling onwards,

receded farther and farther from our gaze. The flames had devoured the short grass of the hillock, but had not found sufficient nourishment for our destruction. Whole swarms of voracious vultures followed in circling flight the fiery column, like so many hungry jackals, and pounced upon the snakes and lizards which the blaze had stifled and half-calcined in its murderous embrace. When, with the rapidity of lightning, they darted upon their prey and disappeared in the clouds of smoke, it almost seemed as if they were voluntarily devoting themselves to a fiery death. Soon the deafening noise of the conflagration ceased, and the dense black clouds in the distance were the only signs that the fire was still proceeding on its devastating path over the wide wastes of the savannah.'

At length, after a long drought, when all Nature seems about to expire under the want of moisture, various signs announce the approach of the rainy season. The sky, instead of its brilliant blue, assumes a leaden tint, from the vapours which are beginning to condense. The black spot of the 'Southern Cross,' that most beautiful of constellations, in which, as the Indians poetically fancy, the Spirit of the savannah resides, becomes more indistinct as the transparency of the atmosphere diminishes. The mild phosphoric gleam of the Magellanic clouds expires. The fixed stars, which shone with a quiet planetary light, now twinkle even in the zenith. Like distant mountain-chains, banks of clouds begin to rise over the horizon, and accumulating in masses of increasing density, ascend higher and higher, until at length the lightning flashes from their dark bosom, and with the loud crash of thunder, the first rains burst in torrents over the thirsty land. Scarce have the showers had time to moisten the earth, when the dormant powers of vegetation begin to awaken with almost miraculous rapidity. The dull, tawny surface of the parched savannah changes as if by magic into a carpet of the liveliest green, enamelled with thousands of flowers of every colour. Stimulated by the light of early day, the mimosas expand their delicate foliage, and the fronds of the beautiful mauritias sprout forth with all the luxuriance of youthful energy.

And now, also, the animal life of the savannah awakens to the full enjoyment of existence. The horse and the ox rejoice in the grasses, under whose covert the jaguar frequently lurks,

to pounce upon them with his fatal spring. On the border of the swamps, the moist clay, slowly heaving, bursts asunder, and from the tomb in which he lay embedded rises a gigantic water-snake or a huge crocodile. The new-formed pools and lakes swarm with life, and a host of water-fowl—ibises, cranes, flamingos, mycterias—make their appearance, to regale on the prodigal banquet. A new creation of insects and other unbidden guests now seek the wretched hovels of the Indians, which are sparingly scattered over the higher parts of the savannah. Countless multitudes of ants, sandflies, and mosquitos; rattlesnakes, expelled by the cold and moisture from the lower grounds; repulsive geckos, which with incredible rapidity run along the overhanging rafters; nauseous toads, which, concealing themselves by day in the dark corners of the huts, crawl forth in the evening in quest of prey; lizards, scorpions, centipedes; in a word, worms and vermin of all names and forms,—emerge from the inundated plains, for the tropical rains have gradually converted the savannah, which erewhile exhibited a waste as dreary as that of the Sahara, into a boundless lake. The swollen rivers of the steppe—the Apure, the Arachuna, the Pajara, the Arauca—pour forth their mighty streams over the plains, and boats are now able to sail for miles across the land from one river-bed into another.

On the same spot where, erewhile, the thirsty horse anxiously snuffed the air to discover by its moisture the presence of some pool, the animal is now obliged to lead an amphibious life. The mares retreat with their foals to the higher banks, which rise like islands above the waters, and as from day to day the land contracts within narrower limits, the want of forage obliges them to swim about in quest of the grasses that raise their heads above the fermenting waters. Many foals are drowned; many are surprised by the crocodiles, that fell them by a stroke of their jagged tail, and then crush them between their jaws. Horses and oxen are not seldom met with, which, having fortunately escaped these huge saurians, bear on their limbs the marks of their sharp teeth.

‘This sight,’ says Humboldt, ‘involuntarily reminds the observer of the great pliability with which nature has endowed several plants and animals. Along with the fruits of Ceres, the horse and the ox have followed man over the whole earth, from

the Ganges to the La Plata, and from the coast of Africa to the mountain-plain of Antisana, which is more elevated than the lofty peak of Teneriffe. Here the northern birch-tree, there the date-palm, protects the tired ox from the heat of the mid-day sun. The same species of animal which contends in eastern Europe with bears and wolves, is attacked in another zone by the tiger and the crocodile.'

But it is not the jaguar and the alligator alone which lie in wait for the South American horse, for even among the fishes he has a dangerous enemy. The

rivers and marshes of the Llanos are often filled with electrical eels, which send forth at will from the under part of the tail a stunning



ELECTRICAL EEL.  
(GYMNOTUS ELECTRICUS.)

shock. These eels are from five to six feet long. They are able, when in full vigour, to kill the largest animals, when they suddenly unload their electrical organs in a favourable direction. Humboldt having accidentally set his foot on a gymnote which had just been taken out of the water felt the whole day severe pains in the knees and almost in every joint. Lizards, turtles, and frogs seek the morasses where they are safe from their discharges, and all other fishes, aware of their power, fly at the sight of the formidable gymnotes. They stun even the angler on the high river-bank, the moist line serving as a conductor for the electric fluid. The capture of these eels affords a highly entertaining and animated scene. Mules and horses are driven into the pond which the Indians surround, until the unwonted noise and splashing of the waters rouse the fishes to an attack. Gliding along, they creep under the belly of the horses, many of whom die from the shock of their strokes; while others, with mane erect, and dilated nostrils, endeavour to flee from the electric storm which they have roused. But the Indians, armed with long poles, drive them back again into the pool.

Gradually the unequal contest subsides. Like spent thunder-clouds, the exhausted fishes disperse, for they require a long rest and plentiful food to repair the loss of their galvanic powers. Their shocks grow weaker and weaker. Terrified by the noise of the horses, they timidly approach the banks, when, wounded with harpoons, they are dragged on shore with dry and non-conducting pieces of wood; and thus the strange combat ends.

The Llanos are never more beautiful than at the end of the rainy season, before the sun has absorbed the moisture of the soil. Then every plant is robed with the freshest green; an agreeable breeze, cooled by the evaporating waters, undulates over the sea of grasses, and at night a host of stars shines mildly upon the fragrant savannah, or the silvery moonbeam trembles on its surface. Where on the margin of the primitive forest, girt with colossal cactuses and agaves, groups of the mauritia rise majestically over the plain, the stateliest park ever planted by man must yield in beauty to the charming picture of these natural gardens, bordered here by impenetrable thickets, and there by the blue mountain-chain, behind which the fancy paints scenes of still more enchanting loveliness.

The mauritia, the chief ornament of the park-like savannah, and no less useful than the date-tree of the African oasis, provides the Indian with almost every necessary, and fully deserves the name of 'tree of life,' bestowed upon it by the poetical fancy of the Jesuit Gumilla. Rising to the height of a hundred feet, its slender trunk is surmounted by a magnificent tuft of large, fan-shaped fronds, of a brilliant green, under whose canopy the scaly fruits, resembling pine cones, hang in large clusters. Like the banana, they afford a food differing in taste according to the stages of ripeness in which they are plucked; and before the blossoms of the male palm have expanded, its trunk contains a nutritious pith like sago, which, dried in thin slices, forms one of the chief articles of the Indian's bill of fare. Like his brethren of the Eastern world, he also knows how to prepare an intoxicating 'toddy' from the juice of the flower-spines; the leaves serve to cover his hut; out of the fibres of their petioles he manufactures twine and cordage; and the sheaths at their base afford him material for his sandals.

At the mouth of the Orinoco the very existence of the yet unsubdued Guaranas depends on the mauritia, which gives them both food and liberty. Formerly, when this tribe was more numerous than at the present day, they raised their huts on floorings stretched from trunk to trunk, and formed of the leaf-stalks of their tutelary palm. Thus, like the monkeys and parrots of their native wilds, they lived in the trees during the inundations of the Delta in the rainy season. These platforms

were partly covered with moist clay, on which fire was made for household purposes; and the flames afforded a strange sight to travellers sailing on the river at night. Even now the light-footed Guaranas owe their independence to the marshy nature of their territory, and to their arboreal life.

The fruits of the mauritia, besides affording food to the Indian, are eagerly devoured by monkeys and parrots. On approaching a group of palms at the time when the fruits are ripening, the profound silence which within the tropics chiefly characterises the noon, is interrupted by a scream of warning, and soon after a numerous troop of birds wheels screeching about the grove.

When the Spaniards first settled in the beautiful mountain valleys of Caraccas and on the Orinoco, they found the Llanos, in spite of their abundant verdure, almost entirely uninhabited by man, for the Indians were unacquainted with pastoral life; and if the mauritia had not here and there tempted a few savages to settle on the open savannahs, they would have been left entirely to the animal life which from time immemorial had thriven on their herbage. But the Spaniards introduced new quadrupeds into the new world,—the ox, the horse, the ass, our faithful companions over the whole surface of the globe,—and the progeny of these domestic animals, returning to their wild state, has multiplied amazingly in the vast pastures of the Llanos. Man has followed them into their new domain; and small hamlets, often situated whole days' journeys one from another, and consisting only of a few wretched huts, though generally dignified with the name of towns, proclaim that he has at least made a beginning to establish his empire over these boundless plains.



HIGH TABLE-LANDS OF PERU.

### CHAPTER III.

#### THE PUNA, OR THE HIGH TABLE-LANDS OF PERU AND BOLIVIA.

Striking Contrast with the Llanos—Northern Character of their Climate—The Chuñu—The Surumpe—The Veta: its Influence upon Man, Horses, Mules, and Cats—The Vegetation of the Puna—The Maca—The Llama: its invaluable Services—The Huanacu—The Alpaca—The Vicuñas: Mode of Hunting Them—The Chacu—The Bolas—The Chinchilla—The Condor—Wild Bulls and Wild Dogs—Lovely Mountain Valleys.

**B**ETWEEN the two mighty parallel mountain chains of the Cordillera and the Andes,\* the giant bulwarks of Western South America, we find, extending throughout the whole length of Peru and Bolivia, at a height of from ten to fourteen thousand feet above the level of the sea, vast plateaus, or table-lands, which are named, in the language of the country, the *Puna*, or 'the Uninhabited.' They present a striking contrast to the Llanos of Venezuela; for though situated, like these sultry plains, within the torrid zone, their great elevation paralyses the effects of a vertical sun, and transfers the rigours of the north to the very centre of the tropical world.

\* Though frequently confounded, even by the Peruvian Creoles, the western chain, running parallel with the coast of the Pacific, is properly the Cordillera while the eastern chain, which generally runs in the same direction as the former, has always been named the Andes by the Indian natives.

Their climate is hardly less bleak and winterly than that of the high snow-ridges which bound them on either side. Cold winds sweep almost constantly over their surface, and during four months of the year they are daily visited by fearful storms. The suddenly darkened sky discharges, under terrific thunder and lightning, enormous masses of snow, until the sun breaks forth again. But soon the clouds obscure its brilliancy; and thus winter and summer, here reign alternately,—not, as in our temperate climes, during several months, but within the short space of a single day. In a few hours the change of temperature often amounts to forty or forty-five degrees, and the sudden fall of the thermometer is rendered still more disagreeable to the traveller by biting winds, which so violently irritate the skin of the hands and face, that it springs open and bleeds from every fissure. An intolerable burning and swelling accompany these wounds, so as to prevent the use of the hands for several days. On the lips it is also very disagreeable, as the pain increases by eating and speaking; and an incautious laugh produces deep rents, which bleed for a long time and heal with difficulty.

This evil, which is called *Chuñu* by the Peruvian Indians, is also very painful on the eyelids; but it becomes absolutely insupportable by the addition of the *Surumpe*, a very acute and violent inflammation of the eyes, caused by the sun's reflection from the snow. In consequence of the rarefied air and the biting winds, the visual organs are constantly in a state of irritation, which renders them far more sensitive to any strong light than would be the case in a more congenial atmosphere. The rapid change from a clouded sky to the brilliancy of a sunny snow-field, causes a painful stinging and burning, which increases from minute to minute to such a degree, that even the stoical Indian, when afflicted with this evil, will sit down on the road-side and utter cries of anguish and despair. Chronical ophthalmia, suppuration of the eyelids, and total blindness, are the frequent consequences of an intense surumpe, against which the traveller over the high lands carefully guards himself by green spectacles or a dark veil.

A third plague of the wanderer in the Puna is the *Veta*, which is occasioned by the great rarefaction of the air. Its first symptoms, which generally appear at an elevation of 12,000

feet, consist in giddiness, buzzing in the ear, headache, and nausea. Their intensity increases with the elevation, and is aggravated by a lassitude, which augments to such a degree as to render walking impossible, by a great difficulty of respiration, and violent palpitation of the heart. Absolute rest mitigates these symptoms; but on continuing the journey they reappear with increased violence, and are then frequently accompanied by fainting and vomiting. The capillary vessels of the eye, nose, and lips burst, and emit drops of blood. The same phenomenon appears also in the mucous membrane of the respiratory and digestive organs; so that blood-spitting and bloody diarrhœa frequently accompany the Veta, and are sometimes so violent as to cause death.

The influence of diminished atmospheric pressure likewise shows itself in the horses that are unaccustomed to mountain travelling. They begin to pace more slowly, frequently stand still, tremble all over, and fall upon the ground. If not allowed to rest, they invariably die. By way of a restorative their nostrils are slit open, which seems to be of use by allowing a greater influx of air.

As the dry sand of the rainless coast prevents the putrefaction of animal substances which are buried in it, the power of the dry Puna-winds in a like manner arrests the progress of decomposition. Under their influence, a dead mule changes in a few days into a mummy, so that even the entrails do not exhibit the least sign of putrefaction.

It may easily be imagined that, under these circumstances, vegetation can only appear in stunted proportions, and indeed the Puna presents the monotonous aspect of a northern steppe, its whole surface being covered with dun and meagre herbage, which at all times gives it an autumnal or even wintry aspect. A few arid compositæ and yellow echinocacti are quite unable to relieve the dreary landscape; and even the large-flowered calceolarias, the blue gentians, the sweet-smelling verbenas, and many other Alpine plants, the usual ornaments of the higher mountain regions, are here almost suffocated by the dense grasses. But rarely the eye meets with a solitary queñua tree (*Polylepis racemosa*) of crippled growth, or with large spaces covered with red-brown ratania shrubs, which are carefully collected for fuel, or for roofing the wretched huts of the scanty population of these desolate highlands.

The cold climate of the Puna naturally confines agriculture to very narrow limits. The only cultivated plant which grows to maturity is the Maca (a species of *tropæolum*), the tuberous roots of which are used like the potato, and form in many parts the chief food of the inhabitants. This plant grows best at an elevation of twelve or thirteen thousand feet, and is not planted in the lower regions, where its roots are said to be completely unpalatable. Barley is also cultivated in the Puna, but never ripens, and is cut green for forage.

The animal kingdom is more amply represented; for there is no want of food on the grass-covered plains, and wherever this exists, there is room for the development of animals appropriate to the climate.

Thus the *Llama* and its near relations, the *Alpaca*, the *Huanacu*, and the *Vicuña*, the largest four-footed animals which Peru possessed before the Spaniards introduced the horse and the ox, are all natives of the Puna. Long before the invasion of Pizarro, the llama was used by the ancient Peruvians as a beast of burthen, and was not less serviceable to them than the camel to the Arabs of the desert. The wool served for the fabrication of a coarse cloth; the milk



THE LLAMA.

and flesh, as food; the skin, as a warm covering or mantle; and without the assistance of the llama, it would have been impossible for the Indians to transport goods or provisions over the high table-lands of the Andes, or for the Incas to have founded and maintained their vast empire. The llama is also historically remarkable as being the only animal domesticated by the aboriginal Americans. The reindeer of the north\* and the bison of the prairies enjoyed then, as they do now, their savage independence: the llama alone was obliged to submit to the yoke of man. But the llama reminds us of the dromedary not only by a similar destiny and similar services, but also by a strong resemblance in form and structure, so as to be classed by naturalists in the same family. The unsightly hump is wanting, but the llama possesses the same callosities on the breast and

\* It is only in the Old World that the reindeer has ever been domesticated.

on the knees, the same divided hoof and a similar formation of the toes and stomach. Thus Nature has formed in the llama a species of mountain camel, admirably adapted to the exigencies of a totally different soil and climate; and surely it is not one of the least wonders of creation to see animals so similar in many respects emerge, without any connecting links, at the opposite extremities of the globe.

The ordinary load of the llama is about one hundred pounds, and its rate of travelling with this burthen over rugged mountain passes is from twelve to fifteen miles a-day. When overloaded it lies down, and will not rise until relieved of part of its burthen. 'The Indians,' says Tschudi, 'often travel with large herds of llamas to the coast to fetch salt. Their journeys are very small, rarely more than three or four leagues; for the llamas never feed after sunset, and are thus obliged to graze while journeying, or to rest for several hours. While reposing they utter a peculiar low tone, which at a distance resembles the sound of an Æolian harp. A loaded herd of llamas traversing the high table-lands affords an interesting spectacle. Slowly and stately they proceed, casting inquisitive glances on every side. On seeing any strange object which excites their fears, they immediately scatter in every direction, and their poor drivers have great difficulty to gather the herd.' The Indians, who are very fond of these animals, decorate their ears with ribbons, hang little bells about their necks, and always caress them before placing the burthen on their back. When one of them drops from fatigue, they kneel at its side and strive to encourage it for further exertion by a profusion of flattering epithets and gentle warnings. Yet, in spite of good treatment, a number of llamas perish on the way to the coast or to the forests, as they cannot stand the hot climate.

The *Huanacu* is of a greater size than the llama, and resembles it so much that it was supposed to be the wild variety until Tschudi, in his 'Fauna Peruana,' pointed out the specific differences between both. Its fleece is shorter and less fine; its colour brown, the under parts being whitish—but varieties of colour are never observed, as in the llama; the face is blackish grey, lighter and almost white about the lips. The huanacus generally live in small troops of from five to seven. They are very shy, but when caught young are easily tamed, though they

always remain spiteful, and can hardly ever be trained to carry burthens.

The *Alpaca* is smaller than the llama, and resembles the sheep; but its neck is longer, and it has a more elegantly formed head. The wool which, on account of its admirable qualities, is extensively used in England, is very long, soft, fine, and of a silky lustre—sometimes quite white or black, but often also variegated.



THE ALPACA.

Shy, like the chamois or the steinbock, the *Vicuña* inhabits the most sequestered mountain-valleys of the Andes. It is of a more elegant shape than the alpaca, with a longer and more graceful neck, and a more curly wool of extreme fineness. During the rainy season, the vicuñas retire to the crests of the Cordillera, where vegetation is reduced to the scantiest limits; but they never venture on the bare summits, as their hoof, accustomed to tread only on the turf, is very tender and sensitive. When pursued, they never fly to the ice-fields, but only along the grass-grown slopes. In the dry season, when vegetation withers on the heights, they descend to seek their food along the sources and swampy grounds. From six to fifteen shevicuñas live under the protection and guidance of a single male, who always remains a few paces apart from his harem, and keeps watch with the most attentive care. At the least approach of danger he immediately gives the alarm by a shrill cry, and rapidly steps forward. The herd, immediately assembling, turns inquisitively towards the side whence danger is apprehended, and then, suddenly wheeling, flies, at first slowly, and constantly looking back, but soon with unrivalled swift-ness. The male covers the retreat, frequently standing still and watching the enemy. The females reward the faithful care of their leader with an equally rare attachment; for when he is wounded or killed, they will keep running round him with shrill notes of sorrow, and rather be shot than flee. The cry of the vicuña is a peculiar whistle, which, though greatly resembling the shrill neighing of the llama, may easily be distinguished by a practised ear, when it suddenly pierces the thin air of the Puna, even from a distance where the sharpest eye is no longer able to distinguish the form of the animal.

The hunting of the vicuñas, which is very singular and interesting, takes place in April or May. Each family in the Puna villages is obliged to furnish the contingent of one of its members at least; and the widows accompany the hunters, to serve as cooks. The whole troop, frequently consisting of seventy or eighty persons, and carrying bundles of poles and large quantities of cordage, sets out for the more elevated plateaus, where the vicuñas are grazing. In an appropriate spot the poles are fixed into the earth, at intervals of twelve or fifteen paces, and united by the cordage, about two feet from the ground. In this manner a circular space, called *Chacu*, of about half a league in circumference, is enclosed, leaving on one side an entrance several hundred paces wide. The women attach to the cordage coloured rags, which wave to and fro in the wind. As soon as the *Chacu* is ready, the men disperse, and forming a ring many miles in circumference, drive all the intervening vicuña herds through the entrance into the circle, which is closed as soon as a sufficient number has been collected. The shy animals do not venture to spring over the cord and its fluttering rags, and are thus easily killed by the bolas of the Indians. These bolas consist of three balls of lead or stone, two of which are heavy, and one lighter, each ball being attached to a long leather thong. The thongs are knotted together at their free extremity. When used, the lighter ball is taken in the hand, and the two others swung in a wide circle over the head. At a certain distance from the mark, about fifteen or twenty paces, the hand-ball is let loose, and then all three fly in hissing circles towards the object which they are intended to strike, and encompass it in their formidable embrace. The hindlegs of the vicuñas are generally aimed at. It is no easy matter to throw the bolas adroitly, particularly when on horseback; for the novice often wounds either himself or his horse mortally, by not giving the balls the proper swing, or letting them escape too soon from his hand. The flesh of the vicuñas is divided in equal portions among the hunters. When dried in the air, and then pounded and mixed with Spanish pepper, its taste is not displeasing. The Church, however, manages to get the best part of the animal, for the priest generally appropriates the skin. As soon as all the entrapped vicuñas are killed, the *chacu* is taken to

pieces, and set up again ten or twelve miles further off. The whole chase lasts a week, and the number of the animals slaughtered frequently amounts to several hundreds.

In the times of the Incas, the Puna chases were conducted on a much grander scale. Annually from 25,000 to 30,000 Indians assembled, who were obliged to drive all the wild animals from a circuit of more than a hundred miles into an enormous chacu. As the circle narrowed, the ranks of the Indians were doubled and trebled, so that no animal could escape. The pernicious quadrupeds, such as bears, cuguars, and foxes, were all killed, but only a limited number of stags, deer, vicuñas, and huanacus; for the provident Incas did not lose sight of the wants of futurity, and were more economical of the lives of animals than their brutal successors, the Christian Spaniards, were of the lives of men.

In spite of the persecutions to which they are subject, not only from hunters but from the ravenous condor, who frequently robs them of their young, the vicuñas do not seem to diminish, and are often seen roaming about in large numbers—the inaccessible wilds to which they are able to retreat amply securing them against extermination.

Besides these four remarkable Camelides, we find among the animals peculiar to the Puna the stag-like Tarush (*Cervus antisiensis*); the timid deer, who also descends from the high mountain-plains into the coast-valleys and the forest region; the Viscachas and the Chinchillas. The Peruvian Viscachas (*Lagidium peruanum* and *pallipes*), live at an elevation of from 10,000 to 12,000 feet, between 33° and 18° S. lat., and resemble the rabbit in form and colour, but have shorter ears and a long rough tail. Their fur is soft, but not nearly so fine as that of the near-



CHINCHILLA.

related Chinchilla (*Chinchilla lanigera*). This little creature, which is somewhat larger than our squirrel, has large and brilliant eyes, an erect tail, strong bristles on the upper lip, and almost naked, rounded ears. It lives in bur-

rows, feeding chiefly upon roots, and is found in such numbers in the Chilian Andes that its holes considerably increase the difficulty of travelling. The fur is too well known to require

any further description. Where ruminants and rodents abound it may easily be imagined that beasts of prey will not be wanting. The cunning fox (*Canis Azaræ*) waylays both the chinchillas and the water-birds; and, impelled by hunger, the Puma, or American lion, ascends even to the borders of eternal snow in quest of the vicuña and the deer. But the monarch of the Puna is unquestionably the mighty condor, who, soaring over the highest peaks of the Andes, sees on one side the Pacific rolling its heavy breakers against the coast, and on the other the Marañon vanishing in the hazy distance of the primitive forest.

The frequent showers and snow-falls of the Puna naturally give rise to numerous swamps and lagunes, which afford nourishment to an abundance of birds,—such as the beautiful snow-white Huachua goose (*Chloéphaga melanoptera*), with dark-green wings of a metallic lustre; the lieli, a species of plover; the ibis; the long-legged flamingo; the Quiulla gull (*Larus serranus*), and the gigantic coot (*Fulica gigantea*), which, unable to fly, dives in the cold waters, and builds its nest on the solitary stones which rise above the surface.

To the aboriginal animals of the Puna man has added the horse, the ox, the dog, and the sheep. In the more sheltered valleys there are estates possessing from 60,000 to 80,000 sheep, and from 400 to 500 oxen. During the wet season the herds are driven into the Altos or highest regions, often to a height of 15,000 feet; but when the frosty nights of the dry period of the year parch the grass, they are obliged to descend to the swampy valleys, where they have much to suffer from hunger. In many parts of the Puna, wild bulls render travelling very dangerous, as they sometimes rush upon man without any previous notice, though they generally announce their approach by a hoarse bellowing. But even then it is almost impossible to escape them in the open plain, and more than once Tschudi was only able, by a well-aimed shot, to save himself from the attack of one of these formidable animals.

Though not so dangerous, the half-wild Puna dogs (*Canis Ingæ*, Tschudi) are extremely troublesome to the traveller,—false, spiteful animals, which ferociously attack enemies far stronger than themselves; and, like the bull-dog, will rather suffer themselves to be cut to pieces than retreat. They have a

particular antipathy to the white race, and it is rather a bold undertaking for the European traveller to approach the hut of an Indian that is guarded by these animals.

The frosts of winter and an eternal spring are nowhere found in closer proximity than in the Peruvian highlands, for deep valleys cleave the windy Puna; and when the traveller, benumbed by the cold blasts of the mountain-plains, descends into these sheltered gorges he almost suddenly finds himself transported from a northern climate to a terrestrial paradise. Situated at a height where the enervating power of the tropical sun is not felt, and where at the same time the air is not too rarefied, these pleasant mountain vales, protected by their rocky walls against the gusts of the Puna, enjoy all the advantages of a genial sky. Here the astonished European sees himself surrounded by the rich corn-fields, the green lucerne meadows, and the well-known fruit trees of his distant home, so that he might almost fancy that some friendly enchanter had transported him to his native country, if the cactuses and the agaves on the mountain-slopes by day, and the constellations of another hemisphere by night, did not remind him of the vast distance which separates him from the land of his birth.

There are regions in this remarkable country where the traveller may in the morning leave the snow-decked Puna hut, and before sunset pluck pine-apples and bananas on the cultivated margin of the primeval forest; where in the morning the stunted grasses and arid lichens of the naked plain remind him of the arctic regions, and where he may repose at night under the fronds of gigantic palms.



GUANO ISLAND.

## CHAPTER IV.

### THE PERUVIAN SAND-COAST.

Its desolate Character—The Mule is here the 'Ship of the Desert.'—A Shipwreck and its Consequences—Sand-Spouts—Medanos—Summer and Winter—The Garuas—The Lomas—Change produced in their Appearance during the Season of Mists—Azara's Fox—Wild Animals—Birds—Reptiles—The Chincha or Guano Islands.

**B**ETWEEN the Cordilleras to the east and the Pacific to the west extends, from  $3^{\circ}$  to  $21^{\circ}$  S. lat., 540 leagues long and from 3 to 20 leagues broad, a desert coast, the picture of death and desolation. Traversed by spurs of the mighty mountain-chain, which either gradually sink into the plain, or form steep promontories washed by the ocean, it rises and falls in alternate heights and valleys, where the eye seldom sees anything but fine drift-sand or sterile heaps of stone.

Only where, at considerable intervals, some rivulet, fed by a glacier or a small mountain lake, issues from the ravines of the Andes to lose itself after a short course in the Pacific, green belts, like the oases of the African desert, break the general monotony, and appear more charming from the contrast with the nakedness of the surrounding waste. The planter carefully husbands the last drop of water from those scanty streams; for, as the tribes

of the Sahara can only, by dint of constant industry, preserve their date-palm islands against the waves of the surrounding sand-sea, thus also the inhabitant of the Peruvian coast can only by perpetual irrigation protect his plantations from the encroachments of the neighbouring desert! But the fruits which he reaps and garners are very different from those which are produced by the African oasis; for, while none of the plants of the Peruvian sand-coast has ever found its way to the Sahara, the sycamores and tamarinds of the latter are equally unknown on the eastern shores of the Pacific. Cotton and sugar, maize and batatas, manioc and bananas, here take the place of the date-palm of the Arab, and thrive only so far as the limits of irrigation extend.

In the surrounding wastes, where for miles and miles the traveller meets no traces of vegetation, and finds not one drop of water, the mule performs the part of the African camel; for, satisfied with a scantier food than the horse, it more easily supports the fatigues of a prolonged journey through the sand, and in Peru is fully entitled to be called the *ship of the desert*. The horse cannot support hunger and thirst longer than forty-eight hours without becoming so weak as hardly to be able to carry its rider; and if the latter is imprudent enough to urge it on to a more rapid pace, it falls a victim to his obstinacy, as it will obey the spur until it sinks never to rise again. Not so the mule, which, on feeling itself unable to advance, stands still, and will not move an inch until it has rested for a time; after which it willingly continues its journey. Yet, in spite of these excellent qualities, many mules succumb to the fatigues and privations of the desert; and as in the Sahara the caravan-routes are marked by camel-skeletons, so here long rows of mule-skulls and bones point out the road along the Peruvian sand-coast. Woe to him whom a shipwreck casts on these desolate shores; for he is almost inevitably doomed to destruction!

In general, a healthy man can withstand hunger and thirst during four or five days, but only in a temperate climate and when the body is at rest; while in the burning deserts of Peru, the want of water during forty-eight hours, combined with the fatigue of wading through the deep sands, can only end in death. Thirst can, undoubtedly, be supported ten times longer in the moist sea-air than in the thoroughly desiccated atmosphere of a tropical waste.

The dangers of these solitudes are increased by the great mobility of the soil. When a strong wind blows, huge sand-columns, rising like water-spouts to a height of eighty or a hundred feet, advance whirling through the desert, and suddenly encompass the traveller, who can only save himself by a rapid flight. Such is the instability of the soil, that in a few hours a plain will be covered with hillocks or *Medanos*, and recover after a few days its former level. The most experienced mule-teers are thus constantly deceived in their knowledge of the road, and are the first to give way to despair, while seeking to extricate themselves from a labyrinth of newly-formed medanos. These constant transformations and shiftings in the desert, which Tschudi graphically calls 'a life in death,' take place more particularly in the hot season, when the least pressure of the atmosphere suffices to disturb the dried-up sands, whose weight increases during the winter by the absorption of moisture. The single grains then unite to larger masses, and more easily withstand the pressure of the wind.

The summer, or dry season, begins in November. The rays of the vertical sun strike upon the light-coloured sands, and are reflected with suffocating power. No plant except the cactuses and tillandsias, which manage to thrive where nothing else exists, takes root in the glowing soil; no animal finds food on the lifeless plain; no bird, no insect, hovers or buzzes in the stifling atmosphere. Only in the highest regions the condor, the monarch of the air, is seen sailing along in lonely majesty.

In May, which in these southern latitudes corresponds to our October, the scene changes. A thin, misty veil extends over the sea and the coast, and, increasing in density during the following months, only begins to diminish in October. At the beginning and the end of this damp season the mist generally ascends between nine and ten in the morning, and falls again at about three in the afternoon; but in August and September, when it is most dense, it rests for weeks immovably over the earth, never dissolving in rain, but merely descending in a fine, penetrating drizzle, called 'garua' by the inhabitants. In many parts rain has not been known to fall for centuries, except only after very severe earthquakes, and even then the phenomenon is not of constant occurrence. The mist seldom ascends to a vertical height of more than 1,200 feet, when it is replaced by violent

showers of rain ; and, remarkably enough, the limits between both can be determined with almost mathematical precision, as there are plantations, one half of whose surface is invariably moistened by garuas and the other by rain.

When the mists appear, the Lomas, or chains of hills which bound the sand-coast towards the east, begin to assume a new character ; and, as if by magic, a garden is seen where but a few days before a desert extended its dreary nakedness. Soon also, animal life begins to animate the scene, as the Lomeros drive their cattle and horses to these newly-formed pasture-grounds, where for several months they find an abundance of juicy food, but no water. This, however, they do not require, as they always leave the Lomas in the best condition.

In some of the northern coast-districts, situated near the equatorial line, where the garuas seldom appear, the fertility of the land depends wholly upon the streams which issue from the mountains. The dew, which along the coasts of central and south Peru hardly moistens the soil to the depth of half an inch, is there so completely wanting, that a piece of paper exposed to the air during the night shows no sign of moisture in the morning ; and so thoroughly does the dryness of the soil prevent putrefaction, that after 300 years the mummified corpses are still found unaltered, which the ancient Peruvians buried in a sitting posture.

Thus the aridity of the Sahara repeats itself in these American deserts, and is in some measure owing to the same cause, though their geographical position to the west of the Andes, whose eastern slopes absorb all the moisture of the prevailing trade-winds, chiefly accounts for their nakedness. Rain is wanting, as there is no vegetation of any great extent to condense the passing vapours ; and, on the other hand, the want of moisture prevents plants from rooting on the unstable soil.

A glance at the animal world of the Peruvian coast shows us the same poverty of species as in the great African desert. A fox (*Canis Azaræ*) seems here to play the part of the hyæna and the jackal ; and is found both in the cotton-plantations along the streams, and in the Lomas, where he is destructive to the young lambs. The large American felidæ, the puma, and the jaguar, seldom appear on the coast, where they attain a more considerable size than in the mountains. The cowardly

puma is afraid of man ; while the bloodthirsty jaguar penetrates into the plantations, where he lies in wait for the oxen and horses, and avoids with remarkable sagacity, the manifold traps and pitfalls that are laid for him by the hacienaderos.

In the cultivated districts Opossums are found among the low bushes, in deserted dwellings, or in storerooms ; armadillos (*Dasypus tatuay*) are sometimes shot in the fields, and wild hogs of an enormous size infest the thickets near some of the plantations.



OPOSSUM.

Instead of the antelope and the gazelle of the African deserts, the Venado, a species of deer, makes its appearance on the Peruvian coast. It chiefly lives in the low bushes, which are scattered here and there, and after sunset visits the cultivated fields where it causes considerable damage.

Besides the numerous sea- and strand-birds, the carrion vultures and the condor, often found in large numbers feasting upon the marine animals that have been cast ashore, are the most conspicuous among the feathered tribes of the coast. A small falcon (*Falco sparverius*) is likewise often seen, and a small burrowing owl (*Athene cunicularia*) haunts almost every ruinous building. The pearl-owl (*Strix perlata*), performing the useful services of our own barn-owl, is protected and encouraged in many plantations, as it thins the ranks of the mice. Swallows are scarce ; nor do they build their nests on the houses, but on solitary walls, far from the habitations of man.

Among the singing birds, the beautiful crowned fly-catcher (*Myiarchus coronatus*) is one of the most remarkable. Its head, breast and belly are of a burning red ; its wings and back blackish brown. It always sits upon the highest top of the bushes, flies vertically upwards, whirls about a short time singing in the air, and then again descends in a straight line upon its former resting-place. Some tanagras and parrots, and two starling-like birds, the red-breasted picho and the lustrous black chivillo, that are frequently kept in cages on account of their agreeable song, are found in the coast-valleys ; and various pigeons, among others the neat little turtuli and the more stately cuculi, frequent the neighbourhood of the plantations.

Among the lizard tribes large and brilliantly green iguanas are found on the southern coast; but much more frequently dull and sombre agamas lurk among the rocks and stones. Snakes, both venomous and harmless, are in general tolerably rare, and occur both in the fruitful lands and the sand-plains.

The animated sea-shore forms a striking contrast to the death-like solitude of the interior. Troops of carrion vultures gather about the large marine animals cast ashore by the surf; numerous strand-birds are greedily on the look-out for the shell-fish left by the retreating tide, or for the crabs and sea-spiders that everywhere draw their furrows about the beach; and sea-otters and seals sun themselves on the cliffs along the whole coast, except in the neighbourhood of the seaports where they have been extirpated or driven away by incessant persecutions.

To the north of Chancay, steep sand-hills rise to the height of 300 or 400 feet, abruptly verging to the sea. The road leading along the side of these hills, would be extremely dangerous but for the unstable nature of the soil. For though at each false step the mule slides with his rider towards the sea, it is very easy for him to regain his footing on the yielding sand. A large stone on one of these hills bears a striking resemblance to a sleeping sea-lion, and almost perpendicularly beneath it lies a little cove, inhabited by a number of seals. At night the bark of these animals, mixing with the hollow roar of the breakers, fills the traveller with a kind of involuntary terror.

Myriads of sea-birds breed on the small islands along the coast or swarm about the bays, where the fish supply them with abundant food. The number of these birds, a matter formerly of only local interest, is now a subject of general importance, as to them are owing the deep guano beds which have converted the sterile Chincha Islands \* into mines of wealth.

The want of rain, which renders the greatest part of the Peruvian coast so utterly barren, is of the utmost advantage for the production of the guano; for if the Chincha Islands, like the Orkneys or the Hebrides, had been exposed to frequent storms, or washed by unceasing showers, they would have been mere naked rocks, instead of affording the richest deposits of manure the world can boast of.

\* For a more detailed account of the Peruvian Guano Islands, see 'The Sea and its Living Wonders.' Second Edition, pp. 144, 147.

## CHAPTER V.

## THE AMAZONS, THE GIANT RIVER OF THE TORRID ZONE.

The Course of the Amazons and its Tributaries—The Strait of Obydos—Tide Waves on the Amazons—The Black-water rivers—The Rio Negro—The Bay of the Thousand Isles—The Pororocca—Rise of the River—The Gapo—Magnificent Scenery—Different Character of the Forests beyond and within the verge of Inundation—General Character of the Banks—A Sail on the Amazons—A Night's Encampment—The 'Mother of the Waters'—The Piranga—Dangers of Navigating on the Amazons—Terrific Storms—Rapids and Whirlpools—The Stream of the Future—Travels of Orellana—Madame Godin.

**T**HE Amazons, the giant stream of the tropical world, is of no less magnificent proportions than the Andes, where it takes its source. From the small Peruvian mountain-lake of Lauricocha, 12,500 feet above the sea, the Tunguragua, which is generally considered as the chief branch, rushes down the valleys. At Tomepanda, in the province of Juan de Bracamoros, rafts first begin to burden its free waters; but, as if impatient of the yoke, it still throws many an obstacle in the navigator's way; for twenty-seven rapids and cataracts follow each other as far as the Pongo de Manseriche, where, at the height of 1,164 feet above the level of the sea, it for ever bids adieu to the romance of mountain scenery.

Its width, which at Tomepanda exceeds that of the Thames at Westminster Bridge, narrows to 150 feet in the defile of the Pongo, which in some places is obscured by overhanging rocks and trees, and where huge masses of drift-wood, torn from the slopes by the mountain torrents, are crushed and disappear in the vortex.

From the Pongo to the ocean, a distance of more than 2,000 miles, no rocky barrier impedes the further course of the monarch of streams; and according to Herndon (Exploration of the Valley of the Amazons, 1851-1853), its depth constantly

remains above eighteen feet, so that it is navigable for large ships all the way from Para to the foot of the Andes! No other river runs in so deep a channel at so great a distance from its mouth, and the tropical rains, spreading over a territory nearly equal in extent to one-half of Europe, are alone able to feed a stream of such colossal dimensions!

The first considerable tributary of the Amazons is the Hualaga, which rises near the famous silver-mines of Cerro de Pasco, 8,600 feet above the level of the sea, and is 2,500 paces broad at the point where the rivers meet. Lower down at Nauta, the Ucayale, descending from the distant mountains of Cuzco, adds his waters to the growing stream, after a course nearly 400 miles longer than that of the Tunguragua itself. Where these mighty rivers meet, Lieutenant Lister Maw found a depth of thirty-five fathoms.

From the Brazilian frontier, where it still flows at an elevation of 630 feet above the sea, to the influx of the Rio Negro, the Amazons is called the Solimoens, as if one name were not sufficient for its grandeur. During its progress between these two points it receives on the left, the Iça and the Yapura, on the right, the Xavari, the Jutay, the Jurua, the Teffe, the Coary, and the Purus, streams which, in Europe, would only be equalled by the Danube, but are here merely the obscure branches of a giant trunk.

The Rio Negro is the most considerable northern vassal of the Amazons. It rises in the Sierra Tunuhy, an isolated mountain-group in the Llanos, and conveys part of the waters of the Orinoco to the Amazons, as if the latter were not already sufficiently great. After a course of 1,500 miles it flows into the vast stream, 3,600 paces broad and 19 fathoms deep. Brigs of war have already ascended the Amazons as far as the Rio Negro, and frigates would find no obstacle in their way.

The Madeira, the next great tributary of the regal stream, has thus been named from the vast quantities of drift-wood floating on its waters.

Farther on, after having with a side-arm embraced the island of Tupinambaranas, which almost equals Yorkshire in extent, the Amazons now reaches the strait of Obydos, where it narrows to 2,126 paces, and rolls along between low banks in a bed whose depth as yet no plummet hath sounded. The mass of

waters which, during the rainy season, rushes in one second through the strait, is estimated by Von Martius at 500,000 cubic feet,—enough to fill all the streams of Europe with an exuberant current.

The tides extend as far as Obydos, though still 400 miles from the sea; and according to La Condamine, they are even perceptible as far as the confluence of the Madeira. But so slow is their progress upwards, that seven floods, with their intervening ebbs, roll simultaneously along upon the giant stream; and thus, four days after the tide-wave was first raised in the wide deserts of the South Sea, its last undulations expire in the solitudes of Brazil.\*

The next considerable vassal of the Amazons is the shallow Tapajos.

Fancy six streams, like the Thames, strung successively together, and you have the length of this river; take the Rhine twice from its source in the glacier of Mount Adula to the sands of Katwyk, and you have the measure of the Xingu. Before the confluence of this last of its great tributaries,—for the Tocantines, though considered by some geographers as a vassal, is in reality an independent stream,—the breadth of the Amazons appeared to Von Martius equal to that of the Lake of Constance; but soon even this enormous bed becomes too narrow for the vast volume of its waters, for below Gurupa it widens to an enormous gulf, which might justly be called the ‘Bay of the Thousand Isles.’ Nobody has ever counted their numbers; no map gives us an idea of this labyrinth. If we reckon the island of Marajo, which equals Sicily in size, to the delta of the Amazons, its extreme width on reaching the ocean is not inferior to that of the Baltic in its greatest breadth.

Dangerous sand-banks guard the giant’s threshold; and no less perilous to the navigator is the famous Pororocca, or the rapid rising of the spring-tide at the shallow mouths of the chief stream and of some of its embranchments,—a phenomenon which, though taking place at the mouth of many other rivers, such as the Hooghly, the Indus, the Dordogne, and the Seine,† nowhere assumes such dimensions as here, where the colossal wave frequently rises suddenly along the whole width of the

\* ‘The Sea and its Living Wonders.’ Second Edition, p. 41.

† Ibid, p. 40.

stream to a height of twelve or fifteen feet, and then collapses with a roar so dreadful that it is heard at the distance of more than six miles. Then the advancing flood-wave glides almost imperceptibly over the deeper parts of the river-bed, but again rises angrily as soon as a more shallow bottom arrests its triumphant career.

Our knowledge of the courses of most of the tributaries of the Amazons is very imperfect, and science knows next to nothing of the natural history of their banks. Even a correct map of the main stream is still wanting, for though its general course and the most important bends are tolerably well laid down, the numerous islands and parallel channels, the great lakes and offsets, the deep bays and the varying widths of the stream are quite unknown.

The numerous tributary streams of the Amazons differ remarkably in the colour of their waters and may be divided into three groups—the white or pale yellowish-water rivers, the blue-water rivers and the black-water rivers.

The difference of colour between the white-water and blue-water rivers is evidently owing to the nature of the country they flow through; a rocky and sandy district will always have clear-water rivers; an alluvial or clayey one will have troubled streams.

The Rio Negro is the largest and most celebrated of the black-water rivers. All its upper tributaries, the smaller ones especially, are very dark, and, when they run over white sand, give it the appearance of gold, from the rich colour of the water, which, when deep, appears inky black. In the rainy season, when the dark clouds above cause the water to appear of a yet more funereal blackness and the rising waves break in white foam over the vast expanse, the scene, as may well be imagined, is gloomy in the extreme.

The peculiar colour of the black-water rivers appears to be produced by the solution of decaying leaves, roots and other vegetable matter. In the virgin forests in which most of these streams have their source the little brooks and rivulets are half choked up with dead leaves and rotten branches giving various brown tinges to the water. When these rivulets meet together and accumulate into a river, they of course have a deep brown hue very similar to that of our bog or peat water, if there are

no other circumstances to modify it. But if the stream flows through a district of soft alluvial clay, the colour will of course be modified and the brown completely overpowered.

A peculiarity of the black waters is the absence of mosquitos along their banks, which thus afford agreeable places of refuge to the persecuted traveller. No inducement will make an Indian boatman paddle so hard as the probability of reaching one of these privileged spots before midnight and being enabled to enjoy the comforts of sleep till morning.

The basin of the Amazons extending over an area of 2,330,000 English square miles surpasses in dimensions that of any other river in the world. All western Europe could be placed in it without touching its boundaries and it would even contain our whole Indian empire. It is entirely situated in the Tropics, on both sides of the Equator, and receives over its whole extent the most abundant rains. The body of fresh water which it empties into the ocean is therefore far greater than that of any other river; not only absolutely but probably also relatively to its area, for as it is almost entirely covered by dense virgin forests, the heavy rains which penetrate them do not suffer so much evaporation as when they fall on the scorched Llanos of the Orinoco or the treeless Pampas of La Plata.

Some idea may be formed of the vastness of the territory drained by the Amazons from the fact that at the sources of its northern and southern tributaries, the rainy season takes place at opposite times of the year. So wonderful is the length of the stream that, while at the foot of the Andes it begins to rise early in January, the Solimoens swells only in February: and below the Rio Negro the Amazons does not attain its full height before the end of March.

The swelling of the river is colossal as itself. In the Solimoens and farther westwards the water rises above forty feet; and Von Martius even saw trees whose trunks bore marks of the previous inundation fifty feet above the height of the stream during the dry season.

Then for miles and miles the swelling giant inundates his low banks, and, majestic at all times, becomes terrible in his grandeur when rolling his angry torrents through the wilderness. The largest forest-trees tremble under the pressure of the waters, and trunks, uprooted and carried away by the

stream, bear witness to its power. Fishes and alligators now swim where a short while ago the jaguar lay in wait for the tapir, and only a few birds, perching on the highest tree-tops, remain to witness the tumult which disturbs the silence of the woods.

When at length the river retires within its usual limits, new islands have been formed in its bed, while others have been swept away; and in many places the banks, undermined by the floods, threaten to crush the passing boat by their fall,—a misfortune which not seldom happens, particularly when high trees come falling headlong down with the banks into the river.

The lands flooded to a great depth at every time of high water are called in the language of the country 'Gapo,' and are one of the most singular features of the Amazons. They extend hundreds of miles along the river's course, and vary in width on each side from one to ten or twenty miles. Through the Gapo a person may go by canoe in the wet season, without once entering into the main river. He will pass through small streams, lakes, and swamps, and everywhere around him will stretch out an illimitable waste of waters, but all covered with a lofty virgin forest. For days he will travel through this forest scraping against the trunks of trees, and stooping to pass beneath the leaves of prickly palms now level with the water though raised on stems forty feet high. In this trackless maze the Indian finds his way with unerring certainty, and by slight indications of broken twigs or scraped bark goes on day by day as if travelling on a beaten road.

The magical beauty of tropical vegetation reveals itself in all its glory to the traveller who steers his boat through the solitudes of these aquatic mazes. Here the forest forms a canopy over his head; there it opens, allowing the sunshine to disclose the secrets of the wilderness; while on either side the eye penetrates through beautiful vistas into the depths of the woods. Sometimes, on a higher spot of ground, a clump of trees forms an island worthy of Eden. A chaos of bushropes and creepers flings its garlands of gay flowers over the forest, and fills the air with the sweetest odours. Numerous birds, rivalling in beauty of colour the passifloras and bignonias of these hanging gardens, animate the banks of the lagune, while gaudy macaws perch on the loftiest trees; and as if to remind

one that death is not banished from this scene of paradise, a dark-robed vulture screeches through the woods, or an alligator rests, like a black log of wood or a sombre rock, on the dormant waters.



BLUE MACAW.

The inundations of the Amazons essentially modify the character of the bordering forest ; for it is only beyond their verge that the enormous fig and laurel trees, the *Lecythas* and the *Bertholletias*, appear in all their grandeur. As here the underwood is less dense and more dwarfish, it is easy to measure the colossal trunks, and to admire their proportions, often towering to a height of 120 feet, and measuring fifteen feet in diameter above the projecting roots. Enormous mushrooms spring from the decayed leaves, and numberless parasites rest upon the trunks and branches. The littoral forest, on the contrary, is of more humble growth. The trunks, branchless in their lower part, clothed with a thinner and a smoother bark, and covered with a coat of mud according to the height of the previous inundation, stand close together, and form above a mass of interlacing branches. These are the sites of the cacao-tree and of the prickly sarsaparilla, which is gathered in large quantities for the druggists of Europe. Leafless bushropes wind in grotesque festoons among the trees, between whose trunks a dense underwood shoots up, to perish by the next overflowing of the stream. Instead of the larger parasites, mosses and jungermannias weave their carpets over the drooping branches. But few animals besides the numerous water-birds inhabit this damp forest zone, in which, as it is almost superfluous to add, no plantation has been formed by man.

The many islands of the delta of the Amazons are everywhere encircled by mangroves ; but sailing stream upwards, the monotonous green of these monarchs of the shore is gradually replaced by flowers and foliage, which, in every variety of form and colour, for hundreds and hundreds of miles characterise the banks of the river.

During the dry season prickly astricarias, large musaceæ, enormous bamboo-like grasses, white plumed ingas, and scarlet poivreas, are most frequently seen among the numberless plants

growing along the margin of the stream. Above the shrubbery of the littoral forest numberless palms tower, like stately columns, to the height of a hundred feet; while others of a lower stature are remarkable for the size of their trunks, on which the foot-stalks of the fallen leaves serve as supports for ferns and other parasites.

It stands to reason that in a length of more than 3,000 miles the species of plants must frequently change; yet the low banks of the Amazons, and of its vassals, as soon as they have emerged from the mountains where they rise, have everywhere a similar character. On sailing down the river for hundreds of miles, the eye may at length grow weary of the uniformity of a landscape, which remains constantly the same; but the interest increases as the mind becomes more and more impressed by the grandeur of its dimensions. A broad stream, now dividing into numerous arms, and now swelling into a lake; a dark forest-border, which on so flat a ground seems at a distance like an artificial but colossal hedge: these are the only elements of which the landscape is composed. No busy towns rise upon the banks, and it is only at vast intervals that one finds a few wretched huts, which are soon again lost in the forest; but a sky so brilliant spreads over the whole scene, and the rays of the sun beam upon a nature of such luxuriance, that the traveller, far from feeling the voyage monotonous, proceeds on his journey with increasing interest, and every morn salutes with new joy the majestic wilderness.

The boat floats along, borne by the current of the river, which, in the dry season, generally flows at the rate of four English miles in an hour. Even during the night the journey is usually continued, when no special danger claims a greater caution, and a landing only takes place when the desire becomes general to enjoy a perfectly quiet night's rest, or when a broad sand bank happens to be invitingly near. Generally an island is selected, as affording both greater security from beasts of prey and a clearer ground. The Indians are not obliged to fetch fire-wood from a distance, for trees, drifted by the floods, are constantly found at the upper end of the river-islands, where they remain until the next inundation once more raises them; and thus many of them are ultimately drifted by the ocean currents to distant lands. The Indians sometimes set

fire to the whole pile, and then the flames, taking an unexpected direction, may force the company to flee as fast as possible to the raft, and to settle in a safer place, while they continue to blaze over the forest, or to cast a lurid light over the waters.

Fires are frequently lighted for a more useful purpose on the banks of the stream, as they never fail to attract a number of large fishes, which the dexterous Indians know how to strike with their harpoons. While some are thus engaged, others are lurking for the tortoises that pay their nightly visits to the bank, anxious to bury their numerous eggs in the sand. Thus almost every landing on one of these river-islands furnishes fresh provisions for the continuance of the journey; for the captured tortoises are bound to the raft, where, in the enjoyment of water and shade, they continue to live for a long time.

As soon as the supper is finished, the Indians, after throwing an additional log upon the watch-fire, all stretch themselves on the ground, under their dark-coloured toldos, or mosquito covers, which on the white sand have the appearance of as many coffins. Their tranquil breathing soon tells that they are enjoying the deep repose peculiar to their race; but sleep forsakes the European amid scenes so novel and so grand. The soul is struck with impressions which compel it to reflection. The ripple breaks lightly on the bank; no noise, save the crackling of the fire, breaks the stillness of the night. Only from time to time the splashing of a fish is heard in the distant centre of the stream. The same stillness reigns in the skies; for not the slightest cloud dims the brightness of the stars. But suddenly the waters begin to rustle at a distance, as if wave were rolling after wave, and as the strange sound draws nigh, an unusual agitation becomes apparent in the water. The awakening Indians whisper anxiously, for they imagine an enormous reptile to be the cause of the phenomenon. They also believe the lagunes of the great stream to be the seat of a prodigious serpent, equal in size and power to the fabulous sea-snake; for the *yacu-mama*, or 'mother of the waters,' as this imaginary monster is called, attracts by a single inspiration every living creature—man, quadruped, or bird—that passes within a hundred feet of its jaws. As the maelstrom sucks down the helpless boat that comes within its vortex,

thus the mighty air-current forces its prey into the wide mouth of the monster lurking in the thicket. For this reason an Indian will never venture to enter an unknown lagune without blowing his horn, as the yacu-mama is said to answer, and thus to give him time for a speedy flight. The 'mother of the waters' is said to be at least fifty paces long, and to measure ten or twelve yards in circumference. Thus fancy is as busy in creating imaginary terrors in the lagunes of the Marañon as on the rocky shores of Scandinavia.

Infinitely more dangerous than this fabulous serpent, more dreadful even than the cayman or the anaconda, are the pirangas, a small species of salmon, which in many places attack the unfortunate swimmer with their sharp teeth, and taint the waters with his blood. Castelnau saw how a stag, which threw itself in the river to avoid the hunter's pursuit, was soon killed by the pirangas. The Roman knight that cast his slaves to the murænas,\* would, no doubt, have been rejoiced to people his ponds with fish like these; and Tiberius would have been delighted to have possessed them at Capræa!

A night encampment in the Amazons is, however, not always so pleasant as the foregoing description might lead one to suppose; for many islands are so infested with mosquitos that they are quite intolerable, and the growl of a jaguar or the sight of a crocodile (for this animal is by no means afraid of fire) not unfrequently disturbs the company. Complete security from these persecutions and visits is only to be found in the centre of the stream; for here a cayman is seldom seen, and the wings of the insects are too weak to carry them to such a distance from the shore.

The most striking features of the Amazons, besides its vast expanse of smooth water, generally from three to six miles wide, are the great beds of aquatic grass which line its shores, large masses of which are often detached and form floating islands; the quantity of fruits and leaves and great trunks of trees which it carries down, and its level banks clad with high unbroken masses of verdure. In places the white stems and leaves of the Cecropias give a peculiar aspect, and in others the straight dark trunks of lofty forest trees form a living wall

\* 'The Sea and its Living Wonders,' p. 195.

along the water's edge. There is much animation, too, on this great stream. Numerous flocks of parrots and the great red and yellow macaws fly across every morning and evening, uttering their hoarse cries. Many kinds of herons and rails frequent the marshes on its banks, and a great handsome duck (*Chenalobex jubata*) is often seen swimming about the bays and inlets. But perhaps the most characteristic birds of the Amazons are the gulls and terns which are in great abundance. All night long their cries are heard over the sand banks where they deposit their eggs, and during the day they may constantly be seen, sitting in a row on a floating log, sometimes a dozen or twenty side by side, and going for miles down the stream as grave and motionless as if they were on some very important business. These birds deposit their eggs in little hollows in the sand, and the Indians say that during the heat of the day they carry water in their beaks to moisten them, and prevent them being roasted by the scorching sun. Besides these there are divers and darters in abundance, porpoises are constantly blowing in every direction, and alligators are often seen slowly swimming across the river. An amazing number of fishes peoples the waters of the Amazons and its tributaries. They supply the Indians with the greater part of their animal food, and are at all times more plentiful and easier to be obtained than birds or game from the forest. Mr. Wallace found 205 species in the Rio Negro alone, and as most of those which inhabit the upper part of the river are not found near its mouth, where there are many other kinds equally unknown in the clearer, darker, and probably colder waters of its higher branches, he estimates that at least 500 species exist in the Rio Negro and its tributary streams. In fact, in every small river and in different parts of the same river distinct kinds are found, so that it is impossible to estimate the number in the whole valley of the Amazons with any approach to accuracy.

To describe the countless tribes of insects that swarm in the dense forests of that vast basin would be equally vain. In no country in the world is there more variety and beauty, nowhere are there species of larger size and of more brilliant colours. The great mass of the beetles are indeed inferior to those of tropical Africa, India, and Australia, but it is in the lovely

butterflies that the Amazonian forests are unrivalled, whether we consider the endless variety of the species, their large size, or their gorgeous colour. South America is the richest part of the world in this group of insects, and the Amazons seems the richest part of South America.

In more than one respect the Amazons reminds one of the ocean, from whose bosom its waters originally arose. Like the sea, it forms a barrier between various species of animals; for the monkeys on its northern bank are different from those of the forests on its southern side, and many an insect—nay, even many a bird—finds an impassable barrier in the enormous width of the river. Like the sea, it has a peculiar species of dolphin, and hundreds of miles up the stream, sea-mews and petrels, deceived by its grandeur, screech or shoot in arrowy flight over its fish-teeming waters. As over the ocean, or in the desert, the illusions of the mirage are also produced over the surface of the Marañon. The distant banks, not always clearly defined even in the morning, disappear wholly at noon, and the rays of the sun are then so refracted that the long rows of palms appear in an inverted position.

The dreadful storms which burst suddenly over the Amazons, likewise recal to memory the tornados of the ocean. The howlings of the monkeys, the shrill tones of the mews, and the visible terror of all animals, first announce the approaching conflict of the elements. The crowns of the palms rustle and bend, while as yet no breeze is perceptible on the surface of the stream; but, like a warning voice, a hollow murmur in the air precedes the black clouds ascending from the horizon, like grim warriors ready for battle. And now the old forest groans under the shock of the hurricane; a night-like darkness veils the face of nature; and, while torrents of rain descend amid uninterrupted sheets of lightning and terrific peals of thunder, the river rises and falls in waves of a dangerous height. Then it requires a skilful hand to preserve the boat from sinking; but the Indian pilots steer with so masterly a hand, and understand so well the first symptoms of the storm, that it seldom takes them by surprise, or renders them victims of its fury.

Among the dangers of the Amazons, the rapids must not be forgotten that frequently arise where large tracts of the bank,

undermined by the floods, have been cast into the river. The boat is almost unavoidably lost when carried by the current among the branches of the trees, which, though submerged, still remain attached to the ground, and sweep furiously through the eddy, overturning or smashing all that comes within their reach.

Perhaps no country in the world contains such an amount of vegetable matter on its surface as the valley of the Amazons. Its entire extent, with the exception of some very small portions, is covered with one dense and lofty primeval forest, the most extensive and unbroken which exists upon the earth. It is the great feature of the country, that which at once stamps it as a unique and peculiar region. It is not here, as on the coasts of southern Brazil, or on the shores of the Pacific, where a few days' journey suffices to carry us beyond the forest district, and into the parched plains and rocky sierras of the interior. Here one may travel for weeks and months inland in any direction, and find scarcely an acre of ground unoccupied by trees.

It is far up in the interior where the great mass of this mighty forest is found; not on the lower part of the river, near the coast as is generally supposed. Bounded on one side by the Andes, on the other by the Atlantic, it extends from east to west for a distance of 2,600 miles; and from 7 N. latitude on the banks of the Orinoco, to 18 S. latitude on the northern slope of the great mountain chain of Bolivia, a distance of more than 1,700 miles. From a point about sixty miles south-east of Tabatinga, on the Upper Amazons, a circle may be drawn of 1,100 miles in diameter, the whole area of which will be virgin forest. Such are the magnificent proportions of these wonderful woods, which speak to the imagination as forcibly as the ocean or the Great Sahara.

The forests of no other part of the world, not even the immense fir-woods of Siberia or of North America, are so extensive and unbroken as this. Those of Central Europe are trifling in comparison, nor in India are they very continuous or extensive. Africa contains some large forests situated on the east and west coasts, and in the interior south of the Equator, but the whole of them would bear but a small proportion to that of the Amazons. In a general survey of the tropical

world, we may, therefore, look upon South America as pre-eminently the land of forests, contrasting strongly with Asia or Africa, where deserts are the most characteristic features.

If the Nile—so remarkable for its historical recollections, which carry us far back into the by-gone ages—and the Thames, unparalleled by the greatness of a commerce which far eclipses that of ancient Carthage or Tyre—may justly be called *the rivers of the past* and the *present*, the Amazons has equal claims to be called the stream of the *future*; for a more splendid field nowhere lies open to the enterprise of man.

All the gifts of Nature are scattered in profusion over the vast territory drained by the river. The mountains, where it rises, teem with mineral treasures, and the very ideal of fertility is realised in those well-watered plains, where the equatorial sun develops life in boundless luxuriance. The most useful and costly productions of the tropical world,—sugar, cotton, coffee, indigo, tobacco, maize, rice; quinquina in the higher regions of the Marañon, where wheat and the vine find a congenial climate; cacao and vanille, sarsaparilla and caoutchouc, various palms of the most manifold uses; trees and shrubs, some rivalling our oaks in the solidity of their timber, others fit by the beauty of their grain to adorn palaces; dyes, resins, gums, spices, drugs,—all, in one word, that is capable of satisfying the wants of the frugal or the fancies of the rich, might there be raised in profusion over a space surpassing England at least forty times in extent. The whole actual population of the globe could easily live in content and plenty in the almost uninhabited valleys of the Marañon and its tributary streams.

With these magnificent prospects the present forms a melancholy contrast. Here and there some small town or wretched village rises on the banks of the mighty stream; and a few Indians roam over the forests, through which it rolls along, or enjoy the produce of its prolific waters. The vast province of Para, the garden of Brazil, the paradise of unborn millions, has scarcely four inhabitants on a geographical square mile; while even the northern province of Archangel, the land of the stunted fir and the mossy tundra, has a population four times as large. But since the last few years, steamboats regularly ascend the giant stream and some of its tributaries almost to

the foot of the Andes ; railroads are being made where navigation is impeded by rapids, and ere long civilization and industry will have dawned over the vast woodlands of the Amazon.

Eight years after Columbus had revealed the existence of a new world, Vincent Yañez Pinson, the companion of his first voyage, sailed with four ships from the port of Palos (13th January, 1500), steered boldly towards the south, crossed the line, and discovered the mouth of the Amazons. Forty years later Gonsalo Pizarro, governor of Quito, left his capital with 340 Spaniards and 4,000 Indian carriers to conquer the unknown countries to the east of the Andes. The march over the Puna and the high mountain ridges proved fatal to the greater part of their wretched attendants ; and even the Spaniards—accustomed to brave every climate and hardship wherever gold held forth its glittering promise—had much to suffer from the excess of cold and fatigue. But when they descended into the low country their distress increased. During two months it rained incessantly, without any interval of fair weather long enough to enable them to dry their clothes. They could not advance a step, unless they cut a road through woods, or made it through marshes. The land, either altogether without inhabitants, or occupied by the rudest and least industrious tribes in the New World, yielded little food. Such incessant toil and continual scarcity were enough to shake the most stedfast hearts ; but the heroism and perseverance of the Spaniards of the sixteenth century surmounted obstacles which to all others would have seemed insuperable. Allured by false accounts of rich countries before them, they struggled on, until they reached the banks of the Napo, one of the rivers whose waters add to the greatness of the Marañon. There, with infinite labour, they built a bark, which they expected would prove of great use in conveying them over rivers, in procuring provisions, and in exploring the country. This was manned with fifty soldiers, under the command of Francis Orellana, the officer next in rank to Pizarro.

The stream carried them down so quickly that they were soon far ahead of their countrymen, who followed slowly and with difficulty by land. At first Orellana may have had no intention to betray the trust bestowed upon him by his commander ; but

on reaching the Marañon, the aspect of the stream rolling majestically to the east proved a temptation too strong for his ambition; and, forgetting his duty to his fellow-soldiers, he resolved to follow the course of the river, which seemed to beckon him onwards to riches and renown. But one among his followers, *Sanchez de Vargas*, whose name well deserves a record, had the courage to remonstrate against this breach of faith, for which he was landed as a criminal, without food or help of any kind. After a dangerous and romantic navigation of seven months, whose real adventures he afterwards embellished with fabulous tales of El Dorados and warlike Amazons, Orellana at length reached the mouth of the stream. Drifted by the current, he thence safely steered for the Spanish settlement in the island of Cubagua, and soon after embarked for Spain. The magnificence of his discovery threw a veil over his guilt; and having been appointed governor of the territory whose grandeur he had been the first to reveal, he once more crossed the ocean. But he was not destined to reach the scene where his ambition dreamt of exploits worthy to eclipse the fame of Cortes or Pizarro; a mortal disease befel him on the passage, and in the sea he found a nameless grave.

But what had meanwhile become of the leader whom he had so basely abandoned in the wilderness? The consternation of Pizarro on not finding the bark at the confluence of the Napo and the Marañon, where he had ordered Orellana to wait for him, may well be imagined. But, imputing his absence to some unknown accident, he advanced above fifty leagues along the banks of the river, expecting every moment to see the bark appear with abundant provisions and joyful tidings. At length he met with the faithful Vargas, and now no doubt remained about the treachery of his lieutenant and his own desperate situation. The spirit of his stoutest-hearted veterans sank within them; all demanded to be led back instantly, and Pizarro, though he assumed an appearance of tranquillity, did not oppose their inclination. But they were now 1,200 miles from Quito, and a march of many months had to be made without the hopes which had soothed their previous sufferings. Hunger compelled them to sacrifice all their dogs and horses, to devour the most loathsome reptiles, to gnaw the leather of their saddles and sword-belts. All the Indians and 210 Spaniards perished

in this wild expedition, which lasted nearly two years. When at length the survivors arrived at Quito, they were naked like savages, and so worn out with famine and fatigue that they looked more like spectres than men.

Two hundred years after the adventures of Pizarro and Orellana, the French naturalist, La Condamine, performed his celebrated voyage from Bracamoros to Para. He was accompanied by the learned M. Godin des Odonnais, who, leaving his wife on the eastern slope of the Andes, returned alone to Europe in the year 1479. After a separation of several years Madame Godin undertook to descend the Amazons to Para, where her husband was waiting for her. She embarked with her two brothers, a doctor, three female servants, and some Indians, in a large open boat. At the very first opportunity the doctor abandoned the party, and was soon followed by the Indians.

The unskilled travellers vainly attempted to steer their boat; it foundered on a sand bank, and Madame Godin with difficulty saved her life. They then made a raft, which met with the same misfortune. Undaunted by these repeated disasters, but completely inexperienced, they now resolved to proceed on foot through the forest; but hunger and fatigue soon drove them to despair, and they all perished, except Madame Godin, who, though physically the weakest, was morally the strongest of the party. Tattered, emaciated, exhausted, she at length met some Indians who treated her with the greatest kindness. The long struggle for her life, amid dangers and hardships without number, had bleached her hair, and stamped her with the marks of extreme old age. The good-natured savages guided her to the next European settlement, whence she continued her journey to Para without any further adventures. But the dreadful scenes she had witnessed, and the loss of the dear relations and faithful companions who one after the other had dropped from her side, had too severely shocked her nerves; and, though she escaped death in the wilderness, it was only to fall a prey to hopeless insanity.

## CHAPTER VI.

## THE PRIMEVAL FORESTS OF TROPICAL AMERICA.

Their peculiar Charms and Terrors—Disappointments and Difficulties of the Botanist—The Bush-ropes—Variety of Trees and Plants—Trees with Buttresses—Numberless parasites—Character of the Primitive Forest according to its Site—Its Aspect during the Rainy Season—A Hurricane in the Forest—Beauty of the Forest after the Rainy Season—Our Home Scenes equally beautiful—Bird Life on the rivers of Guiana—Morning Concert—Repose of Nature at Noon—Nocturnal Voices of the Forest.

THE peculiar charms of a tropical primeval forest are enhanced by the mystery of its impenetrable thickets; for however grand its lofty vaults, or lovely its ever-changing forms of leaf or blossom, fancy paints scenes still more beautiful beyond, where the eye cannot penetrate, and where, as yet, no wanderer has ever strayed. But imagination also peoples the forest with peculiar terrors; for man feels himself here surrounded by an alien, or even hostile, nature: the solitude and silence of the woods weigh heavily on his mind; in every rustling of the falling leaves a venomous snake seems ready to dart forth; and who knows what ravenous animal may not be lurking in the dense underwood that skirts the tangled path?

In Europe there is no room for such feelings; for in our part of the world there are no woods that may not be visited, even in their deepest recesses: no thorny bush-ropes stretch their intricate cordage before the wanderer; no masses of matted shrubs block up his way. But it is very different in the boundless forests of tropical America. Here the jaguar sometimes loses himself in such impenetrable thickets that, unable to hunt upon the ground, he lives for a long time on the trees, a terror to the monkeys; here the *padres* of the mission-stations, which are not many miles apart in a direct line, often require more

than a day's navigation to visit each other, following the windings of small rivulets in their courses, as the forest renders communication by land impossible.

Even the more open parts of the forest are full of mysteries. In our woods the summits of the highest trees are accessible; there is no blossom that we are not able to pluck—no plant that we are not able to examine, from its root to its topmost branches; but in the Brazilian forest, where the matted bush-ropes wind round the trunks like immense serpents waiting for their prey or stretch like the rigging of a ship from one tree to another, and blossom at a giddy height, it is frequently as impossible to reach their flowers as it is to distinguish to which of the many interlacing stems they may belong.

If any one should be inclined to tax this description with exaggeration, let him try to pluck the flowers of the lianas, or to ascend by climbing their flexible cordage. The tiger-cat and the monkey, perhaps also the agile Indian, may be able to accomplish the feat; but it would be utterly hopeless for the European to undertake it. Nor is it possible to drag down these inaccessible creepers; for, owing to their strength and toughness, it would be easier to pull down the tree to which they attach themselves than to force them from their hold. Here two or three together twisting spirally round each other form a complete living cable as if to bind securely the monarchs of the forest; there they form tangled festoons, and covered themselves with smaller creepers and parasitic plants, hide the parent stem from sight.

No botanist ever entered a primitive forest without envying the bird to whom no blossom is inaccessible, who, high above the loftiest trees, looks down upon the sea of verdure, and enjoys prospects whose beauty can hardly be imagined by man.

A majestic uniformity is the character of our woods, which often consist but of one species of tree, while in the tropical forests an immense variety of families strive for existence, and even in a small space one neighbour scarcely ever resembles the other. Even at a distance this difference becomes apparent in the irregular outlines of the forest, as here a dome-shaped crown, there a pointed pyramid, rises above the broad flat masses of green, in ever-varying succession. On approaching, the differences of colour are added to the irregularities of form; for

while our forests are deprived of the ornament of flowers, many tropical trees have large blossoms, mixing in thick bunches with the leaves, and often entirely overpowering the verdure of the foliage by their gaudy tints. Thus splendid white, yellow, or red-coloured crowns are mingled with those of darker or more humble hue. At length when, on entering the forest, the single leaves become distinguishable, even the last traces of harmony disappear. Here they are delicately feathered, there lobed—here narrow, there broad—here pointed, there obtuse—here lustrous and fleshy, as if in the full luxuriance of youth, there dark and arid, as if decayed with age. In many the inferior surface is covered with hair; and as the wind' plays with the foliage, it appears now silvery, now dark green—now of a lively, now of a sombre hue. Thus the foliage exhibits an endless variety of form and colour; and where plants of the same species unite in a small group, they are mostly shoots from the roots of an old stem. This is chiefly the case with the palms; but the species of the larger trees are generally so isolated in the wood, that one rarely sees two alike on the same spot. Each is surrounded by strangers that begrudge it the necessary space and air; and where so many thousand forms of equal pretensions vie for the possession of the soil, none is able to expand its crown or extend its branches at full liberty. Hence there is a universal tendency upwards; for it is only by overtopping its neighbours that each tree can attain the region of freedom and of light; and hence also the crowns borne aloft on those high columnar trunks are comparatively small. Shooting up straight and tall in this general struggle, they present no fantastic branches, no projecting limbs, like the sturdy oaks of our forests, and each, supported by the surrounding crowd, loses depth and tenacity of root. They may partly be compared to a body of military: the storm may rage, the lightning blast, the earthquake shake, and though many fall, the body at large scarcely feels the loss. Separate them and they will be found far inferior in power to the wild warrior, who, accustomed to stand alone, trusts to his own strength and dexterity to bear him through the worst storms of fate.

Among the trees the various kinds that have buttresses projecting around their base are the most striking and peculiar.

Some of these buttresses are much longer than they are high, springing from a distance of eight or ten feet from the base, and reaching only four or five feet high on the trunk; while others rise to the height of twenty or thirty feet, and can even be distinguished as ribs on the stem to forty or fifty. They are complete wooden walls from six inches to a foot thick, sometimes branching into two or three, and extending straight out to such a distance as to afford room for a comfortable hut in the angle between them. Other trees again appear as if they were formed by a number of slender stems growing together. They are deeply furrowed for their whole height, like the pillars in a cathedral, and in places these furrows reach quite through them, like windows in a narrow tower, yet they run up as high as their loftiest neighbours, with a straight stem of uniform diameter. Another most curious form is presented by those which have many of their roots high above the ground, appearing to stand on many legs, and often forming archways large enough for a man to walk beneath.

The stems of all these trees, and the climbers that wind or wave around them, support a multitude of dependants. *Tilandsias* and other *Bromeliaceæ*, resembling wild pine-apples, large climbing *Arums*, with their dark green, arrowhead-shaped leaves, peppers in great variety, and large-leaved ferns, shoot out at intervals all up the stem to the very topmost branches. Between these, creeping ferns and delicate little species like our *Hymenophyllum* abound, and in moist dark places the leaves of these are again covered with minute creeping mosses and *Jungermannias*, so that we have parasites on parasites, and on these parasites again. On looking upwards the infinite variety of foliage, strongly defined against the clear sky, is a striking characteristic of the tropical forest, and the bright sunshine lighting up all above, while a sombre gloom reigns below, adds to the grandeur and solemnity of the scene.

As these vast woods occupy sites of a very different character, —here extending along low river-banks, there climbing the slopes of gigantic mountains,—here under the equator, there on the verge of the tropics, where many of the trees, annually casting their foliage, remind one of the winter of the temperate

zone—it is of course quite impossible to embrace all their varieties of form and aspect in one general description.

On descending from the heights of the Andes to the plains of the Marañon, the eye is attracted, in the more elevated forests (the region of the quinquina trees), by a variety of fantastically flowering orchids—and of arborescent ferns, with their lacelike giant leaves—by large dendritic urticeas—by wonderful bignonias, banisterias, passifloras, and many other inextricably tangled bush-ropes and creepers. Farther downwards, though the lianas still appear in large numbers, the eye delights in palms of every variety of form, in terebinthinaceas, in leguminosas, whose sap is rich with many a costly balsam; in laurels, bearing an abundance of aromatic fruit; or it admires the broad-leaved heliconias, the large blossoms of the solaneas, and thousands of other flowers, remarkable for the beauty of their colour, the strangeness of their form, or their exquisite aroma.

In the deep lowlands the forest assumes a severe and dismal character: dense crowns of foliage form lofty vaults almost impenetrable to the light of day; no underwood thrives on the swampy ground; no parasite puts forth its delicate blossoms under the shade of the mighty trees and only mushrooms sprout abundantly from the humid soil.

Nothing can equal the gloom of these forests during the rainy season. Thick fogs obscure the damp and sultry air, and clouds of mosquitos whirl about in the mist. The trees are dripping with moisture; the flowers expand their petals only during the few dry hours of the day, and every animal seeks shelter in the thicket. No bird, no butterfly comes forth; the snorting of the capybaras, and the monotonous croaking of frogs and toads, are the only sounds that break the dull silence. Night darkens with increasing sadness over these dismal solitudes; no star is visible; the moon disappears behind thick clouds; and the roar of the jaguar, or the howling of the stentor-monkey, issue like notes of distress from the depth of the melancholy woods.

A hurricane bursting over the primeval forest is one of the most terrific scenes of nature. A hollow uproar in the higher regions of the air, as if the wild huntsman of the German legends were sweeping along with his whole pack of phantom hounds, precedes the explosion of the storm, while the lower

atmosphere still lies in deep repose. The roaring and rushing descends lower and lower; the higher branches of the trees strike wildly against each other; the forked lightning flashes through the night-like darkness; the thunder, repeated by a hundred echoes, rolls through the thicket; and trees, uprooted by the fury of the storm, fall with a loud crash, bearing down every stem of minor growth in their sweeping ruin. The howlings and wailings of terrified animals accompany the wild sounds of the tempest.

After the wet season the woods appear in their full beauty. Before the first showers, the long-continued drought had withered their leaves, and dried up many of the more delicate parasites, and during its continuance the torrents of rain despoiled them of all ornament; but when the clouds disperse and the animals come forth from their retreats to stretch their stiffened limbs in the warm sunshine, then also the vegetable world awakens to new life; and where, a few days before, the eye met only with green in every variety of shade, it now revels in the luxuriance of beautiful flowers, which embalm the air with exquisite fragrance.

At this time of the year the banks of the rivers of Guiana winding through the primitive woods are of magical beauty. Through the underwood which often overhangs wide spaces of the stream, the large white blossoms of the inga shine forth, along with the scarlet brushes of the magnificent combretia. Elegant palms, armed with a panoply of thorns, and bearing a profusion of red fruit, rise above this lovely foreground; and farther on, noble forest trees are seen festooned with creepers and parasites covered with flowers.

These fairy bowers are enlivened by birds of splendid plumage, particularly in the early morning, when the luscious green of the high palm-fronds or the burning yellow of the lofty leopoldinias, touched by the first rays of the sun, suddenly shines forth. Then hundreds of gaudy parrots fly across the river; numberless colibris dart like winged gems through the air; whole herds of cotingas flutter among the blossoms; ducks of brilliant plumage cackle on the branches of submerged trees; on the highest tree-tops the toucan yelps his loud pia-po-ko! while, peeping from his nest, the oriole endeavours to imitate the sound; and the scarlet ibis flies in troops to the coast, while

the white egret flutters along before the boat, rests, and then again rises for a new career.

Yet pick out even the loveliest of these privileged spots where the most gorgeous flowers of the tropics expand their glowing petals, and for every scene of this kind we may find another at home of equal beauty and with an equal amount of brilliant colour.

'Look at a field of buttercups and daisies,' says Mr. Wallace, a very competent judge, 'a hill-side covered with gorse and broom, a mountain rich with purple heather, or a forest glade azure with a carpet of wild hyacinths, and they will bear a comparison with any scene the tropics can produce. I have never seen anything more glorious than an old crab-tree in full blossom, and the horse-chestnut, lilac, and laburnum will vie with the choicest tropical trees and shrubs. In the tropical waters are no more beautiful plants than our white and yellow water lilies, our irises and flowering rush, for I cannot consider the flower of the *Victoria Regia* more beautiful than that of the *Nymphæa alba*, though it may be larger, nor is it so abundant an ornament of the tropical waters as the latter is of ours.'

Let us, therefore, unseduced by the highly coloured statements of travellers, learn to be contented with the beauties which Nature has lavished on our woods and fields, nor deem that England—

'Where lawns extend that scorn Arcadian pride,  
And brighter streams than famed Hydaspes glide'—

has received but a step-motherly share in the distribution of her gifts.

Like the ocean, the forest has its voices, now swelling into uproar, now subsiding into silence; but while the wind and the breaker are the only musicians of the sea, the woods resound with animal voices.

In general, the morning hours are the loudest; for the creatures that delight in daylight, though not more numerous than the nocturnal species, have generally a louder voice. Their full concert, however, does not begin immediately after sunrise; for they are mostly so chilled by the colder night, that they need to be warmed for some time before awakening to the

complete use of their faculties. First, single tones ring from the higher tree-crowns, and gradually thousands of voices join in various modulation—now approaching, now melting into distance. Pre-eminent in loudness is the roar of the howling monkeys, though without being able fully to stifle the discordant cries and chattering of the noisy parrots. But the sun rapidly ascends towards the zenith, and one musician after the other grows mute and seeks the cool forest shade, until finally the whole morning concert ceases. Where the rays of light break through the foliage and play upon the under-wood, or on the damp ground, gaudy butterflies flutter about, beetles of metallic brilliancy warm themselves, and richly-robed or dark-vested snakes creep forth; for these indolent creatures are also fond of basking in the sun.

As the heat grows more intense, the stillness of the forest is only interrupted at intervals by single animal voices. Sometimes it is the note of the ivory-billed woodpecker, resounding like the distant axe of the forester, or the wail of the sloth breaking forth from the dense thicket. Sometimes human voices seem to issue from the depth of the forest, and the astonished huntsman fancies himself close to his comrades of the chase, or in the more dangerous neighbourhood of a wild tribe of Indians. With deep attention he listens to the sounds, until he discovers them to be the melancholy cry of the wood-pigeon.



IVORY-BILLED WOODPECKER.

The deepest silence reigns at noon, when the sun becomes too powerful even for the children of the torrid zone; and many creatures, particularly the birds, sink into a profound sleep. Then all the warm-blooded animals seek the shade, and only the cold reptiles—alligators, lizards, salamanders—stretch themselves upon the glowing rocks in the bed of the forest streams, or on sunny slopes, and, with raised head and distended jaws, seem to inhale with delight the sultry air.

As the evening approaches, the noise of the morning begins to re-awaken. With loud cries the parrots return from their distant feeding-grounds to the trees on which they are

accustomed to rest at night; and, as the monkeys saluted the rising sun, so, chattering or howling, they now watch him sinking in the west.

With twilight a new world of animals—which, as long as the day lasted, remained concealed in the recesses of the forest—awakens from its mid-day torpor, and prepares to enjoy its nightly revels. Then bats of hideous size wing their noiseless flight through the wood, chasing the giant hawk-moths and beetles, which have also waited for the evening hour, while the felidæ quit their lairs, ready to spring on the red stag near some solitary pool, or on the unwieldy tapir, who, having slept during the heat of the day, seeks, as soon as evening approaches, the low-banked river, where he loves to wallow in the mud. Then also the shy opossum quits his nest in hollow trees, or under some arch-like vaulted root, to search for insects or fruits, and the cautious agouti sallies from the bush.

In our forests scarcely a single tone is heard after sunset; but in the tropical zone many loud voices celebrate the night, where for hours after the sun has disappeared, the cicadæ, toads, frogs, owls, and goatsuckers chirrup, cry, croak, howl, and wail. The quietest hours are from midnight until about three in the morning. Complete silence, however, occurs only during very short intervals; for there is always some cause or other that prompts some animal to break the stillness. Sometimes the din grows so loud that one might fancy a legion of evil spirits were celebrating their orgies in the darkness of the forest. The howling of the aluates, the whine of the little sapajous, the snarl of the duruculi, the roaring of the jaguar, the grunt of the pecari, the cry of the sloth, and the shrill voices of birds, join in dreadful discord. Humboldt supposes the first cause of these tumults to be a conflict among animals, which, arising by chance, gradually swells to larger dimensions. The jaguar pursues a herd of pearing or tapirs, which break wildly through the bushes. Terrified by the noise, the monkeys howl, awakening parrots and toucans from their slumber; and thus the din spreads through the wood. A long time passes before the forest returns to its stillness. Towards the approach of day the owls, the goatsuckers, the toads, the frogs, howl, groan, and croak for the last time; and as soon as the first beams of morning purple the sky, the shrill notes of the cicadæ mix with their expiring cries.



BOTOCUDO INDIANS ATTACKING A JAGUAR.

## CHAPTER VII.

### THE WILD INDIANS OF TROPICAL AMERICA

The wild Forest Tribes—Their Physical Conformation and Moral Characteristics—Their Powers of Endurance not inferior to those of other Races—Their stoical indifference—Their Means of Subsistence—Fishing—Hunting—The Wourali Poison—Ornaments—Painting—Tattooing—Religion—The Moon, a Land of Abundance—The Botuto—The Piaches—The Savage Hordes of Brazil and Guiana—The Ottomacas—Dirt-eaters—Their Vindictive Ferocity and War Stratagems—The extinct Tribe of the Atures—A Parrot the last Speaker of their Language—Their Burial-cavern—The Uaupes Indians—Their large Huts—Horrid Custom of Disinterment—The Macus—The Purupurus—The 'Palheta'—The Mandrucus—Singular resemblance of some of the Customs of the American Indians to those of Remote Nations—The Caribs—The Botocudos—Monstrous distension of the Ears and Under-lip—Their Bow and Arrow—Their Migrations—Bush-rope Bridge—Botocudo Funeral—'Tanchon,' the Evil Spirit.

**T**HOUGH nominally under the dominion of the European race, yet a considerable part of tropical America still remains in the undisturbed possession of its native tribes. While the stranger has established his chief settlements along the coast or in those parts of the interior which before his arrival were already the seats of a certain degree of culture, where before him the Incas had founded cities and a large

agricultural population occupied the fertile table-lands of Anahuac, the wild hunter, unsubjected to the rules and trammels of civilised life, still roams over the boundless woods or interminable savannahs through which the Amazons, the Orinoco, and a hundred other great streams wend their way from the Andes to the Ocean. Here the primitive American can still be studied; here he exhibits the same traits of character and follows the same mode of life as his fathers before him, in the times of Cortez or Pizarro.

Many of the forest tribes, indeed, have been converted to Christianity, and live in missions or small settlements situated far apart on the banks of the great rivers; others are willing to barter the drugs, india-rubber, or rare birds and insects, they gather in the woods for articles of European manufacture; but many desiring no more than what their native wilds supply, never or but seldom cross the path of civilised man.

Though divided into a large number of hostile tribes, and scattered over an immense extent of country, from the Atlantic to the Pacific, and far beyond the bounds which separate one tropic from the other, yet the American Indians so nearly resemble each other, both in their features and the qualities of their minds, as evidently to be descended from one source. Their complexion is of a reddish-brown, more or less resembling the colour of copper. There is, however, a great diversity of shade among the several tribes, which appears to be less dependent on the influence of climate than on an original disposition, varying in the different branches of the American race. The elevation above the sea, or the vicinity of the equator, seems to have no great influence, for both Ulloa and Humboldt were astonished to find the Indians as bronze-coloured or as brown in the cold regions of the Cordilleras as in the hot plains of Venezuela. On the sultry banks of the Orinoco there are even tribes characterised by a remarkable fairness of complexion, living in the vicinity of others more than commonly brown. D'Orbigny makes this lightness of colour coincide with the woody and shady character of the quarters inhabited; the Maripas, for instance, who inhabit the most exposed countries, being also the darkest in hue.

The hair of the American Indians is always black, long, coarse,

and uncurled. With rare exceptions they carefully eradicate their scanty beard. Their forehead is generally low, their black and deep-seated eyes have their upper angles turned upwards, and their cheek-bones are broad and high. While they thus in some of their features resemble the Mongol type, they widely differ from it by the form of their nose, which is as prominent as in the Caucasian race. The mouth is large, the lips broad, but not thick as those of the Negro; the chin short and round, the jaws remarkably strong and broad. The expression of the eye is in some tribes mild and serene, in others it shows a forbidding mixture of melancholy and ferocity. There is generally a remarkable rigidity in the features of the American, very different from that lively play in a European countenance, which often reflects as a mirror every emotion of the mind. Some tribes are of small stature, others athletic; the limbs are generally well-turned; the feet small; the body of just proportions.

The beardless countenance and smooth skin seem to indicate a defect of vigour which does not exist in reality. In those parts of the continent where hardly any labour is requisite to procure subsistence, and the powers of the body and mind are not called forth, indolence indeed produces its usual effects, weakness and languor; but wherever the aboriginal American is accustomed to toil, he is found capable of performing such tasks as equal any effort of the natives either of Africa or of Europe. In many of the silver mines of Mexico, where the ore is conveyed to the surface by human labour, the native Indians will climb steep ladders with 240 to 380 pounds, and perform this hard work for six hours consecutively. Their muscular strength seemed truly astonishing to Humboldt, who, though having no weight but his own to carry, felt himself utterly exhausted after ascending from a deep mine.\* In propelling a boat against a rapid stream, or in supporting the fatigues of a long march, the Indian evinces similar powers of endurance and exertion, which prove him to be not inferior in this respect to the other races of man.

The uniformity which prevails in the features of the American aboriginals, exists also in the qualities of their minds, which generally exhibit an apparent indifference to pain or pleasure

\* The Subterranean World.' Second Edition, p. 306.

that would have done honour to a Stoic. Insensible to the charms of beauty and the power of love, they treat their women with coldness and indifference, being at no pains to win their favour by the assiduity of courtship, and still less solicitous to preserve it by indulgence and gentleness. Grave, even unto sadness, they have nothing of that giddy vivacity peculiar to many Europeans. Frequently placed in situations of danger and distress, depending on themselves alone, and wrapped up in their own thoughts and schemes, their minds are tinted with an habitual melancholy. Their attention to others is small, the range of their own ideas narrow. Hence that taciturnity which is so disgusting to men accustomed to exchange their thoughts in social conversation. When not engaged in some active pursuit, the wild Americans often sit whole days in one posture without opening their lips.

When they go forth to war or to the chase, they usually march in a line at some distance from one another, and without exchanging a word. The same profound silence is observed when they row together in a canoe. It is only when they are animated by intoxicating liquors, or roused by the excitement of the dance, that they relax from their usual insensibility and give some signs of sympathy with their kind.

All their thoughts intent upon self-preservation, they live only in the present, and seem alike indifferent to the past and the future. Gratitude, friendship, ambition, are sentiments of which they have no idea; and war or the pursuit of wild animals the only occupations which are able to rouse them from their stolid apathy.

Many tribes depend entirely upon fishing or the chase for their subsistence; others rear a few plants, which in a rich soil and a warm climate are soon trained to maturity. With a moderate exertion of industry and foresight the maize, the manioc, and the plantain would enable them to live in abundance, but such is their improvident laziness that the provisions they obtain by cultivating the ground are but limited and scanty, and thus when the woods and rivers withhold their usual gifts, they are often reduced to extreme distress.

The streams and lagunes of South America abound with an infinite variety of the most delicate fish, and Nature seems to have indulged the indolence of the Indian by the liberality

with which she ministers in this way to his wants. They swarm in such shoals that in some places they are caught without art or industry. In others the natives have discovered a method of infecting the water with the juice of certain plants, by which the fish are so intoxicated that they float on the surface, and are taken with the hand.

In one of the shallow lagunes of the Amazons, the French traveller Castelnau witnessed fish-catching by this means on a grand scale. On the previous evening a quantity of branches of the Barbasco (*Jacquinia armillaris*), after having been beaten with clubs, and divided among the canoes that were to take part in the sport, had been steeped in water, and then flung with the infusion into the lagune. At least five hundred Indians stood on the banks among the high rushes or on the trunks of trees, armed with arrows, harpoons, and clubs. At first only small fishes appeared upon the surface, and as if stunned, and then, suddenly awakening, sought to leap upon the bank. Then the larger species were seen to float on the water, or to make similar efforts to escape from the poisoned element. During the whole day the canoes of the Indians were passing on the lagune, and the same bustle reigned along the banks. The whistling of the arrows was incessantly heard, together with the beating of the clubs upon the water, while on land no less activity was displayed in cutting up, smoking, and salting the fish. Castelnau counted thirty-five different species, and estimated the number caught at 50,000 or 60,000, many measuring a foot or more in length. Although the lagune was thus poisoned, the Indians drank the water with impunity, and the river tortoises and alligators seemed to be equally untouched by the Barbasco juice which proved so fatal to the fishes.

The prolific quality of the rivers in South America induces many of the natives to resort to their banks, and to depend almost entirely for nourishment on what their waters so abundantly supply. But this mode of life requires so little enterprise or ingenuity that the petty nations adjacent to the Marañon and Orinoco are far inferior, in point of activity, intelligence, and courage, to the tribes which principally depend upon hunting for their subsistence. To form a just estimate of the intellectual capacities of the American, he must be seen when following the exciting pursuits of the chase.

While engaged in this favourite exercise, he shakes off his habitual indolence, the latent powers and vigour of his mind are roused, and he becomes active, persevering, and indefatigable. His sagacity in finding his prey is only equalled by his address in killing it. His reason and his senses being constantly directed to this one object, the former displays such fertility of invention and the latter acquire such a degree of acuteness, as appear almost incredible. He discerns the footsteps of a wild beast, or detects it among the dark foliage, where its vestiges or presence would escape every other eye; he follows it with certainty through the pathless forest, and is able to subsist where the best European hunter would perish from want. If he attacks his game openly, his fatal arrow seldom errs from the mark; if he endeavours to circumvent it by art, it is almost impossible to avoid his toils.

Among several tribes the young men are not permitted to marry until they have given such proofs of their skill in hunting as put it beyond doubt that they are capable of providing for a family. Their ingenuity, always on the stretch and sharpened by emulation, as well as necessity, has struck out many inventions which greatly facilitate success in the chase.

Slow, and with noiseless step, so as scarcely to disturb the fallen leaves beneath his feet, the wily Macusi Indian approaches. His weapons are strong, and peculiar, and of so slight an appearance as to form a strange contrast to their terrific power. A colossal species of Bamboo (*Arundinacea Schomburgkii*), whose perfectly cylindrical culm often rises to the height of fifteen feet from the root before it forms its first knot, furnishes him with his blow-pipe; and the slender arrows which he sends forth with unerring certainty of aim, are made of the leaf-stalks of a species of palm tree (*Maximiliana regia*), hard and brittle, and sharp-pointed as a needle. You would hardly suppose these fragile missiles capable of inflicting the slightest wound at any distance, and yet they strike more surely and effectively than the rifleman's bullet, for their point is dipped in the deadly juice of the Strychnos Urari, whose venomous powers are not inferior to those of the bush-master's fang.

In vain, suspended by his prehensile tail, the Miriki, the largest of the Brazilian monkeys, retires to the highest

forest trees ; in vain the sloth clings like a heap of moss to the bough ; touched by the fatal poison they both let go their aerial hold, and their lifeless bodies, whizzing through the air as they drop down, fall with a loud crash to the ground.

In a diluted form the wourali poison merely benumbs or stuns the faculties without killing, and is thus made use of by the Indians when they wish to catch an old monkey alive, and tame him for sale. On his falling down senseless, they immediately suck the wound, and wrapping him up in a strait jacket of palm leaves, dose him for a few days with sugarcane juice or a strong solution of saltpetre. This method generally answers the purpose, but should his stubborn temper not yet be subdued, they hang him up in smoke. Then, after a short time, his useless rage gives way, and his wild eye, assuming a plaintive expression, humbly sues for deliverance. His bonds are now loosened, and even the most unmanageable monkey seems to forget that he ever roamed at liberty in the boundless woods.

It is chiefly on the Camuku mountains in Guiana that the formidable Urari plant is found, whose sombre-coloured, brown-haired leaves and rind seem by their sinister appearance to betray its deadly qualities.

The savage tribes of the South American woods know how to poison their arrows with the juices of various other plants, but none equals this in virulence and certainty of execution, and yearly the Indians of the Orinoco, the Rio Negro, and even of the Amazons, wander to the Camuku mountains to purchase by barter the renowned Urari or Wourali poison of the Macusis. Nature has vouchsafed to these sons of the wilderness an inestimable gift in these venomous juices, which she has instilled in various plants of the forest, for by no other means would they be able to kill the birds and monkeys on whose flesh they chiefly subsist. How, or at what time, they made the discovery of their powers is unknown ; at all events the combination of so many means for the attainment of the end in view—the preparation of the poison, the blow-pipe, and the arrows—denotes a high degree of ingenuity.

The tropical Indians are generally as free from the incumbrance of dress as it is possible to conceive, paint seeming to be looked upon as a sufficient clothing. Red, furnished by the

pulp of the fruits of the Arnatto, or by the leaves of the *Bignonia Chica*, is the favourite colour, with which some tribes only besmear their faces, while others, who command a greater abundance of the material, not only paint their whole bodies, but even their canoes, their stools, and other articles of furniture. Red, yellow, and black are sometimes disposed in stripes, or in regular patterns, which it requires much time and patience to draw. The labour bestowed upon these paintings is the more to be wondered at, as a strong rain suffices to efface them. Some nations only paint when they are about to celebrate a festival, others are thus decorated the whole year round, and would be as ashamed to be seen unpainted as a European to appear unclothed.

The use of ornaments and trinkets of various kinds is almost confined to the men. 'A circlet of parrot and other gaudily-coloured feathers is worn round the head, but generally only on festive occasions. Tattooing is not so general or so elaborate as among the nations of the Malayan race, or the wild aboriginals of Australia.

The religion of the American Indians, if such it may be called, is of the lowest description. Some tribes, indeed, acknowledge a good principle, called *Cachimana*, who rules the seasons and causes the fruits of the earth to ripen; but, thankless for the benefits they enjoy, they pay far greater reverence to the evil principle, *Tolokiamo*, who, though not so powerful, is more cunning and active. The forest-Indians can hardly understand church and image worship. 'Your God,' they say to the Catholic missionaries, 'shuts himself up in a house as if he were old and infirm; ours is in the forest, in the fields, in the mountains whence comes the rain.'

The moon is universally considered as the abode of the blessed, as the land of abundance. The Esquimo, for whom a plank thrown by the current on his treeless shore is a treasure, sees in the moon extensive plains covered with forests, while the Indian of the Orinoco perceives in its shining orb grassy savannahs, exempt from all insect plagues. 'How pleasant it must be to live in the moon,' said a Salina-Indian to Father Gumilla; 'she is so beautiful and bright that surely no mosquitos can be there.' Thus man is always disposed to transfer

to some distant spot the seat of a felicity denied to him on earth.

On the banks of the Orinoco and the Amazons no idols are worshipped, but the Botuto, the holy trumpet, is the great object of veneration. The Piaches, priests or medicine-men who have taken it under their care, and who, to be initiated in its mysteries are obliged to submit to fasts, scourging, and other painful or self-denying religious practices, carry it under the palm trees where, as they pretend, its sound ensures a rich harvest for the following year. Sometimes the great spirit Cachimana blows the trumpet himself, at others he makes known his will through the guardians of the sacred instrument. No woman is allowed to see it on pain of death, but hurries away when the sound of it is heard approaching through the woods, and remains invisible till after the ceremony is over, when the instrument is taken away to its hiding-place, and the women come out of their concealment. Some of these Botutos are particularly renowned and venerated by more than one tribe. Sometimes offerings of fruits and palm-wine are deposited near them, and prove, no doubt, very acceptable to the Piaches.

The wild Indians who people the vast forests and llanos of Brazil and Guaiana generally live in small hordes, separated from each other by mutual distrust, and often by open war. Their enmity is aggravated by the circumstance that even the neighbouring tribes speak totally different languages. Though when they first settled along the river-banks of tropical America they probably spoke one tongue; yet, lost in interminable woods, where sometimes a single mountain or a few miles of forest are an almost impervious barrier between hordes which, to communicate with each other, would require a few days' navigation through a labyrinth of streams, mere dialects in process of time became separate languages, which from their dissimilarity perpetuate discord and hatred. The Indians avoid each other because they do not understand each other, and a mutual distrust and fear is the cause of their mutual animosity. Some of the Orinoco tribes, as for instance the Ottomacas and the Yaruras, are nomadic savages, the outcasts of humanity; others, like the Maquiritani and the Macos, are of milder manners, and live in fixed settlements, on the products of the soil.

The Ottomacas, of whom it is said by other Indians, 'that there is nothing so disgusting that they will not eat,' live the greater part of the year on fishes and turtles; but when the Orinoco and its tributaries swell during the periodical rains and render fishing next to impossible, they become '*dirt-eaters*' and assuage their hunger with an unctuous clay. Such is their predilection for this strange aliment, in which chemistry detects no trace of organic matter, that even in times of abundance they mix some of it with their more nutritious food. The most remarkable fact is that during the two months of the year when they daily devour about three-quarters of a pound of clay, and are restricted to a meagre supply of vegetable or animal provisions, such as lizards, ants, and gum, the Ottomacas still remain healthy and strong, and never complain of indigestion. These barbarians are ugly, wild, vindictive; and, besides being passionately fond of palm-wine and maize-spirit, use the powdered pods of a leguminous plant, the *Acacia Niopo*, as a means of intoxication. The hollow bone of a bird serves as a kind of pipe, through which they sniff up the powder, which is so irritating that a small quantity produces a strong fit of sneezing in those who are not accustomed to it. The effect of the *Niopo* is to deprive them for a couple of hours of their senses, and to render them furious in battle. Such is their malignant ingenuity that they poison their sharpened thumb-nails with the *Wourali*, so as to be able to inflict a death-wound with the slightest scratch, and such their tiger-like ferocity that they suck with fiendish delight the blood of their slain enemies. The country these wretches inhabit is described as romantically beautiful, a mournful contrast to a state of society where man is eternally armed against man. Such is the miserable state of insecurity of the weaker tribes that, when they approach a river's bank, they carefully destroy with their hands the vestiges of their timid footsteps.

During the rainy season the swollen Orinoco, like the Amazons and other great streams, frequently undermines the trees on his banks, and carries them along on his turbid waters. These natural floats, covered with a profusion of parasites and climbing plants, form so many swimming islands, pleasing to the eye, but extremely dangerous to navigation; for woe to the pirogue which at night is caught in their intricate network of

roots and branches! When the Indians wish to surprise a hostile horde they bind several canoes together and, concealing them under a covering of herbs and foliage, thus imitate the natural floats of the Orinoco.

Lurking, like murderous reptiles, under a canopy of verdure, the current carries them towards the unsuspecting objects of their stratagem, and they send forth the poisoned dart ere the enemy is aware of their approach. How happy might all these nations be if they would but apply to the arts of peace and improvement, the intelligence they waste upon the purposes of war!

Where the hordes are so small and the causes of destruction so great, it cannot be wondered at that whole tribes die away like single families, and come to be numbered among the beings of the past. Thus the Atures, who gave their name to the far-famed cataracts of the Upper Orinoco, are now no more, and, strange to say, the last words of their language were heard from the lips not of the last survivor of their race, but from those of a parrot. The Atures are also interesting from their careful mode of sepulture, in a burial cavern thus described by Humboldt: 'The most remote part of the valley is covered by a thick forest. In this shady and solitary spot, on the declivity of a steep mountain, the cavern of Atariupe opens itself. It is less a cavern than a jutting rock in which the waters have scooped a vast hollow; when, in the ancient revolutions of our planet, they attained that height. We soon reckoned in the tomb of a whole extinct tribe nearly six hundred skeletons, well preserved, and so regularly placed that it would have been difficult to make an error in their number. Every skeleton reposes in a sort of basket made of the petioles of the palm tree. These baskets, which the natives call *mapurès*, have the form of a square bag; their sizes are proportioned to the age of the dead; there are some for infants cut off the moment of their birth: we saw them from ten inches to three feet long, the skeletons in them being bent together. The bones, not one of which is wanting, have been prepared in three different manners, either whitened in the air and the sun, or dyed red with *arnatto*, or, like real mummies, varnished with odoriferous resins, and enveloped in leaves of the heliconia or plantain tree. The Indians related to us that the fresh corpse is placed in damp

ground, in order that the flesh remaining on the bone may be scraped off with sharp stones. Several hordes in Guiana still observe this custom. Earthen vases, half-baked, are found near the mapurès or baskets; they appear to contain the bones of the same family. The largest of the vases, or funeral urns, are three feet high and five feet and a half long. Their colour is greenish-grey, and their oval form is sufficiently pleasing to the eye. The handles are made in the shape of crocodiles or serpents; the edge is ornamented with meanders, labyrinths, and straight lines variously combined.' When the reverence paid to the dead thus called forth the first germs of art, there surely must have been affectionate feelings of regret and sorrow, which raised the Atures above the level of mere callous savages, and add a melancholy interest to their extinction.

The Indians of the Amazons valley appear to be much superior, both physically and intellectually, to those of South Brazil and of most other parts of South America. Their superb figures generally equal the finest statues in beauty of outline; their broad chests exhibit a splendid series of convex undulations without a hollow in any part of it. The sons of a delicious climate, their bodies, invigorated by exercise, and enjoying from infancy an unconstrained liberty of action, show the perfection to which the human form may attain when circumstances favour its development. Such is the number of their tribes that Mr. Wallace enumerates no less than thirty along the bank of the River Uaupes, one of the tributaries of the Rio Negro, having almost all of them some peculiarities of language and custom, but all going under the general name of Uaupes, and distinguishing themselves as a body from the inhabitants of other rivers.

All these tribes construct their dwellings after one plan, which is peculiar to them. Their houses, formed in the shape of a parallelogram with a semicircle at one end, are the abode of numerous families, sometimes of a whole tribe. The roof is supported on the columnar trunks of palm trees. In the centre a clear opening is left, twenty feet wide, and on the sides are little partitions of palm-leaf thatch, dividing off rooms for the several families. These houses are built with much labour and skill; the main supports, beams, rafters, and other parts, are straight, well-proportioned to the strength required, and bound together with split creepers, in a manner that a sailor would

admire. The thatch is of the leaf of some one of the numerous palms so well adapted to the purpose, and is laid on with great compactness and regularity. The walls, which are very low, are formed also of palm-thatch, but so thick and so well bound together that neither arrow nor bullet will penetrate it. At the gable end is a large doorway, from the top of which hangs a palm mat, supported by a pole during the day, and let down at night. A smaller door at the semicircular end is the private entrance of the chief, to whom this part of the house exclusively belongs. The furniture consists principally of hammocks, made of string twisted from the fibres of the leaves of the *Mauritia flexuosa*, of pots and cooking utensils made of baked clay, and of great quantities of small saucer-shaped baskets.

Tattooing is very little practised by the Uaupes; they all, however, have a row of circular punctures along the arm, and one tribe, the Tucanos, are distinguished from the rest by three vertical blue lines on the chin. They also pierce the lower lip, through which they hang three little threads of white beads. All the tribes bore their ears, and wear in them little pieces of grass ornamented with feathers. The Cobeus alone expand the hole to so large a size that a bottle cork could be inserted. The dead are almost always buried in the houses, but several tribes have the horrid custom of disinterring the corpse about a month after the funeral, and putting it in a great oven over the fire till all the volatile parts are driven off with an intolerable stench. The black carbonaceous mass which remains is then pounded into a fine powder and mixed in several large vats of caxiri, or maize-beer. This is drunk by the assembled company till all is finished, for they imagine that thus the virtues of the deceased will be transmitted to the drinkers.

The belief, which is also common among the Negroes, that death in the prime of life does not proceed from a natural cause, but is owing to the evil practices of some enemy, leads to the same fatal consequences. Some poison given at a festival in a bowl of caxiri is generally used to avenge the dead; this is of course again retaliated—on perhaps the wrong party—and thus a long succession of murders may result from what at first was a mere groundless suspicion.

The Macus, one of the lowest and most uncivilised tribes of

Indians in the Amazons district, lead a vagrant life similar to that of the African Bushmen, but with this advantage—that they have greater facility in procuring food, and live in a country abounding in water. They have no fixed place of abode, but sleep at night on a bundle of palm leaves, or stick up a few leaves to make a shed if it rains, or sometimes with bush-ropes construct a rude hammock, which, however, serves only once. They eat all kinds of birds and fish, roasted or boiled in palm spathes, and all sorts of wild fruits. They have little or no iron, and use the tusks of the wild pig to scrape and form their bows and arrows, which they anoint with poison. As the Bushmen do with their neighbours, they often attack the houses of other Indians, situated in solitary places, and are consequently equally detested by the surrounding tribes.

On the banks of the Purus we find the Purupurus, who are almost all afflicted with a cutaneous disease, consisting in the body being spotted and blotched with white, brown, or nearly black patches of irregular size and shape, and having a very disagreeable appearance. When young their skins are clear, but as they grow up they invariably become more or less spotted. Their houses are of the rudest construction, like those of our gipsies, and so small as to be set up on the sandy beaches and carried away in their canoes whenever they wish to move. These canoes are likewise extremely primitive, having a flat bottom and upright sides—a mere square box, and quite unlike those of all other Indians. But what distinguishes them yet more from their neighbours is that they use neither the blow-pipe nor bow and arrow, but have an instrument called a 'palheta,' which is a piece of wood with a projection at the end, to secure the base of the arrow, the middle of which is held with the handle of the palheta in the hand, and thus thrown as from a sling; they have a surprising dexterity in the use of this weapon, and with it readily kill game, birds, and fish. They sleep in their houses, on the sandy beaches, making no hammocks nor clothing of any kind; they make no fire in their houses, which are too small, but are kept warm in the night by the number of persons in them. In the wet season, when the banks of the river are all flooded, they construct rafts of trunks of trees bound together with creepers, and on them erect their huts, and live there till the waters fall

again, when they guide their raft to the first sandy beach that appears.

In the country between the Tapajoz and the Madeira, among the labyrinths of lakes and channels of the great island of the Tupinambanos, reside the Mandrucus, the most warlike Indians of the Amazons. These are probably the only perfectly tattooed nation in South America. The markings are extended all over the body; they are produced by pricking with the spines of a palm, and rubbing in the soot from burning pitch, to produce an indelible bluish tinge.

They build their houses with mud walls in regular villages, and, though very agricultural, make war every year with an adjoining tribe, the Parentintins, taking the women and children for slaves, and preserving the dried heads of the men in a large building or barrack, where all the men sleep at night, armed with their bows and arrows ready in case of alarm.

One of the singular facts connected with these Indians of the Amazons valley is the resemblance which exists between some of their customs and those of nations most remote from them.

The blow-pipe re-appears in the sumpitan of Borneo; the great houses of the Uaupes closely resemble those of the Dyaks of the same country, while many small baskets and bamboo boxes from Borneo and New Guinea are so similar in their form and construction to those of the Amazons that they would be supposed to belong to adjoining tribes. Then again the Mandrucus, like the Dyaks, take the heads of their enemies, smoke-dry them with equal care, preserving the skin and hair entire, and hang them up around their houses. In Australia the throwing-stick is used, and on a remote branch of the Amazons we see a tribe of Indians differing from all around them in substituting for the bow a weapon only found in such a remote portion of the earth, among a people differing from them in almost every physical character. How can such similarities be accounted for? Do they result from some remote and unknown connection between these nations, or are they mere accidental coincidences produced by the same wants acting upon people subject to the same conditions of climate, and in an equally low state of civilisation?

The Caribs, whom the cruelty of the Spaniards extirpated in

the Lesser Antilles, still exist in a variety of tribes from the mouth of the Amazons to Lake Maracaybo. They are distinguished by an almost athletic stature, by a stately demeanour, and an intense national pride, for, remembering the times when they overran a considerable part of South America, they still consider themselves as a superior race. When a Carib enters the hut of another Indian he does not wait till food is offered him, but, looking round with a haughty mien, seizes what pleases him best, as if it were his own by right. Arrogant and tyrannical towards strangers, he is equally so towards his wives, and it would be difficult to find a Carib woman who does not show in numerous scars and wounds the marks of her husband's brutality.

In point of intelligence, the Caribs are surpassed by no other Indians. They are excellent orators, and the earnest dignified manner in which they deliver their speeches shows them to be capable of a high degree of civilisation.

Among the tribes of Southern Brazil the Botocudos, who inhabit the primeval forests on the banks of the rivers Pardo, Doce, and Belmonte, are the most remarkable. The custom of piercing the ears and underlip for the purpose of inserting some ornament is found among many other nations, both of the Old and the New World, but nowhere is it carried to such an excess as among the Botocudos. At an early age pieces of round light wood, first small and gradually larger, are inserted into the apertures, until at length the ears almost reach down to the shoulders, and the lip, distended into a narrow rim, is made to project to a distance of seven or eight inches. At a later age, when the muscular fibres begin to lose their elasticity, it hangs down, and as, in consequence of the pressure of the wood, the front teeth soon fall out, it is hardly possible to conceive anything more hideous than a face thus artificially deformed. To add, probably, to their beauty, these savages shave their hair so as to leave but a small crown or tuft on the top of the head. The wourali is not in use among them, but their enormous bows and long sharp arrows render them formidable to their neighbours. A Botocudo, with his sharp eye and muscular arm, accustomed from infancy to the use of these murderous weapons, is indeed a greater object of terror in the gloomy impervious forest than the jaguar or the snake. When a horde,

after having exhausted the neighbourhood of its game, is obliged to migrate to some other quarter, its removal is easily effected. A few dried palm-leaves alone remain to indicate the spot where the savages had fixed their dwellings, and soon even these slight vestiges disappear. In the primitive forest man, indeed, passes away like a shadow,

‘Sicut navis, quasi nubes, velut umbra,’

and leaves no more traces of his existence than the wild animals which he chased.

In these migratory journeys the heaviest burdens fall to the share of the women, who, besides a large heap of household articles, tied up in a bag of network, are often still obliged to carry a child on their back. Thus encumbered, they manage to cross small rivers on bridges of a very primitive construction. A cable made of bush-ropes is loosely suspended over the surface of the stream, and on this they walk, holding themselves by another cable similarly hung at a greater height.

The Botocudos are cannibals, like many other American tribes. After a battle they feast upon the dead bodies of their enemies, but more, it seems, from a spirit of vindictive rage than from a depraved taste for human flesh.

When a Botocudo dies he is quickly buried in or near his hut, and then the place is forsaken. On the first day the tribe shows its grief by a wild howling, but on the second it pursues its usual occupations. No food, or weapon, or ornament is interred with the corpse, but for some time a fire is kindled on each side of the grave, to scare away the evil spirit ‘Tanchon,’ who would otherwise rob it of its contents. From fear of this imaginary being the fierce Botocudo, who trembles at nothing that lives, is afraid to sleep alone in the forest, and anxiously seeks before night the society of his comrades.

## CHAPTER VIII.

## THE MEXICAN PLATEAUS, AND THE SLOPES OF SIKKIM.

Geological Formation of Mexico—The *Tierra Caliente*—The *Tierra Templada*—  
The *Tierra Fria*.

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The Sylvan Wonders of Sikkim—Changes of the Forest on ascending—The  
Torrid Zone of Vegetation—The Temperate Zone The Coniferous Belt—  
Limits of Arboreal Vegetation—Animal Life.

THE prodigious height attained in the torrid zone, not only by single mountains, but by vast tracts of land, and the diminution of temperature which is the necessary consequence of their elevation above the level of the sea, enable the inhabitants of many tropical countries, without leaving their native land, to view the vegetable forms of every zone, and to pluck nearly every fruit that is found between the equator and the arctic circle. In Asia, Africa, and America, in the islands of the Indian Archipelago, and in the Hawaiian group, where the Mauna Loa towers to the height of Mont Blanc, and girdles his foot with palms, while snow rests for a great part of the year upon his summit, we find numerous examples of a rapid transition from the torrid to the temperate or frigid zone, often within the range of a single day's journey.

It would far exceed my limits were I to attempt to follow all these gradations of climate throughout the wide extent of the tropics; but a short description of the Mexican plateaus, and of the slopes of Sikkim, which I have selected as remarkable instances of the wonderful change of vegetation resulting from the progressive elevation of the land, will, I hope, prove not uninteresting to the reader.

After traversing South America and the Isthmus of Darien,

the giant chain of the Andes spreads out, as it enters Mexico, into a vast sheet of table-land, which maintains an elevation of from 6,000 to 9,000 feet for the distance of 200 leagues, until it gradually declines in the higher latitudes of the north, or descends in successive stages to the sea-board of the Atlantic. To this remarkable geological formation the land, though warmed during a part of the year by the rays of a vertical sun, owes that astonishing variety of climate and productions which would make it the envy of the earth, if peopled by a race that knew better how to utilize the gifts of Nature.

All along the Mexican Gulf stretches a broad zone of lowlands, called the *tierra caliente*, or hot region, which has the usual high temperature of the tropics. Parched and sandy plains, dotted with mimosas and prickly opuntias, are intermingled with savannahs, and woodlands of exuberant fertility.

The branches of the stately forest trees are festooned with clustering vines of the dark purple grape, convolvuli, and other flowering parasites of the most brilliant dyes. The undergrowth



CARDINAL.

of prickly aloe, matted with wild rose and honeysuckle, makes in many places an almost impervious thicket. In this wilderness of sweet-smelling buds and blossoms flutter birds of the parrot tribe, and clouds of butterflies, whose colour, nowhere so gorgeous as here, rival



MOCKING-BIRD.

those of the vegetable world ; while birds of exquisite song,—the scarlet cardinal, and the mocking-bird that comprehends in his own notes the whole music of a forest,—fill the air with melody.

But, like the genius of evil, the malaria engendered by the decomposition of rank vegetable substances in the hot and humid soil, poisons these enchanting retreats, and from the spring to the autumnal equinox renders them dangerous or fatal to man.

Hastening to escape from its influence, the traveller, after passing some twenty leagues across the dreaded region of the yellow-fever, finds himself rising into a purer atmosphere. His

limbs recover their elasticity. He breathes more freely, for his senses are not now oppressed by the sultry heats and intoxicating perfumes of the lowlands. The aspect of nature, too, has changed, and his eye no longer rests on the gay variety of colours with which the landscape was painted there. The vanilla, the indigo, the chocolate-tree disappear as he advances, but the sugar-cane and the glossy-leaved banana still remain; and when he has ascended about four thousand feet, he sees, in the unchanging green and the rich foliage of the liquidambar-tree, that he has reached the height where clouds and mists settle in their passage from the Mexican Gulf, and keep up a perpetual moisture.

He is now beyond the influence of the deadly *vomito* on the confines of the *tierra templada*, or temperate region, where evergreen oaks begin to remind him of the forests of central Europe. The features of the scenery become grand, and even terrible. His road sweeps along the base of mighty mountains, once gleaming with volcanic fires, and still glistening in their mantles of snow, which serve as beacons to the mariner for many a league at sea. All along he beholds traces of their ancient combustion as his road passes over vast tracts of lava, bristling in the fantastic forms into which the fiery torrent has been thrown by obstacles in its career. Perhaps at the same moment, as he casts his eyes down one of those unfathomable ravines or barrancas, which often, to a depth of more than 1,200 feet, rend the mountain-side, he sees its sheltered and sultry recesses glowing with the rich vegetation of the tropics: as if these wonderful regions were anxious to exhibit, at one glance, the boundless variety of their flora. Cactuses, euphorbias, and dracænæ, with a multitude of minor plants, cling to the rocky walls; while in the depth of the gorge stand huge laurels, fig-trees, and bombacææ, whose blossoms exhale almost overpowering odours, and whose trunks are covered with magnificent creepers, expanding their gay petals in the torpid air. Still pressing upwards, he mounts into regions favourable to other kinds of cultivation. He has traced the yellow maize growing from the lowest level; but he now first sees fields of wheat and the other European cereals, brought into the country by the Spanish conquerors, and with these, plantations of the American agave, which, among other uses,

provides the Mexican with his favourite beverage. The oaks acquire a sturdier growth; and at an elevation of about eight thousand feet, the dark forests of pine announce that he has entered the *tierra fria*, or cold region,—the third and last of the great natural terraces into which the country is divided.

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Loaded with vapours, the prevailing southerly sea-winds, after crossing the dead level occupied by the delta of the Ganges and Burrampooter, strike against the mountain-spurs of Sikkim, the dampest region of that stupendous chain, and expending their moisture on their flanks, clothe them with a thick mantle of verdure to an enormous height. The giant peaks of Donkiah, Kinchingow, and Kinchinginga, the third great mountain of the world (28,178 feet), form the culminating points of this magnificently wooded region, and look down upon the dense forests which, varying as they rise, extend between the plains of Bengal and their own perpetual snows.

Dark green woods, of an exclusively tropical character, cover the valleys and declivities to a height of from 4,000 to 5,000 feet. Mighty palms rise above the mass of the forest, while innumerable shrubs cover the ground. The prevalent timber is gigantic, and scaled by climbing leguminosæ, bauhinias, and robinias, which sometimes sheathe the trunks, or span the forest with huge cables, joining tree to tree. Large bamboos rather crest the hills than court the deeper shade, of which there is abundance, for the torrents cut a straight and steep course down the hill-flanks. The gulleys which they traverse are choked by vegetation, and bridged by fallen trees, whose trunks are clothed with epiphytical orchids, pendulous lycopodia, ferns, pothos, peppers, vines, bignonias, and similar types of the hottest and dampest climates. The beauty of the drapery of the pothos leaves is pre-eminent, whether for the graceful folds of the foliage or for the liveliness of its colour. Of the more conspicuous smaller trees the wild banana is the most abundant, its broad crown contrasting with the smaller-leaved plants amongst which it nestles; next comes a screw-pine, with a straight stem and a tuft of leaves, each eight or ten feet long, waving on all sides.

At an elevation of about four thousand feet many plants of the temperate zone, increasing in numbers as the traveller

ascends, begin to mingle with the tropical vegetation, and to impart new charms to the forest; oaks and walnuts are here seen thriving near palms and arborescent ferns; mighty rhododendrons expand over thickets of tropical herbage; parasitical orchids adorn the trunks of the oaks, while thalictrons and geraniums blossom underneath.

At a height of about 7,000 feet the forest, assuming a decidedly temperate physiognomy, is chiefly composed of oaks, magnolias, chestnuts, laurels, and walnuts. In many parts arborescent rhododendrons prevail, and ferns are generally very abundant.

About 10,000 feet above the level of the sea begins a zone or belt of coniferæ, chiefly characterised by the silver fir (*Abies Webbiana*) and the *Abies Brunoniana*, a beautiful species, forming a stately pyramid, with branches spreading like the cedar, but not so stiff, and drooping gracefully on all sides. Only at intervals other trees, such as willows, magnolias, ashes, birches, poplars, apple and cherry trees, appear among the thick pine-woods. The shrubbery and herbaceous plants of this zone are representatives of the whole temperate flora of Europe and America, intermixed with many Chinese, Japanese, and Malayan plants in the richest variety. Several epiphytic orchids grow to an elevation of 10,000 feet, and large spaces are frequently occupied by rhododendrons, which either ascend from the temperate zone into the coniferous belt, or first appear in the latter. But very few trees, such as the willows, birches, maples, and ashes, rise above the coniferous forest, which reaches an upper limit of about 13,000 feet. Most arboreal plants now appear only in a dwarfed condition; but the willows still rise in powerful growth over the many Alpine shrubs—juniperus, rosa, lonicera, potentilla, rhododendron—which cover the ground; and single specimens, though low and stunted, are even found at a height of 16,000 feet.

The whole zone between the extreme limits of arboreal vegetation and the upper boundary of shrubs, generally occupies an elevation of from 13,500 to 16,000 feet, and may justly be called the region of the Alpine rhododendrons: these plants are here by far the most numerous, and frequently belt the mountains with a girdle of richly coloured blossoms, even to the verge of the perennial snows.

A large number of herbs, cruciferæ, compositæ, ranunculaceæ, grasses, sedges, grow and bloom beyond the limits of the shrubs, frequently forming luxuriant pastures, on which numerous herds of yacks or *grunting-oxen*, graze during the summer. Many plants are even exclusively confined to these enormous heights; such as the *Rhododendron nivale*, the most Alpine of woody plants, which Dr. Hooker found at 17,000 feet elevation, the *Delphinium glaciale*, and the *Arenaria rupifraga*, a curious species forming great hemispherical balls, and altogether resembling in habit the curious balsam-bog of the Falkland Islands, which thrives in similar scenes. While on the summits of the Swiss Alps, lichens but sparsely cover the rocks, wherever they are denuded of snow, the wanderer in Sikkim enjoys the sight of many a gay-coloured flower in regions 3,000 or 4,000 feet higher than the summit of Mont Blanc.

While thus in Sikkim a wonderful variety of vegetation rises in successive zones from the foot of the mountains to heights unparalleled in any other part of the world, animal life abounds only in its lower classes; for the higher orders appear only in few species, and in very scanty numbers. On ascending from the foot of the Himalaya, one is astonished at the silence of the woods, broken at intervals only by the voice of a bird, or



MUSK-DEER.

the chirping of a cicada. The solitude increases on penetrating into the interior of Sikkim, and is but rarely enlivened by a few monkeys in the valleys, some musk deer on the spare grass of the mountains, in heights of from 8,000 to 13,000 feet, or a few larks, sparrows, finches, pigeons, swallows, falcons, and other birds, some of which ascend to a surprising height.

The insects, however, and other invertebrata, make up, by their numbers, for the scarcity of warm-blooded animals, and are often insupportable plagues to the wanderer. Beautiful butterflies sometimes ascend to heights of 10,000 feet, along with the less agreeable mosquitoes and ticks, and in all the streams up to an elevation of 7,000 feet, hill leeches infest the waters in such multitudes that bathing is almost impossible.



AFRICAN BUSHMEN.

## CHAPTER IX.

### THE KALAHARI AND THE BUSHMEN.

Reasons why Droughts are prevalent in South Africa—Vegetation admirably suited to the Character of the Country—Number of Tuberos Roots—The Caffre Water-Melon—The Mesembryanthemums—The Animal Life of the Kalahari—The Bushmen, a Nomadic Race of Hunters—Their Skill in Hunting—Their Food—Acuteness of their Sight and Hearing—Their Intelligence and Perseverance—Their Weapons and Marauding Expeditions—Their Voracity—Their Love of Liberty—The Bakalahari—Their Love for Agriculture—Their Ingenuity in procuring Water—Trade in Skins—Their timidity.

**A** GEOGRAPHICAL position, not unlike that which condemns the plains along the western foot of the Peruvian and Bolivian Andes to perpetual aridity, renders also the greater part of tropical and sub-tropical Southern Africa subject to severe droughts, and in general to great scarcity of rain. For the emanations of the Indian Ocean, which the easterly winds carry towards that continent, and which, if equally distributed over the whole surface, would render it capable of bearing the richest productions of the torrid zone, are mostly deposited on the eastern slopes of the mountain-chains, which, under various denominations, traverse eastern South Africa from north to south; and when the moving mass of air, having crossed their highest elevations, reaches the great heated inland plains, the ascending warmth of that hot dry surface gives it greater power

of retaining its remaining moisture, and few showers can be given to the central and western lands. Thus, while the sea-board gorges of the eastern zone are clad with gigantic forests, and an annual supply of rain there keeps a large number of streams perpetually flowing, Damara Land, the Namaqua country, and the Kalahari, are almost constantly deprived of moving water.

From these general remarks it might be imagined that regions so scantily supplied with one of the prime necessities of life could be nothing but a dead and naked waste; yet, strange to say, even the great Kalahari, extending from the Orange river in the south, lat.  $29^{\circ}$ , to Lake Ngami in the north, lat.  $21^{\circ}$ , and from about  $24^{\circ}$  E. long. to near the west coast, has been called a desert simply because it contains no flowing streams and very little water in wells; as, far from being destitute of vegetable or animal life, it is covered with grass and a great variety of creeping plants, interspersed with large patches of bushes and even trees. In general, the soil is a light-coloured, soft sand; but the beds of the ancient rivers contain much alluvial soil, and, as that is baked hard by the burning sun, rain-water stands in pools in some of them for several months in the year.

The abundance of vegetation on so unpromising a soil may partly be explained by the geological formation of the country; for as the basin-shape prevails over large tracks, and as the strata on the slopes where most of the rain falls dip in towards the centre, they probably guide water beneath the plains, which are but ill-supplied with moisture from the clouds.

Another cause, which serves to counteract the want or scarcity of rain, is the admirable foresight of Nature in providing these arid lands with plants suited to their peculiar climate. Thus creepers abound which, having their roots buried far beneath the soil, feel but little the effects of the scorching sun. The number of these which have tuberous roots is very great—a structure evidently intended to supply nutriment and moisture when, during the long droughts, they can be obtained nowhere else.

One of these blessings to the inhabitants of the desert is the Leroshua, a small plant with linear leaves, and a stalk not thicker than a crow's quill; but on digging down a foot or

eighteen inches beneath, the root enlarges to a tuber, often as big as the head of a young child, which, on the rind being removed, is found to be a mass of cellular tissue, filled with fluid much like that in a young turnip. Owing to the depth beneath the surface at which it is found, it is generally deliciously cool and refreshing. Another kind, named *mokuri*, is seen in other parts of the country, where long-continued heat parches the soil. This plant is an herbaceous creeper, and deposits under ground a number of tubers, some as large as a man's head, often in a circle, a yard or more horizontally from the stem. The natives strike the ground on the circumference of the circle with stones, till, by hearing a difference of sound, they know the water-bearing tuber to be beneath. They then dig down a foot or so and find it.

But the most wonderful plant of the desert is the Kengwe, the water-melon of the Caffres. In years when more than the usual quantity of rain falls, vast tracts of the country are literally covered with these juicy gourds, and then animals of every sort and name, including man, rejoice in the rich supply.

The creeping plants of the desert serve, moreover, a double purpose; for, besides their use as food, they fix, by means of their extensive ramifications, the constantly shifting sands—thus rendering similar services to those of the sand-reed (*Amphiphila arundinacea*) on the dunes along the sandy coasts of the North Sea.

The Mesembryanthemums are another family of plants admirably adapted to the Kalahari, as their seed-vessels remain firmly shut while the soil is hot and dry, and thus preserve the vegetative power intact during the highest heat of the torrid sun; but when rain falls, the seed-vessel opens and sheds its contents, just when there is the greatest likelihood of their vegetating. This is the more wonderful, as in other plants heat and drought cause the seed-vessels to burst and shed their charge.

One of this family possesses a tuberous root, which may be eaten raw; and all are furnished with thick, fleshy leaves, with pores capable of imbibing and retaining moisture from a very dry atmosphere and soil; so that if a leaf is broken during the greatest drought it shows abundant circulating sap.

The peculiar and comparatively abundant vegetation of the

arid plains of South Africa explains how these wastes are peopled by herds of herbivorous animals, which in their turn are preyed



KOODOO.

upon by the lion, the panther, or the python. Hundreds of elands (*Boselaphus oreas*) gemsbucks, koodoos, (*Strepsiceros capensis*), or duikers (*Cephalopus mergens*), may often be seen thirty or forty miles from the nearest water. These, having sharp-pointed hoofs well adapted for digging, are able to subsist without water for many months at a time, by living on moist bulbs and tubers; while the presence of the rhinoceros, of the

buffalo and gnu (*Catoblepas Gnu*), of the giraffe, the zebra, and pallah (*Antilope melampus*), is always a certain indication of water being within a distance of seven or eight miles.

The tribes of the Kalahari consist of Bushmen, probably the aborigines of the southern part of the continent, and of Bakalahari, the remnants of an ancient Bechuana emigration.

The diminutive Bushman occupies nearly the lowest degree in the scale of humanity. Equalled in size by the Chimpanzee, far surpassed by the Gorilla, and with as little prominence of the nasal bone as in those highest of the *Simiæ*, he nevertheless walks erect, and by the equal and uninterrupted series of his comparatively small teeth, by his well-developed great toe and the large opposable thumb, by his plantigrade foot and prehensile hand, vindicates his claim to the genus man. Inhabiting the arid deserts of South Africa, from the confines of the Cape Colony to the banks of the Zambesi, or possibly even as far north as the valley of the Nile, he is the only real nomad in South Africa, as the scanty means of subsistence the land affords compel him to a life of constant wandering. He never cultivates the soil excepting perhaps for the sake of a little dacha or wild hemp for smoking, nor rears any domestic animal save wretched dogs. As a hunter he rivals the American Indian in his intimate acquaintance with the habits of the game, and the skill he evinces in their capture. He follows them in their migrations from place to place, and proves as complete a check upon

their inordinate increase as the other carnivora. When game is scarce, he manages to live on bulbs, snakes, lizards, termites, ants' eggs, locusts, and any other garbage he can get. Inured to every privation, he equals the camel in his endurance of hunger and thirst, and will remain for days without tasting a drop of water, except such as is contained in the pulp of succulent plants. His refuge at night is some natural cave or self-made burrow, or the shelter of a bush, where, covered with the skin of a sheep or antelope, he rests like a wild animal in his lair.

It may naturally be supposed that a life like this must act unfavourably on his physical development; but, though apparently weak, his meagre body is capable of great exertion. His sight and hearing are remarkably acute, as he is constantly practising them in the pursuits of the chase; but it would almost seem as if he were devoid of taste, smell, and feeling, for he expresses no disgust at the most loathsome food, and is quite insensible to all changes of temperature.

When each individual only seeks the momentary gratification of his first animal wants, without any thought of the future, the ties of society must necessarily be very slack. Thus, the whole nation is subdivided into small hordes or families, and even these are frequently forced to separate as the same place does not afford sufficient nourishment for all. There is no distinction of hereditary rank; bodily strength is the only quality conferring superiority, and enables its fortunate possessor to tyrannize over his weaker companions.

Though occupying about the same rank in the human family as the Fuegians, and leading a mere brute existence, the Bushmen give many proofs of intelligence. They are with difficulty roused to exertion, but when they have once conquered their habitual laziness, an uncommon perseverance characterises all their undertakings. Nothing will induce them to quit the spoor of an animal they have once pursued; they will dig for days in places where they expect to find some water.

Both in the fabrication and the use of their weapons, they show great ingenuity and skill. Like the South American Indians, they understand the art of poisoning their arrows, which scarcely ever miss the mark within a distance of eighty paces; they also have recourse to pitfalls, poisoned water, and other stratagems. In the art of surprising their game, they can

hardly be surpassed. It is not an easy task, in the midst of a naked plain, to avoid the eye of the shy antelope or of the far-sighted ostrich, so as to be able to approach them within a distance of fifty or sixty paces. This, however, they perform, by slowly creeping along almost on their bellies, by strewing dust over their bodies, so as not to be betrayed by any difference of colour, and by remaining motionless as soon as the animal shows any marks of attention. This tedious pursuit often lasts several hours, without ever tiring their patience; and the prey thus tracked, however swift and wary, but seldom escapes them.

In the marauding expeditions which they frequently undertake for the purpose of stealing the cattle of their neighbours, the Caffres, Bechuanas, or Boors—for, having no property themselves, they have little regard for the property of others—they show no less expertness and cunning, never venturing an attack before having first carefully spied out every circumstance, and taken every precaution to ensure success. At the time of the last quarter of the moon, their thefts are most to be feared, for they then execute their robberies in the dark before midnight, and afterwards profit by the moonlight for a more rapid flight.

Their physiognomy has the characteristic traits of the Hottentot race, but their eye is infinitely more sharp and wild, their countenance more expressive and intelligent, and all their gestures more lively—a difference caused, no doubt, by the greater mental and bodily actions to which a life full of hardships and privations constrains them.

As may be imagined from the few ideas it has to express, their language is very poor, and, on account of its peculiar and characteristic click and its harsh gutturals, more resembles the screeching of an animal than a human idiom.

When a horde has been successful in some hunting or marauding expedition, it keeps the fact as secret as possible, for as soon as the intelligence spreads, everyone hastens to the spot to come in for his share of the feast.

For fear of being obliged to divide with others, the prey is devoured as fast as possible, with inconceivable gluttony, and what cannot be used is instantly destroyed, merely from the dog-in-the-manger motive, to keep others from its enjoyment. When, for instance, the Bushmen have found a nest of ostrich

eggs, and circumstances will not allow of their remaining on the spot, they take away as many as they can carry, and break the rest; or, when they meet with a great herd of spring-bocks, they will wound as many as possible with their poisoned arrows, though six or eight would suffice them with food for many days. It is a state of society like that to which, probably, the communists would reduce civilized Europe, if their insane doctrines could ever be realized. Despite the many privations they have to endure, the Bushmen prefer the utter freedom of the desert to the constraint of an agricultural and pastoral life. They live in the Kalahari by choice, the Bakalahari from compulsion, and both possess an intense love of liberty.

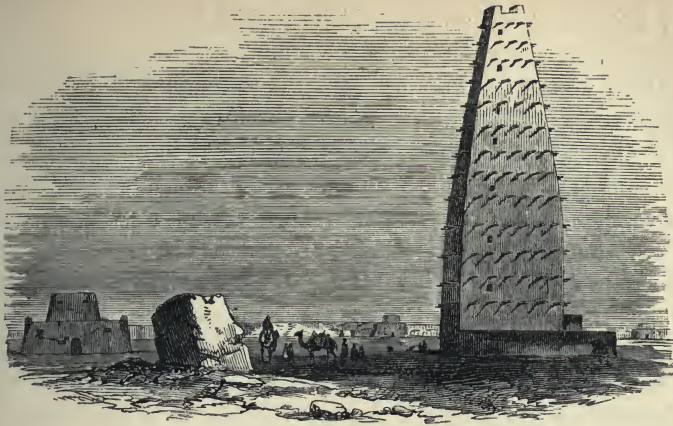
The Bakalahari are traditionally reported to be the oldest of the Bechuana tribes driven into the desert by a fresh migration of their own nation. Though living ever since on the same plains with the Bushmen, under the same influences of climate, enduring the same thirst, and limited to the same scanty food for centuries, they still retain in undying vigour the Bechuana love for agriculture and domestic animals, hoeing their gardens annually, though often all that they can hope for is a supply of melons and pumpkins, and carefully rearing small herds of goats, although to provide them with water is a task of no small difficulty, since the dread of hostile visits from the adjacent Bechuana tribes makes them choose their abode far from the nearest spring or pool, and leads them not unfrequently to hide their supplies by filling the pits with sand and making a fire over the spot. When they wish to draw water for use, the women come with twenty or thirty of their water vessels in a bag or net on their backs. These water vessels consist of ostrich egg-shells, with a hole in the end of each, such as would admit one's finger. The women tie a bunch of grass to one end of a reed about two feet long, which they insert in a hole dug as deep as the arm will reach, and then ram down the wet sand firmly round it. Applying the mouth to the free end of the reed, they form a vacuum in the grass beneath, in which the water collects, and in a short time rises into the mouth. An egg-shell is placed on the ground alongside the reeds, some inches below the mouth of the sucker. A straw guides the water into the hole of the vessel as she draws mouth-

ful after mouthful from below; and thus the whole stock of water passes through her mouth as a pump, and when taken home is carefully buried to prevent its loss by evaporation. A short stay among the thirsty Bakalaharis might teach us better to appreciate the blessings of an abundant supply of water.

These poor people generally attach themselves to influential men in the different Bechuana tribes near to their desert home, in order to obtain supplies of spears, knives, tobacco, and dogs, in exchange for the skins of animals which they kill. These are small carnivora of the feline race, including two species of jackal, the dark and the golden, the former of which has the warmest fur the country yields, while the latter is very handsome when made into the skin-mantle called *kaross*. Next in value follow the small ocelot, the lynx, the wild and the spotted cat. Great numbers of duiker and steinbuck skins are also obtained, besides those of lions, panthers, and hyænas.

The Bakalahari are a timid race, and in bodily development frequently resemble the aborigines of Australia. They have thin legs and arms, and large protruding abdomens, caused by the coarse indigestible food they eat. Their children's eyes have no lustre, and such is their want of the animation so natural at that age that Dr. Livingstone never saw them at play.

A Bechuana may meet a troop of Bakalahari, and domineer over the whole with impunity; but when he meets a Bushman he is fain to adopt a more humble tone, well knowing that if the request for tobacco is refused, the free son of the desert may endeavour to obtain it by a poisoned arrow.



TOWER IN AGADES.

## CHAPTER X.

### THE SAHARA.

Its uncertain Limits—Caravan Routes—Ephemeral Streams—Oases—Inundations—Luxuriant Vegetation of the Oases contrasted with the surrounding Desert—Harsh contrasts of Light and Shade—Sublimity of the Desert—Feelings of the Traveller while crossing the Desert—Its charms and terrors—Sand-Spouts—The Simoom—The ‘Sea of the Devil’—The Gazelle—Its chase—The Porcupine—Fluctuation of Animal Life according to the Seasons—The Tibbos and the Tuaregs—Their contempt of the sedentary Berbers.

**F**ROM the Nile to the Senegal, and from the vicinity of Agades or of Timbuctoo to the southern slopes of the Atlas, extends the desert which above all others has been named the Great.

Surpassing the neighbouring Mediterranean at least three times in extent, and partly situated within the tropical zone, partly bordering on its confines, its limits are in many places as undetermined as the depths of its hidden solitudes. No European has ever travelled along its southern boundary, nor is its interior known, except only along a few roads, traced for many a century by the wandering caravans.

In general the desert may be said to extend in breadth from the thirty-ninth to the seventeenth degree of northern latitude; but while in many parts it passes these bounds, in others fruit-

ful districts penetrate far into its bosom, like large peninsulas or promontories jutting into the sea.

Until within the last few years, it was supposed to be a low plain, partly situated even below the level of the ocean; but the journeys of Barth, Overweg, and Vogel have proved it, on the contrary, to be a high table-land, rising 1,000 or 2,000 feet above the sea. Nor is it the uniform sand-plain which former descriptions led one to imagine; for it is frequently traversed by chains of hills, as desolate and wild as the expanse from which they emerge. But the plains also have a different character in various parts: sometimes over a vast extent of country the ground is strewed with blocks of stone or small boulders, no less fatiguing to the traveller than the loose drift sand, which, particularly in its western part (most likely in consequence of the prevailing east winds), covers the dreary waste of the Sahara. Often also the plain is rent by deep chasms, or hollowed into vast basins. In the former, particularly on the northern limits of the desert, the rain descending from the gulleys of the Atlas, sometimes forms streams, which are soon swallowed up by the thirsty sands, or dried by the burning sunbeams. In spite of this short duration, the sudden appearance of these streams is not unfrequently the cause of serious distress to the oases which border the northern limits of the desert.

For this reason, as soon as the Atlas veils itself with clouds, horsemen from the oases of the Beni-Mzab are sent at full speed into the mountains. They form a chain as they proceed, and announce, by the firing of their rifles, the approach of the waters. The inhabitants of the oases instantly hurry to their gardens to convey their agricultural implements to a place of safety. A rushing sound is heard; in a short time the ground is inundated; and the little village seems suddenly as if by magic transported to the banks of a lake, from which the green tufts of the palm-trees emerge like islands. But this singular spectacle soon passes away like the fantastic visions of the mirage.

The deeper basins of the Sahara are frequently of great extent, and sometimes contain large deposits of salt. Wherever perennial springs rise from the earth, or wherever it has been possible to collect water in artificial wells, green oases, often

many a day's journey apart from each other, break the monotony of the desert. They might be compared with the charming islands that stud the vast solitudes of the South Sea; but they do not appear, like them, as elevations over surrounding plains of sea, but as depressions, where animals and plants find a sufficient supply of water, and a protection, not less necessary, against the terrific blasts of the desert.

A wonderful luxuriance of vegetation characterises these oases of the wilderness. Under and between the date-palms, grow apricot and peach trees, pomegranates and oranges, the henna, so indispensable to Oriental beauty; and even the apple-tree, the pride of European orchards. The vine twines from one date-palm to another, and every spot susceptible of culture produces corn, particularly dourrah or barley, and also clover and tobacco. With a prudent economy the villages are built on the borders of the oases on the unfruitful soil, so that not a foot of ground susceptible of culture may be lost.

The vast tracts of sterile sand, where not even the smallest plant takes root, and which might be called the 'desert of the desert,' present the greatest conceivable contrast to its green oases. With the vegetable world the animal kingdom likewise disappears, and for days the traveller pursues his journey without meeting with a single quadruped, bird, or insect. All is solitude and death in this awful wilderness, where, in the Bedouins' poetical language, 'nothing exists but Allah!' Nowhere are the transitions of light and shade more abrupt than in the desert, for nowhere is the atmosphere more thoroughly free from all vapours. The sun pours a dazzling light on the ground, so that every object stands forth with wonderful clearness, while all that remains in the shade is sharply defined, and appears like a dark spot in the surrounding glare.

These harsh contrasts between light and shade deprive the landscape of all grace and harmony; but this want is amply compensated by its singular grandeur. The boundless horizon and the silence which reigns over the whole scene, appeal with powerful effect to the imagination, and thus constantly amuse the mind amid scenery that presents so few objects to occupy it. But in such a country every slight modification of form or colour rivets observation: the senses are sharpened, and perceptive faculties prone to grow dull over a perpetual shifting

of scenery, act vigorously when excited by the capability of embracing each detail. To the solitary wayfarer there is an interest in the wilderness unknown to the Alpine glacier and even to the rolling prairie, the effect of continued excitement on the mind, stimulating its powers to their pitch. Above, a sky, terrible in its stainless beauty, and the splendour of a pitiless blinding glare; around you, drifted sand-heaps upon which each puff of wind leaves its own trace in solid waves; naked rocks, the very skeletons of mountains, and hard unbroken plains, over which he who rides is spurred by the idea that the bursting of a water-bag or the pricking of a camel's hoof would be certain death of torture—a haggard land infested by wild beasts and wilder men—a region whose very fountains seem to murmur the warning words ‘Drink and away.’ What can apparently be more devoid of every charm, and yet in none of her aspects is Nature more fascinating and sublime. Man's heart bounds in his breast at the thought of measuring his puny force with the desert's might, and of emerging triumphant from the trial—and this sense of danger never absent invests the scene of travel with an interest not its own.

Thus, in spite of all he may have endured, the traveller that has once crossed the desert will ever after remember it with regret, and long for the renewal of its deep emotions. For the life of the Sahara resembles that of the ocean. During a continuance of bad weather or a calm the mariner may vow to forsake the sea for ever, but he has scarcely landed when his affection revives and he longs for the sea again.

In summer when the sun pours his vertical rays over the arid waste the desert is one vast furnace; but in the temperate season, its pleasures well repay the wanderer for many a peril or hardship. In this pure dry atmosphere his health improves, and with his health the tone and vigour of his mind. Though his mouth glows and his skin is parched—yet he feels no languor, the effect of humid heat; his lungs are lightened, his sight brightens, his memory recovers its strength, his spirits become exuberant, his fancy and imagination are powerfully aroused—and the wildness and sublimity of the scenes around him stir up all the energies of his soul—whether for exertion, danger, or strife. His senses are quickened; they require no stimulant but air and exercise—in the desert spirituous

liquors only excite disgust. There is a keen enjoyment in a mere animal existence. The vigorous appetite disposes of the most indigestible food; the sand is softer than a bed of down, and the purity of the air suddenly puts to flight a dire cohort of diseases. Hence it is that both sexes and every age, the most material as well as the most imaginative of minds, all feel their hearts dilate and their pulses beat strong, as they look down from their dromedaries upon the glorious desert.

Nothing can equal the beauty of the night in these arid wilds, doubly grateful after the heat and glare of the day. We, the sons of a colder clime, accustomed to see the starry firmament faintly glimmering through a misty haze, can have no idea of the magnificence of its luminous worlds brightly sparkling through an atmosphere of incomparable clearness. Gazing at these isles of light the soul rises on the wings of adoration to Him who made them. The desert is the image of the Infinite; no place is more apt to awaken religious feelings, and no time is fitter for devotion than its still and solitary night. He, who, in the desert does not hear the voice of God, knows not the Almighty, and ranks far below the wandering Arab, who, after the toil of the sultry day, reverentially bows down his forehead in prayer over the sand of the desert. Falling on his knees he exclaims: 'Allah hu akbar! God is greater:' greater than all created things, which only bear witness to His greatness.

But it is not alone the sublime grandeur of the desert which raises the spirit of man to his Maker; its terrors also make him vividly feel the Almighty presence, for when the sense of his helplessness becomes overpoweringly acute, he then instinctively looks for protection above.

As the conflicting air-currents of the ocean occasion water-spouts, the terror of the mariner; so also sandspouts or trombs arise in rotatory eddies from the midst of the desert, and assume the form of mighty columns, sometimes slowly moving along, at others advancing with menacing swiftness.

As they rapidly scud with the wings of the whirlwind over the plain—huge, yellow shafts with lofty heads horizontally bent backwards in the form of clouds, it requires but little stretch of fancy to enter into the Bedouin's superstition, and, like the imaginative sons of the desert, suppose them to be the

genii of the waste which cannot be caught, a notion arising from the fitful movements of the wind-eddy that raises them. As they advance, the pious Moslem stretches out his finger, exclaiming, 'Avaunt, O thou ill-omened one!'

Every moment the dread columns change their station, their appearance, their form. Onward they move, with terrible rapidity; the sun tints them with the brilliancy of fire; the storm, whirling in and around them, cuts them into several branches, reunites them, now weakens and now again strengthens them; and when, the whirlwind having spent its force, they suddenly collapse, and relieve the traveller from the fear of immediate danger, he yet must not exult too soon, for generally these sandspouts are followed by the dreaded simoom.

The temperature of the air becomes intolerably oppressive; it is sultry and enervating as before a thunder-storm. The hitherto crystal transparency of the sky is veiled with a hazy dimness, it is the sand of the desert whirling at a distance in the atmosphere, but as yet no wind is felt. The camels, however, are conscious of its approach. They become restless and anxious, and appear overcome by fatigue.

And now a light hot wind arises from the south, or southwest, blowing in intermittent gusts like the laborious breathing of a feverish patient.

Gradually the convulsions of the storm grow more violent and frequent; and although the sun is unable to pierce the thick dust-clouds, and the shadow of the traveller is scarcely visible on the ground, yet so suffocating is the heat that it seems to him as if the fiercest rays of the sun were scorching his brain.

The fiery purple of the atmosphere gradually changes to a leaden blackness; the wind becomes constant; the camels, snorting and groaning, stretch out their necks flat upon the ground, and turn their backs to the raging sand-storm. The Arabs pile up the water-bags, so as to screen them from the wind and diminish the surface exposed to the dry air, and wrapping themselves up as closely as possible in their cloaks, seek protection behind chests or bales of merchandise.

At night darkness is complete, no light or fire burns in the tents, which are hardly able to resist the gusts of the simoom. A deep silence reigns throughout the whole caravan, yet no one

sleeps ; the bark of the jackal or the howl of the hyæna alone sounds dismally from time to time through the loud roaring of the storm.

A prolonged simoom causes more fatigue to man and beast than all the other hardships of a desert journey, and brings new and as yet unknown sufferings to the traveller. Under the desiccating influence of the dry air, his lips spring open and begin to bleed, his parched tongue vainly longs for a refreshing draught ; and, together with a raging thirst, an insupportable itching and burning invade the whole body ; for the skin bursts in a hundred places, and the fine irritating dust penetrates into every wound.

Sometimes a raving madness, the symptoms of a fatal inflammation, is the result of these complicated tortures ; in other cases the blood circulating with feverish haste through the veins, produces congestion of the brain ; and, senseless and motionless, the wretch sinks down upon the ground, never to rise again. And the lot of him who still retains the full consciousness of his misery is not more enviable, for death by thirst awaits him, with slower but more dreadful pangs. His camel drops, his water-bag is nearly empty. He tries to walk ; in a short time the glowing sand produces gangrenous sores in his feet, and every step is accompanied by the most excruciating pain. His companions are all too busy with themselves to pay the least attention to the unfortunate sufferer ; they have but one thought—self ; one aim—that of reaching the next well. Abandoned to his fate, the deserted traveller stands alone, waterless, helpless in the dreadful waste. He tears his beard, he curses his destiny ; for him there is no hope.

And now, when earth and heaven begin to reel around him, the '*Sea of the Devil*' spreads out its delusive phantoms before his weakened vision. He sees all his heart can wish for ; palm groves waving over a broad expanse of lake ; winding rivers covered with barges, their streamers gaily floating in the breeze ; fairy gardens surrounded by rippling waters. The glorious prospect stimulates him to one last exertion ; could he but reach that blessed shore the joys of paradise were his, but his paralysed limbs mock the vain effort which exhausts the last remnant of his strength.

The crows, wheeling with dismal cries over the dying wretch,

often hack out his eyes before death relieves him of all pain. These corsairs of the air accompany the caravan as sharks accompany a vessel; for they reckon, like the tyrants of the seas, upon the tribute of the journey.

In a short time the dry atmosphere changes the corpse into a natural mummy, which, 'grinning horribly a ghastly smile,' seems to defy the desert. Perchance some future caravan passing along throws some pious dust upon the shrivelled body, but the wind soon uncovers it again, for the shifting desert will not even grant a burial to its victims. On every great caravan route such mummies protruding from the sand meet the eye of the traveller, telling him, in their mute but expressive language, 'Such, stranger, may be thy fate to-morrow.'

The arid desert produces only a few plants and animals, but stamps them all with its own peculiar mark. From the tawny Bedouin to the worm scarcely distinguishable in the sand, it gives all its creatures the same dress, the same colour, which might justly be called the colour of the desert. It is the pale greyish-yellow tint which belongs as well to the gazelle as to the small lark of the sandy wastes. Among the birds there are no doubt many modifications of this general rule, and the deviations increase as the desert gradually merges into the more fertile steppes, but even here its characteristic mark is not to be mistaken.

A wandering desultory life is the lot of the children of the desert. The nourishment afforded them by their sterile home is too scanty for sedentary habits, and cannot be obtained without exertion. But Nature has endowed them with an activity and powers of endurance which distinguish them from many other animals, and enable them to exist where less hardy or less spirited beings would perish. Even such of them as originally did not belong to the desert, but since several generations have learnt to make it their home, such as the noble horse of the Bedouin, acquire the spirit it engenders. The same love of independence, the same attachment to their native haunts, animates all the inhabitants of the desert. Separated from their home they droop and pine away. The richest food affords the captive gazelle no compensation for the meagre herbage of the sandy waste; the widest space seems narrow when compared with its boundless extent.

Nothing can be more elegant than the figure of this beautiful antelope in the full unfettered freedom of its native wilds. Its slender but vigorous limbs are in the highest degree elastic; all its actions are animated and graceful. When the approach of a caravan surprises it in its solitude, it pricks up its ears, stretches forth its neck, and fixes an attentive gaze upon the strangers. Distrusting their intentions, it vaults with a few bounds over large stones or bushes, and then again stops, playfully waving its horns to and fro. When once it has been chased it becomes extremely wary, and on account of its amazing fleetness can only be taken by dint of the utmost perseverance and cunning. It is often seen in large groups, bounding across the desert with such extraordinary swiftness that it seems bird-like to skim over the surface. From time immemorial its elegant form and brilliant eye have played a conspicuous part in Oriental poetry. The Arab loves to compare the eye of his mistress with that of the gazelle—

‘ Her eyes’ dark charm ’twere vain to tell,  
But look on that of the gazelle,  
It will assist thy fancy well’—

and ‘Thou art as graceful and as beautifully-shaped as a gazelle,’ is the highest compliment that can be paid to an Oriental beauty.

The chase of the gazelle is a favourite amusement of the inhabitants of the Saharian oases. On seeing a herd at a distance, they approach as cautiously as possible; and when about a mile distant, they unleash their greyhounds, who dart off with the rapidity of arrows, and are excited by loud cries to their utmost speed. Yet they only reach the flying herd after a long race; and now the scene acquires the interest of a drama. The best greyhound selects the finest gazelle for his prey, which uses all its cunning to avoid its pursuer, springing to the right, to the left, now forwards, then backwards, sometimes even right over the greyhound’s head; but all these zigzag evolutions fail to save it from its indefatigable enemy. When seized it utters a piteous cry, the signal of the greyhound’s triumph, who kills it with one bite in the neck.

When we consider the scanty vegetation of the Sahara, we cannot wonder that animal life is but sparingly scattered over its surface. The lion, so frequently misnamed ‘the king of the

desert,' only shows himself on its borders ; and on asking the nomads of the interior whether it is ever seen in their parts, they gravely answer that in Europe lions may perhaps feed on shrubs or drink the air, but that in Africa they cannot exist without flesh and water, and therefore avoid the sandy desert. In fact, they never leave the wooded mountains of the Atlas, or the fruitful plains of the Soudan, to wander far away into the Sahara, where snakes and scorpions are the only dangerous animals to be met with. The snakes, which belong to the genus *Cerastes*, which is distinguished by two small horns upon the head, have a deadly bite, and are remarkable for their almost total abstinence from water.

Among the animals which inhabit those parts of the desert which are covered with prickly shrubs, we find hares and rabbits, hyenas and jackals, the hedgehog and the porcupine. Well-beaten paths, and here and there a scattered quill, lead to the hole which this proverbially fretful animal burrows in the sand. The hunters widen the entrance with their poniards or swords, until a hoarse, prolonged growl, and the peculiar noise which the enraged porcupine makes on raising his quills, warn them to be on their guard. Suddenly the creature rushes from its burrow to cast itself into the thicket ; but the well-aimed blow of a poniard stretches it upon the sand. A fire being kindled, the animal is buried under the embers ; and the quills then easily separate from the roasted and excellently-flavoured meat.

Several lizards inhabit the desert ; among others, a large grey monitor, and a small white skink, with very short legs, called *Zelgague* by the Arabs. Its movements are so rapid that it seems to swim on the sand like a fish in the water, and when one fancies one has caught it, it suddenly dives under the surface. Its traces, however, betray its retreat, and it is easily extracted from its hole,—a trouble which, in spite of the meagre booty, is not considered too great when provisions are scarce.

According to the seasons animal life fluctuates in the Sahara from north to south. In winter and spring, when heavy rains, falling on its northern borders, provide wide districts, thoroughly parched by the summer heat, with the water and pasturage needed for the herds, the nomadic tribes wander farther into the desert with their camels, horses, sheep, and goats, and retreat again to the coast-lands as the sun gains

power. At this time of the year the wild animals—the lion, the gazelle, and the antelope—also wander farther to the south, which at that time provides them, each according to its taste, with the nourishment which the dry summer is unable to bestow; while the ostrich, who during the summer ranged farther to the north, then retreats to the south; for hot and sandy plains are the paradise in which this singular bird delights to roam.

In the southern part of the Sahara the tropical rains, whose limits extend to  $19^{\circ}$  N. lat., and in some parts still farther to the north, produce similar periodical fluctuations in the animal life of the desert. Under their influence the sandy plains are soon enlivened here and there with grasses, and the parched shrubs clothe themselves with verdure. In the dry season, on the contrary, the green carpet disappears, and the country then changes into a dry waste. Frequently, however, the tropical rains fail to appear on their northern boundaries, and disappoint the hopes of the thirsty desert.

Two nomadic nations, the Tuaregs and the Tibbos wander with their camels and sheep over the immense expanse of the Sahara in quest of scanty forage and thorny shrubbery. The abstinence and hardships they frequently endure, the freedom of a roving life, and their predatory habits, give them an evident superiority over the sedentary Berbers, who inhabit the oases, and repay the haughty demeanour of the nomads with hatred and contempt. Yet, in spite of these feelings of ill-will, the bonds of traffic and of a common interest connect the vagrant and the agricultural tribes. Condemned to perpetual migrations, the nomad is forced to confide all the property he is unable to carry about with him to the inhabitants of the oases; he may even possess a small piece of land, the cultivation of which he entrusts to the latter, who, on his part, as soon as he has saved something, buys a sheep or a goat which he gives in charge to the nomad.

An unmitigated hatred, on the contrary, exists between the various erratic tribes, as here no mediating self-interest softens the antipathies which are almost universally found to exist between neighbouring barbarians, and their robber expeditions not merely attack the richly-laden caravan, but also the oasis which may be connected by the bonds of intercourse with their hereditary enemies.



BEDOUIN WARRIORS.

## CHAPTER XI.

### THE BEDOUINS OF ARABIA.

The Deserts of Arabia—Sedentary Arabs and Bedouins—Physical Characteristics of the Bedouins—Remarkable acuteness of their Senses—Their Manners—Their intense Patriotism and Contempt of the dwellers in Cities—The Song of *May-sunah*—Their Wars—Their Character softened by the Influence of Woman—Their chivalrous Sentiments—The Arab horse—The Camel—Freedom of the Arabs from a Foreign and a Domestic Yoke—The Bedouin Robber—His Hospitality—Mode of Encamping—Death Feuds—Blood-money—Amusements—Throwing the *Jereed*—Dances—Poetry—Story-telling—Language—The Bedouin and the North American Indian.

**T**HOUGH Arabia possesses some districts of remarkable fertility which enjoy a succession of almost perpetual verdure, yet the greater part of that vast peninsula consists of burning deserts lying under a sky almost perpetually without clouds, and stretching into immense and boundless plains where the eye meets nothing but the uniform horizon of a wild and dreary waste. These naked deserts are encircled or sometimes intersected by barren mountains, which run in almost continuous ridges and in different directions from the borders of Palestine to the shores of the Indian Ocean. Their summits

tower up into rugged and insulated peaks, but their flinty bosoms supply no humidity to nourish the soil; they concentrate no clouds to screen the parched earth from the withering influence of a tropical sky. Instead of the cooling breezes periodically enjoyed in other sultry climates, hot winds frequently diffuse their noxious breath, alike fatal to animal and vegetable life. The steppes of Russia and the wilds of Tartary are decked by the hand of Nature with luxuriant herbage, but in the Arabian deserts vegetation is nearly extinct. The sandy plains give birth to a straggling and hardy brushwood, while the tamarisk and the acacia strike their roots into the clefts of the rocks, and draw a precarious nourishment from the nightly dews.

Were it not for the wadys, or verdant spots lying here and there among the hills, and the various wells or watering stations supplied by periodical rains, the greater portion of Arabia must have remained unpeopled, and for ever impervious to man. In a country like this, where whole years occasionally pass away without a refreshing shower, the possession of a spring is not unfrequently the most valuable property of a tribe. There are large tracts, however, where the luxury of water, as it may well be called, is unknown, and where the desert extends for many a day's journey without affording the traveller the welcome sight of a single well.

This extraordinary land is inhabited by a no less extraordinary people, divided into two great classes, widely different in their pursuits: the inhabitants of cities and towns, who live by tillage and commerce, and the natives of the desert, who follow a pastoral and predatory life, and consider the former as a separate and inferior race. Through all antiquity this characteristic distinction has remained inviolate, and as it is founded in the nature of the soil is even now as strongly marked as it was in the times of Abraham or Isaac.

In personal appearance, the wandering Arabs or Bedouins are of the middle size, lean and athletic. The legs though fleshless are well made, the arms thin, with muscles like whips. Deformity is checked among this nomadic race by the circumstance that no weakly infant can live through the hardships of a Bedouin life. The complexion varies from the deepest Spanish to a chocolate hue, and its varieties are

attributed by the people to blood. The black hair is either closely shaved, or hanging down in ragged elf-locks to the breast. Most popular writers describe the Arab eye as large, ardent, and black, but, according to Captain Burton, who, on his adventurous pilgrimage to Meccah, had full opportunity for observing many tribes, it is generally dark brown or green-brown, small, round, restless, deep-set, and fiery, denoting keen inspection, with an ardent temperament and an impassioned character. The habit of pursing up the skin below the orbits, and half-closing the lids to prevent dazzle, plants the outer angles with premature crow's-feet. Another peculiarity is the sudden way in which the eye opens, especially under excitement. This, combined with its fixity of glance, forms an expression now of lively fierceness, then of exceeding sternness. The look of a chief is dignified and grave even to pensiveness, yet there is not much difference in the expression of the eye between men of the same tribe, who have similar pursuits which engender similar passions. 'Expression,' as Captain Burton well remarks, 'is the grand diversifier of appearance among civilised people; in the desert it knows few varieties.' The bushy black eyebrows are crooked and bent in sign of thoughtfulness. The forehead is high, broad, and retreating. The temples are deep, the cheek-bones salient, which combined with the lantern-jaw often gives a death's-head appearance to the face. The nose is pronounced, generally aquiline, the ears small and well-cut, the mouth irregular, the teeth, as usual among Orientals, white, even, short, and broad. According to Chateaubriand, no sign would betray the savage in the Arab's countenance, if he constantly kept his mouth closed; it is when he shows his teeth, of a dazzling whiteness like those of the jackal, that his wild nature shows itself. In this he differs from the American Indian, whose ferocity appears in the eye, while the mouth has a mild expression. Some tribes trim their moustaches according to the practice derived from the Prophet; others shave them, or allow them to hang, Persian-like, over the lips. The beard is represented by two tangled tufts upon the chin, and where the whiskers should be, the place is either bare or thinly covered with straggling hair. The temperament of the Bedouins is either nervous or bilious, rarely sanguine, never

phlegmatic. They are not seldom subject to attacks of melancholy, which make them dislike the sound of the human voice and long for solitude.

From living constantly in the open air, the nomadic Arabs acquire a remarkable acuteness in all their senses. Their powers of vision and of hearing improve by continual exercise, and as their piercing eye sweeps over the desert it distinguishes objects at an incredible distance. Their sense of smelling, too, is extremely nice. The true Bedouin, when in the tainted atmosphere of towns, is always known by bits of cotton in his nostrils, or his kerchief tightly drawn over his nose, a heavy frown marking extreme disgust. Declining the shelter of a house when business calls him to visit crowded cities, he passes the night in a garden or public square, rather than breathe the confined air of an apartment. One of his most singular faculties is the power of distinguishing the footsteps of men and beasts on the sand, in the same manner as the American Indians discover impressions made upon the grass. From inspecting the footsteps, an Arab can tell whether the individual belonged to his own or some neighbouring tribe, and is thus able to judge whether he be a stranger or a friend. He likewise knows from the faintness or depth of the impression whether the person carried a load or not, whether he passed the same day or several days before. From examining the intervals between the steps, he judges whether or not he was fatigued, as the pace becomes then more irregular and the intervals unequal, hence he calculates the chances of overtaking him. Every Arab can distinguish the footmarks of his own camels from those of his neighbours; he knows whether the animal was pasturing or loaded, or mounted by one or more persons; and can often discover from marks in the sand certain defects or peculiarities of formation that serve him as a clue to ascertain the owner. This sagacity, which enables the Arab to read in the sands of the desert as in a printed volume, becomes extremely useful in the pursuit of fugitives, or in searching after stolen cattle. Instances occur of camels being traced by their masters to the residence of the thief at the distance of five or six days' journey; and, incredible as it may seem, a Bedouin shepherd can track his own camel in a sandy valley, when

thousands of other footsteps cross the road in all directions. Thus the proverbially unstable and fugitive sands reveal many a secret to the practised glance of the Arab ; and every footstep becomes a witness recording the offender's guilt.

Of their wonderful acuteness in hearing, some well-attested anecdotes are told of those who act as pilots in the Red Sea. They know very nearly the time when ships from India may be expected, and going down to the water's edge every night and morning, they lay their ear close to the surface for three or four minutes, and if the ship is not more than 120 miles distant, they can hear the report of the signal gun, or feel the ground shake, upon which they immediately set off in their pilot boat.

The manners of the Bedouins are free and simple ; vulgarity and affectation, awkwardness and embarrassment, are weeds of civilised growth, unknown to the people of the desert. Yet their manners are sometimes dashed with a strange ceremoniousness. When two friends meet, they either embrace or both extend the right hands, clapping palm to palm ; their foreheads are either pressed together, or their heads are moved from side to side, whilst for minutes together mutual inquiries are made and answered. It is a breach of decorum, even when eating, to turn the back upon a person ; and when a Bedouin does it, he intends an insult. When a friend approaches an encampment, those who catch sight of him shout out his name, and gallop up, saluting with their lances or firing matchlocks in the air.

The patriotism of the nomadic Arab is intense. As the Scottish Highlander wherever he roams turns with fond regret to his heath-clad hills, or the exiled Swiss pines for his snow-peaked Alps, thus his sterile sands are dearer to the wandering son of the desert than the fairest regions of the earth. It is in the lonely wilderness that all his attachments centre, for there alone he can enjoy the independence which in all ages has been his cherished possession. The very wildness of this inhospitable scenery constitutes in his eyes its principal charm, and were these features destroyed, the spell would be broken that associates them in his mind with the romantic freedom of his condition. Disdaining the peaceful and mechanical arts, he looks down with contempt upon all those who

are fixed in local habitations, or engaged in the pursuits of industry, and proud of being a 'dweller in tents,' which he can pitch and transplant at pleasure, stigmatises them as 'dwellers in houses made of clay.' His tent he regards as the nursery of every noble quality, and the desert as the only residence worthy of a man who aspires to be the unfettered master of his actions. Vain of his birth and freedom, he divides the world into two great bodies; first, the Arabs, and secondly, 'Ajemi,' all that are not Arabs; and boasts of the four precious gifts that Allah has bestowed on his nation: 'turbans instead of diadems, tents in place of walls and bulwarks, swords instead of intrenchments, and poems instead of written laws.'

The deep attachment of the Arab to his native wilds is well expressed in the celebrated song of Maysunah, the beautiful wife of the Caliph Muawijah. The pomp and splendour of an Imperial court could neither reconcile her to the luxuries of the harem nor make her forget the homely charms of her fatherland. Her solitary hours were consumed in melancholy musings, and her greatest delight was in singing the simple pleasures she had enjoyed in the desert. The following translation gives of course but a faint idea of the beauties of the original song, the recital of which fills the Bedouin with delight:

'Oh take these purple robes away,  
Give back my cloak of camel's hair,  
And bear me from this towering pile  
To where the Black Tents flap 't the air.  
The camel's colt with faltering tread,  
The dog that bays at all but me,  
Delight me more than ambling mules,  
Than every art of minstrelsy.'

Tradition reports that Muawijah overhearing the song, and perhaps tired of the singer, sent her back to her beloved wilds; but we are not told whether in the desert she did not after all sometimes regret the magnificence of Damascus.

Among the best traits of the Bedouins' character, we must cite their gentleness and generosity. Usually they are a mixture of worldly cunning and great simplicity; fond of a jest, yet solemn and dignified; easily managed by a laugh and a soft word, and pliable after passion, though madly revengeful after injury. Though reckless when their passions are thoroughly

roused, their valour is tempered by cautiousness. Their wars are a succession of skirmishes, in which 500 men will retreat after losing a dozen of their number. In this partisan fighting the first charge secures a victory, and the vanquished fly till covered by the shades of night. Then passion or shame prompts them to reprisals, which will probably end in the flight of the former victor. Gain and revenge draw the Arab's sword; yet, unlike the Irishman who fights for the mere fun of fighting, he must have the all-powerful stimulants of honour and fanaticism to become desperate. The habit of danger in raids and blood feuds, the continual uncertainty of existence, the desert, the chase, his hard life, and the practice of martial exercises, habituate him to look death in the face like a man, and powerful motives will make him a hero.

The ferocity of Bedouin life is softened by his intercourse with the 'dwellers in houses made of clay,' who frequently visit and entrust their children to the people of the Black Tents, that they may be hardened by the discipline of the desert. This laudable custom is generally followed by the Sherifs or the descendants of the Prophet residing in Meccah, and even the late Pacha of Egypt gave one of his sons in charge of the Anijah tribe near Akhba, that he might receive a Bedouin education and grow up into a man.

The mild influence of the fair sex likewise tends to soften the nomadic Arab's character, and to inspire him with chivalrous feelings. In pastoral life tribes often meet for a time, live together whilst pasturage lasts, and then separate perhaps for a generation. Under such circumstances youths will become attached to maidens whom possibly by the laws of the clan they may not marry, and then the lovers have recourse to flight. The fugitives must brave every danger; for revenge, at all times the Bedouin's idol, now becomes the lode-star of his existence. But the Arab lover will dare all consequences, and stake his life on the possession of her he loves.

Women, indeed, are regarded as inferior beings by their lords and masters, and to them exclusively all the labour and menial offices in the tent are assigned; but in troublous times and in the hour of need, they raise themselves to the level of the stronger sex by physical as well as moral courage. In the early days of Islam, if history be credible, Arabia had

many heroines, and within the last century Ghalujah, the wife of a Wahabi chief, opposed Mohammed Ali himself in many a bloody field. After a lost battle a retreating tribe has not unfrequently been again led on to victory by the taunts of its women, and Arab poets praise not only female beauty, but also female faith, purity, and affection.

From ancient periods of the Arab's history, we find him practising knight-errantry, the wildest but most exalted form of chivalry. The fourth Caliph is fabled to have travelled far, redressing the injured, punishing the injurer, preaching to the infidel, and especially protecting women—the chief end and aim of knighthood. The Caliph El Mutasen heard, in the assembly of his courtiers, that a woman of the Sayyid family had been taken prisoner by a 'Greek barbarian' of Ammoriam. The man on one occasion struck her, when she cried, 'Help me, O Mutasen!' and the fellow said derisively, 'Wait till he cometh upon his pied steed.' The chivalrous prince arose, sealed up the wine cup which he held in his hand, took oath to do his knightly duty, and on the morrow started for Ammoriam with 70,000 men, each mounted on a piebald charger. Having taken the place he entered it, exclaiming, 'Here am I at thy call!' He struck off the caitiff's head, released the lady with his own hands, ordered the cup-bearer to bring the sealed bowl, and drank from it, exclaiming, 'Now, indeed, wine is good!' A Knight of the Round Table could have done no better.

It is the existence of this noble spirit which makes the society of Bedouins so delightful to the traveller, who, after enjoying it, laments at finding himself in the 'loathsome company' of Persians, or among Arab townpeople, whose 'filthy and cowardly minds he contrasts with the 'high and chivalrous spirit of the true Sons of the Desert.'

While over the vast continent of America no effort has ever been made by the aboriginal tribes to establish a dominion over the useful animals, with the single exception of the Llama in the Peruvian highlands, we find the Arab shepherd from time immemorial in the absolute possession of the horse and the camel—of a faithful friend, and a laborious slave. Although the high steppes of Central Asia are probably the genuine and original country of the horse, yet in Arabia that generous animal attains the highest degree of spirit and swiftness.

Such is the estimation in which it is held, that the honours and the memory of the purest race are preserved with superstitious care, the males are sold at a high price, but the females are seldom alienated, and the birth of a noble foal is esteemed among the tribes as a subject of joy and mutual congratulation. A colt at the moment of birth is never allowed to drop upon the ground; they receive it in their arms, washing and stretching its tender limbs, and caressing it as they would a baby. The tender familiarity with which the horses are treated, trains them in the habits of gentleness and attachment. When not employed in war or travelling they loiter about the tents, often going over heaps of children lying on the ground, and carefully picking their steps lest they should hurt them. They are accustomed only to walk and to gallop; their sensations are not blunted by the incessant abuse of the spur and the whip; their powers are reserved for the movement of flight and pursuit, but no sooner do they feel the touch of the hand and the stirrup, than they dart away with the swiftness of the wind, and if their friend be dismounted in the rapid career they instantly stop till he has recovered his seat.

The noble steed of the desert pines and languishes in the crowded town. Its head droops mournfully, it seems the very image of despondency and sloth. And as the animal, so its master. He also appears, not as the bold energetic nomad, but as a listless apathetic wanderer; and, were it not for the glowing eye which restlessly rolls and flashes under its thick brow, you might be inclined to prefer the servile fellah to the sullen child of the desert. But now the Bedouin mounts his horse, and, as if touched by an electric spark, they both of them raise their heads and stretch their sinewy limbs. Slowly they leave the dusty streets, and reach the confines of the desert. Now at length both are at home; now rider and horse melt into one like the fabled Centaurs of old; now, first, the real Bedouin and the real Arabian horse stand before you. Like an arrow 'shot by an archer strong' the steed flies towards his master's tent, his light hoof scarcely leaves a print on the sand; the white burnous of the rider flies about in the wind; with a firm hand he guides the noble animal, and in a few minutes both are lost to sight in the desert.

Though the Arabs justly boast of their horses, it is a common

error to suppose them very abundant in that country. In the sacred writings and down to the time of Mohammed, they are seldom mentioned, camels being mostly used both in their predatory and warlike excursions. The breed is limited to the fertile pasture grounds, and it is there that they thrive, while the Bedouins who occupy arid districts rarely have any.

In the sands of Arabia the camel is a sacred and precious gift. That strong and patient beast of burthen not only supplies the wandering Arab with the greater part of his simple wants: it serves also to secure his immemorial independence by placing the desert between the enemy and himself. Thus the Bedouin has ever been indomitable, and while in other parts of the world we find that the fatal possession of an animal—the sable, the sea-otter—has entailed the curse of slavery upon whole nations, the dromedary in Arabia appears as the instrument of lasting freedom. With temporary or local exceptions, the body of the nation has escaped the yoke of the most powerful monarchies; the arms of Sesostris and Cyrus, of Pompey and Trajan, could never achieve the conquest of Arabia, and while the false glory of the scourges of mankind that have so often thrown the East into bondage has passed away like a fleeting shadow, one century after another bears testimony to the noble independence of the Arab. The manly spirit of this energetic race renders them worthy of the freedom they enjoy under the protection of their arid wastes. Many ages before Mohammed, who, stimulating their valour by fanaticism, made them one of the great conquering nations of the earth, their intrepidity had been severely felt by their neighbours. ‘The patient and active virtues of a soldier,’ says Gibbon, ‘are insensibly nursed in the habits and discipline of pastoral life. The care of the sheep and camels is abandoned to the women of the tribe, but the martial youth, under the banner of the emir, is ever on horseback and in the field, to practise the exercise of the bow, the javelin, and the scymetar. The long memory of their independence is the firmest pledge of its perpetuity, and succeeding generations are animated to prove their descent and to maintain their inheritance. When they advance to battle, the hope of victory is in the front; in the rear, the assurance of a retreat. Their horses and camels, who in eight or ten days can perform

a march of 500 miles, disappear before the conqueror; the secret waters of the desert elude his search, and his victorious troops are consumed with thirst, hunger, and fatigue, in the pursuit of an invisible foe, who scorns his efforts, and safely reposes in the heart of the burning solitude.

‘The slaves of a despotic rule may vainly boast of their national independence; but the Arab is as free from a domestic as from a foreign yoke. In every tribe superstition or gratitude or traditional respect has exalted a particular family above the heads of their equals. The dignities of sheik and emir invariably descend in this chosen race; but the order of succession is loose and precarious, and the most worthy or aged of the noble kinsmen are preferred to the simple though important office of composing disputes by their advice and guiding valour by their example. If an emir abuses his power he is quickly punished by the desertion of his subjects. Their independent spirit disdains a base submission to the will of a master, their steps are unconfined, the desert is open and the tribes and families are held together by a mutual and voluntary compact. Accustomed to a life of danger and distress, the breast of the wandering Arab is fortified with the austere virtues of courage, patience, and sobriety; the love of liberty prompts him to exercise the habits of self-command, and the fear of dishonour guards him from the meaner apprehension of pain, of danger, and of death. The self-respect which independence inspires shows itself in the dignity of his outward demeanour: his speech is slow, weighty, and concise; he is seldom provoked to laughter; his only gesture is that of stroking his beard, the venerable symbol of manhood.’

Unfortunately the Bedouin too often tarnishes his liberty by crime, and, accustomed to confound the ideas of stranger and enemy, endeavours to justify by casuistry the base pursuits of a robber. He pretends that in the division of the earth the rich and fertile climates were assigned to the other branches of the human family, and that the posterity of the outlaw Ismael is entitled to recover by fraud or force the portion of inheritance of which he has been unjustly deprived. Equally addicted to theft and merchandise, he ransoms or pillages the caravans that traverse his native desert, and armed against mankind, makes the inoffensive traveller the victim of his rapacious

spirit. And yet by one of those strange contradictions, belonging to the mysterious nature of man, this same Arab, the terror of the desert, embraces without enquiry or hesitation, the stranger who dares to confide in his honour and enter his tent. His treatment is kind and respectful, he shares the wealth or the poverty of his host, and, after a needful repose, he is dismissed on his way with thanks, with blessings, and perhaps with gifts.

Now here, now there, the Bedouin's home is as wide as the desert, and as movable as its drifting sands. The mode of encamping differs according to circumstances. When the tents are but few, they are pitched in a circle; if the number is considerable they extend in a straight line, in rows three or four deep. The sheik's is always on the side where danger is apprehended, or where travellers are expected;—it being his particular business to oppose the former and to honour the latter. Every chief sticks his lance into the ground in front of his tent, to which he ties his horse or camel; the pack-saddles forming the couch on which he and his guests recline. When wandering in search of water or pasture, they move in parties, slowly over the sandy plain. The armed horsemen ride foremost, the flocks with their young follow, and behind come the beasts of burden, loaded with the women and children, tents, baggage and provisions.

Among pastoral tribes the possession of a well, of a few date-palms, or of a piece of pasture ground, easily leads to quarrels, and, as rude nations generally prefer settling their disputes by the right of the stronger, to sanguinary feuds and wars. Besides the causes of hostility arising from disputed property, the natural jealousy and fiery temperament of the Arab have always proved a source of the most implacable enmity among themselves. They betray the quickest sensibility to any affront or injury, and instances might be multiplied where a contemptuous word, an indecent action, or even the most trifling violation of etiquette can only be expiated by the blood of the offender. If one sheik say to another, 'Thy bonnet is dirty,' or 'The wrong side of thy turban is out,' it is considered a mortal offence. To spit on the beard of another, even accidentally, is an insult scarcely to be forgiven, and such is their patient inveteracy that they expect whole months and years the opportunity

of revenge. A fine or compensation for murder is familiar to the barbarians of every age, but in Arabia the kinsmen of the dead are at liberty to accept the atonement, or to exercise with their own hands the law of retaliation. If the offer is deemed unsatisfactory, the homicide and all his kin comprised within the law of vengeance, make their escape to some friendly tribe. A sacred custom allows the fugitives three days and four hours during which their enemies abstain from the pursuit; the exiles are permitted to return as soon as a reconciliation can be effected. The fine for a murdered man varies among the different tribes. Among the Beni-Harb in Hedjaz the price of blood is rated at 800 dollars, or rather that sum imperfectly expressed by live stock. All the blood relations of the slayer assist to make up the required amount, rating each animal at three or four times its proper value. On such occasions violent scenes arise from the conflict of the Arab's two darling passions, avarice and revenge. He longs to cut the foe's throat, but on the other hand he is equally desirous to increase his own possessions. He has always a project of buying a new dromedary, or of investing capital in some promising colt. The consequence is that he is insatiable. Still he receives blood money with a feeling of shame, as a man who has made some sacrifice of duty or fine feeling for the sake of filthy lucre. Hence this mode of arrangement is not common among the more wealthy tribes, and most of the great sheiks would deem themselves dishonoured by compromising in any degree for the slaughter of their relations. The matter being finally settled, a she camel is brought to the tent of the adversary and there killed that blood may be expiated by blood. The parties now reconciled feed upon the flesh of the animal, and at parting the homicide flourishes a white handkerchief on his lance as a public notification that he is free from blood.

The simple unvaried life of the Bedouin must often cause time to hang heavy on his hands. To relieve this weariness and want of novelty he has recourse to various amusements which serve to fill up his vacant hours. A rover or a warrior, his favourite sports are those that imitate war. Throwing the jereed is a kind of rude tournament, which he frequently practises. This is a blunt spear, made of heavy wood, and about a yard long. The object of the game, in which the

players evince the most astonishing dexterity, is for one party to pursue, and the other to fly, and try to elude being struck by the weapon. Sometimes they amuse themselves with sham fights; and nothing can be more picturesque, than to see a group of these wild men huddled together in the greatest apparent confusion, with drawn swords and couched lances.

The more domestic pastimes are chess, draughts, dancing, singing, the reciting of poetry and story-telling, for which they have a singular passion. Captain Burton, who witnessed one of their war dances, describes it as wild in the extreme, resembling rather the hopping of bears than the inspirations of Terpsichore. The dancers raised both arms high above their heads, brandishing a dagger or some other small weapon. They followed each other by hops on one or both feet; sometimes indulging in the most demented leaps, whilst the by-standers accompanied them with clapping of hands and various motions of the body. There is a species of song, common all over the desert, in which the youths of both sexes join in the chorus. It is called the *mesamer*, and is the only opportunity which the lover has of serenading his mistress; the verses are often composed extempore, and relate, of course, to the beauty and qualities of the beloved object, who is sometimes apostrophized in epithets that sound rather oddly to European ears: 'O Ghalia! if my father were a jackass, I would sell him to purchase Ghalia.'

During their long marches through the desert, the Bedouins likewise have recourse to singing, both to enliven their camels, for it is well known that that animal never moves with so much ease as when he hears his master sing, and to while away the tediousness of the road. Monotonous and droning as it is, their song has yet an artless plaintiveness which admirably suits the singer and the scenery. If you listen to the words you will surely hear allusions to bright verdure, cool shades, bubbling rills, or something which the son of the desert hath not, and yet which his soul desires. A common entertainment among the Bedouins, is the reciting of tales after the manner of the 'Arabian Nights,' those enchanting fictions which rival even 'Robinson Crusoe' in the affections of childhood. Assembled after a tedious march round the blazing fire which cooks their simple meal of dhourra or sour camel's milk and flour, and quaffing the soothing fumes of tobacco, they learn to forget

their own hardships and fatigue in the captivating narrative of ideal adventures, and become for a time the happiest of men.

Next to the practice of hospitality and expertness in the use of arms, the Arabs value no accomplishments more highly than eloquence and poetry, and in these the roving hordes of the desert, living amidst the solitary grandeur of nature, excel their more civilized brethren. Metrical orations are particularly esteemed, for it is an old Arab saying that fine sentiments delivered in prose are like gems scattered at random ; but when confined in verse they resemble strings of pearls.

In former times the poet ranked with the warrior among the noblest possessions a tribe could boast of, and assemblies of different kinds were held where rival bards and orators disputed the palm of victory. In loud and impassioned strains the contending poets addressed the multitude by turns, extolling the superior glory of their own tribe, recounting the names of their eminent warriors, and challenging their opponents to produce their equals. As from the fierce spirit of the Bedouins, and the well-known influence of songs over the martial virtues of a barbarous people, these intellectual tournaments frequently ended in good earnest battles, they were expressly abolished by the Koran ; but the old spirit of poetry is still as alive as ever among the Bedouins, who, though no longer equalling them, are passionately fond of their ancient bards. Thus when Burckhardt read portions of the famous romance of Antar to a Bedouin auditory they were in ecstasies of delight, but at the same time so enraged at his bad pronunciation, that they tore the book out of his hands.

To the advantages of a genius for poetry, and a lively fancy, the Bedouins add the possession of a rich and harmonious language capable of expressing every shade of meaning and every variety in the aspects of nature. Its copiousness \* may be inferred from the fact that it can boast of no less than eighty expressions for honey, two hundred for a serpent, five hundred for a lion, and, characteristic of a warlike race, above a thousand for a sword. Fastidious critics have admitted the remarkable delicacy of the Arabic tongue, and its energetic sublimity,

\* Whoever has read Rückert's wonderful translation of 'The Makamas of Hariri' will be able to form some opinion of the richness of the Arabic and at the same time admire the exuberant treasures of the German tongue.

equally adapted to the simple pathos of love and elegy, the piquancy of satire or the loftiest efforts of popular oratory.

In casting a retrospective view over the manners and habits of the Bedouins we are struck with the strange contradictions they exhibit both in their social and moral character. The spirit of patriotism among them is strong and universal, yet they have no home but the pathless waste and wretched tent. They are a nation of brothers, yet live continually at war, jealous of their honour and yet stooping to the meanness of theft; fierce and sanguinary in their temper, and yet alive to the virtues of pity and gratitude; covetous and by no means of good faith in pecuniary transactions, yet true to their pledged word and charitable to the needy.

Their religious character is marked by the same irreconcilable extremes. Their fanaticism is coupled with a lax observance of the precepts and ceremonies of Islam. In a pleasant indifference about the precepts of the Koran, they remark that the religion of Mohammed never could have been intended for them. 'In the desert,' say they, 'we have no water; how, then, can we make the prescribed ablutions? We have no money, and how can we bestow alms? Why should we fast in the Rhamadan since the whole year with us is one continual abstinence; and if the world is the house of Allah why should we go to Meccah to adore him?'

The almost absolute independence of the Arabs and of that noble race, the North American Indians of a former generation, has produced many similarities between them. 'Both,' says Captain Burton, 'have the same wild chivalry, the same fiery sense of honour, and the same boundless hospitality; love elopements from tribe to tribe, the blood feud and the vendetta. Both are grave and cautious in demeanour, and formal in manner—princes in rags or paint. The Arabs plunder pilgrims, the Indians backwood settlers; both glory in forays, raids, and cattle-lifting, and both rob according to certain rules. Both are alternately brave to desperation and shy of danger. Both are remarkable for nervous and powerful oratory, and for the use of figurative language. Both, addicted to war and to the chase, despise all sedentary occupations. But the Bedouin claims the superiority over the red Indian by his treatment of women, his greater development of intellect, and the grand page of history which he has filled.'



BAOBAB TREES AT MANAAR.

## CHAPTER XII.

### GIANT TREES AND CHARACTERISTIC FORMS OF TROPICAL VEGETATION.

General Remarks—The Baobab—Used as a Vegetable Cistern—Arborescent Euphorbias—The *Dracæna* of Orotava—The Sycamore—The Banyan—The sacred Bo-Tree of Anarajapoorá—The Teak Tree—The Saul—The Sandal Tree—The Satinwood Tree—The *Ceiba*—The Mahogany Tree—The Mora—Bamboos—The *Guadua*—Beauty and multifarious Uses of these colossal Grasses—Firing the Jungle—The Aloes—The *Agave americana*—The Bromelias—The Cactuses—The Mimosas—Bush-ropes—Climbing Trees—Emblems of Ingratitude—Marriage of the Fig Tree and the Palm—Epiphytes—Water Plants—Singularly-shaped Trees—The *Barrigudo*—The Bottle Tree—Trees with Buttresses and fantastical Roots—The Mangroves—Their Importance in Furthering the Growth of Land-Animal Life among the Mangroves—‘Jumping Johnny’—Insalubrity of the Mangrove Swamps—The Lum Trees with formidable Spines.

WHEREVER in the tropical regions periodical rains saturate the earth, vegetable life expands in a wonderful variety of forms. In the higher latitudes of the frozen north, a rapidly evanescent summer produces but few and rare flowers in sheltered situations, soon again to disappear under the winter’s snow; in the temperate zones, the number, beauty, and variety of plants increases with the warmth of a genial sky; but it is only where the vertical rays of an equatorial sun awaken and foster life on humid grounds that ever-youthful Flora appears in the full exuberance of her creative power. It is only there we find the majestic palms, the elegant

mimosas, the large-leaved bananas, and so many other beautiful forms of vegetation alien to our cold and variable clime. While our trees are but sparingly clad with scanty lichens and mosses, they are there covered with stately bromelias and wondrous orchids. Sweet-smelling vanillas and passifloras wind round the giants of the forest, and large flowers break forth from their rough bark, or even from their very roots.

The number of known plants is estimated at about 200,000, and the greater part of this vast multitude of species belongs to the torrid zone. But if we consider how very imperfectly these sunny regions have as yet been explored—that in South America enormous forest lands and river basins have never yet been visited by a naturalist—that the vegetation of the greater part of Central Africa is still completely hidden in mystery—that no botanist has ever yet penetrated into the interior of Madagascar, Borneo, New Guinea, South-Western China, and Ultra-Gangetic India—and that, moreover, many of the countries visited by travellers have been but very superficially examined—we may well doubt whether even one fourth part of the tropical plants is actually known to science.

After these general remarks on the variety and exuberance of tropical vegetation, I shall now briefly notice those plants which, by their enormous size, their singularity of form, or their frequency in the landscape, chiefly characterise the various regions of the torrid zone.

The African Baobab, or monkey-bread tree (*Adansonia digitata*), may justly be called the elephant of the vegetable world. Near the village Gumer, in Fassokl, Russegger saw a baobab thirty feet in diameter and ninety-five in circumference; the horizontally outstretched branches were so large that the negroes could comfortably sleep upon them. The Venetian traveller Cadamosto (1454) found, near the mouths of the Senegal, baobabs measuring more than a hundred feet in circumference. As these vegetable giants are generally hollow, like our ancient willows, they are frequently made use of as dwellings or stables; and Dr. Livingstone mentions one in which twenty or thirty men could lie down and sleep, as in a hut. In the village of Grand Galarques, in Senegambia, the negroes have decorated the entrance into the cavity of a monstrous baobab with rude sculptures cut into the living

wood, and make use of the interior as a kind of assembly room, where they meet to deliberate on the interests of their small community, 'reminding one,' says Humboldt, 'of the celebrated plantain in Lycia, in whose hollow trunk the Roman consul, Lucinius Mutianus, once dined with a party of twenty-one.' As the baobab begins to decay in the part where the trunk divides into the larger branches, and the process of destruction thence continues downwards, the hollow space fills, during the rainy season, with water, which keeps a long time, from its being protected against the rays of the sun. The baobab thus forms a *vegetable cistern*, whose water the neighbouring villagers sell to travellers. In Kordofan the Arabs climb upon the tree, fill the water in leathern buckets, and let it down from above; but the people in Congo more ingeniously bore a hole in the trunk, which they stop, after having tapped as much as they require.\*

The height of the baobab does not correspond to its amazing bulk, as it seldom exceeds sixty feet. As it is of very rapid growth, it acquires a diameter of three or four feet and its full altitude in about thirty years, and then continues to grow in circumference. The larger beam-like branches, almost as thick at their extremity as at their origin, are abruptly rounded, and then send forth smaller branches, with large, light green, palmated leaves. The bark is smooth and greyish. The oval fruits, which are of the size of large cucumbers, and brownish-yellow when ripe, hang from long twisted spongy stalks, and contain a white farinaceous substance, of an agreeable acidulated taste, enveloping the dark brown seeds. They are a favourite food of the monkeys, whence the tree has derived one of its names.

From the depth of the incrustations formed on the marks which the Portuguese navigators of the fifteenth century used to cut in the large baobabs which they found growing on the African coast, and by comparing the relative dimensions of several trunks of a known age, Adanson concluded that a baobab of thirty feet in diameter must have lived at least 5,000 years; but a more careful investigation of the rapid growth of the spongy wood has reduced the age of the giant tree to more moderate limits, and proved that, even in

\* D'Escayrac, 'Le Désert et le Soudan.'

comparative youth, it attains the hoary aspect of extreme senility.

The baobab, which belongs to the same family as the mallow or the hollyhock, and is, like them, emollient and mucilaginous in all its parts, ranges over a wide extent of Africa, particularly in the parts where the summer rains fall in abundance, as in Senegambia, in Soudan, and in Nubia. Dr. Livingstone admired its colossal proportions on the banks of the Zouga and the Zambesi. It forms a conspicuous feature in the landscape at Manaar in Ceylon, where it has most likely been introduced by early mariners, perhaps even by the Phœnicians, as the prodigious dimensions of the trees are altogether inconsistent with the popular conjecture of a Portuguese origin.

Another tree very characteristic of Africa, and frequently seen along with the baobab, is the large arborescent Euphorbia (*E. arborescens*), surmounted at the top with stiff leaves, branching out like the arms of a huge candelabra. It adds greatly to the strange wildness of the landscape, and seems quite in character with the aspect of the unwieldy rhinoceros and the long-necked giraffe.

Dracænas, or dragon-trees, are found growing on the west coast of Africa and in the Cape Colony, in Bourbon and in China; but it is only in the Canary Islands, in Madeira, and Porto Santo, that they attain such gigantic dimensions as to entitle them to rank among the vegetable wonders of the world.

Unfortunately, the venerable dragon-tree of Orotava, in Teneriffe, which was already revered for its age by the extirpated nation of the Guanches, and which the adventurous Bethencourts, the conquerors of the Canaries, found

hardly less colossal and cavernous in 1402 than Humboldt, who visited it in 1799, was destroyed by a storm in 1871. Above the roots the illustrious traveller measured a circum-



DRAGON-TREE OF OROTAVA.

ference of forty-five feet ; and according to Sir George Staunton, the trunk had still a diameter of four yards, at an elevation of ten feet above the ground. The whole height of the tree was not much above sixty-five feet. The trunk divided in numerous upright branches, terminating in tufts of evergreen leaves, resembling those of the pine-apple.

Next to the baobab and the dracæna, the Sycamore (*Ficus Sycamorua*) holds a conspicuous rank among the giant trees of Africa. It attains a height of only forty or fifty feet, but in



SYCAMORE.

the course of many centuries its trunk swells to a colossal size, and its vast crown covers a large space of ground with an impenetrable shade. Its leaves are about four inches long and as many broad, and its figs have an excellent flavour. In Egypt it is almost the only grove-forming tree ; and most of the mummy coffins are made of its incorruptible wood.

No baobab rears its monstrous trunk on the banks of the Ganges ; no dragon-tree of patriarchal age here reminds the wanderer of centuries long past ; but the beautiful and stately Banyan (*Ficus indica*) gives him but little reason to regret their absence. Each tree is in itself a grove, and some of them are of an astonishing size, as they are continually increasing, and,

contrary to most other animal and vegetable productions, seem to be exempted from decay ; for every branch from the main body throws out its own roots, at first in small tender fibres, several yards from the ground, which continually grow thicker, until, by a gradual descent, they reach its surface, where, strik-



BANYAN.

ing in, they increase to a large trunk and become a parent-tree, throwing out new branches from the top. These in time suspend their roots, and, receiving nourishment from the earth, swell into trunks and send forth other branches, thus continuing in a state of progression so long as the first parent of them all supplies her sustenance.

The bended twigs take root, and daughters grow  
About the mother-tree ; a pillar'd shade  
High overarch'd, and echoing walks between.  
There oft the Indian herdsman, shunning heat,  
Shelters in cool, and tends his pasturing herds  
At loopholes cut through thickest shade.

These beautiful lines of Milton are by no means overdrawn ; as a banyan tree, with many trunks, forms the most beautiful walks and cool recesses that can be imagined. The leaves are large, soft, and of a lively green ; the fruit is a small fig (when ripe of a bright scarlet), affording sustenance to monkeys, squirrels, peacocks, and birds of various kinds, which dwell among the branches.

The Hindoos are peculiarly fond of this tree ; they consider its long duration, its outstretching arms and overshadowing beneficence, as emblems of the Deity ; they plant it near their dewals or temples ; and in those villages where there is no structure for public worship they place an image under a banyan, and there perform a morning and evening sacrifice.

Many of these beautiful trees have acquired an historic celebrity; and the famous Cubbeer-burr, on the banks of the Nerbuddah, thus called by the Hindoos in memory of a favourite saint, is supposed to be the same as that described by Nearchus, the Admiral of Alexander the Great, as being able to shelter an army under its far-spreading shade. 'High floods have at various times swept away a considerable part of this extraordinary tree, but what still remains is near 2,000 feet in circumference, measured round the principal stems; the overhanging branches not yet struck down cover a much larger space; and under it grow a number of custard-apple and other fruit trees. The large trunks of this single colossus amount to a greater number than the days of the year, and the smaller ones exceed 3,000, each constantly sending forth branches and hanging roots to form other trunks and become the parents of a future progeny.

'About a century ago a neighbouring rajah, who was extremely fond of field diversions, used to encamp under it in a magnificent style, having a saloon, drawing-room, dining-room, bed-chamber, bath, kitchen, and every other accommodation, all in separate tents; yet the noble tree not only covered the whole, together with his carriages, horses, camels, guards, and attendants, but also afforded with its spreading branches shady spots for the tents of his friends, with their servants and cattle. And in the march of an army it has been known to shelter 7,000 men.\* Such is the banyan—more wonderful than all the temples and palaces which the pride of the Moguls has ever reared!

The nearly related Pippul of India, or Bo-tree (*Ficus religiosa*), which differs from the banyan (*F. indica*) by sending down no roots from its branches, is revered by the Buddhists as the sacred plant, under whose shade Gautma, the founder of their religion, reclined when he underwent his divine transfiguration. Its heart-shaped leaves, which, like those of the aspen, appear in the profoundest calm to be ever in motion, are supposed to tremble in recollection of that mysterious scene.

The sacred Pippul at Anarajapoor, the fallen capital of the ancient kings of Ceylon, is probably the oldest *historical tree* in the world; as it was planted 288 years before Christ, and

\* Forbes's 'Oriental Memoirs.'

hence is now 2,150 years old. The enormous age of the baobabs of Senegal, and of the wondrous Wellingtonias of California, can only be conjectured; but the antiquity of the Bo-tree is matter of record, as its preservation has been an object of solicitude to successive dynasties; and the story of its fortunes



THE SACRED BO-TREE OF ANARAJAPOORA.

has been preserved in a series of continuous chronicles amongst the most authentic that have been handed down by mankind.

‘Compared with it, the Oak of Ellerslie is but a sapling, and the Conqueror’s Oak in Windsor Forest barely numbers half its years. The yew trees of Fountains Abbey are believed to have flourished there 1,200 years ago; the olives in the Garden

of Gethsemane were full-grown when the Saracens were expelled from Jerusalem, and the cypress of Somma in Lombardy is said to have been a tree in the time of Julius Cæsar. Yet the Bo-tree is older than the oldest of these by a century, and would almost seem to verify the prophecy pronounced when it was planted, that it would 'flourish and be green for ever.'\*

Although far inferior to these wonders of the vegetable world in amplitude of growth, yet the Teak tree, or Indian oak (*Tectona grandis*), far surpasses them in value, as the ship-worm in the water, and the termite on land, equally refrain from attacking its close-grained strongly scented wood; and no timber equals it for ship-building purposes.

It grows wild over a great part of British India; in the mountainous districts along the Malabar coast, in Guzerat, the valley of the Nerbuddah, in Tenasserim and Pegu. Unlike the oak and fir forests of Europe, where large spaces of ground are covered by a single species, the teak forests of India are composed of a great variety of trees, among which the teak itself does not even predominate. After a long neglect, which, in some parts, had almost caused its total extirpation, Government has at length taken steps for its more effectual protection, and appointed experienced foresters to watch over this invaluable tree. Since 1843, millions of young plants have been raised from seeds, but unfortunately the teak is of as slow growth as our oak, and many years will still be necessary to repair the ruinous providence of the past.

On turning our attention to America we find that Nature, delighting in infinite varieties of development, and disdaining a servile copy of what she had elsewhere formed, covers the earth with new and no less remarkable forms of vegetation. Thus, while in Africa the baobab attracts the traveller's attention by its colossal size and peculiarity of growth, the gigantic Ceiba (*Bombax Ceiba*), belonging to the same family of plants, raises his astonishment in the forests of Yucatan. Like the baobab, this noble tree rises only to a moderate height of sixty feet, but its trunk swells to such dimensions that fifteen men are hardly able to span it, while a thousand may easily screen themselves under its canopy from the scorching sun. The leaves fall off

\* Tennent's 'Ceylon,' vol. ii. pp. 614, 618.

in January; and then at the end of every branch bunches of large, glossy, purple-red flowers make their appearance, affording, as one may well imagine, a magnificent sight.

In British Honduras the Mahogany-tree (*Swietenia Mahagoni*) is found scattered in the forests, attracting the woodman's attention from a distance by its light-coloured foliage, and its magnificent growth. Such are its dimensions, and such is the value of peculiarly fine specimens, that in October 1823 a tree was felled which weighed more than seven tons, and at Liverpool was sold for 525*l.* The expense of sawing amounted to 750*l.* more: so that the wood of this single tree, before passing into the hands of the cabinet-maker, was worth as much as a moderately sized farm.

'Heedless and bankrupt in all curiosity must he be,' says Waterton,\* 'who can journey through the forests of Guiana without stopping to take a view of the towering Mora (*Mora excelsa*). Its topmast branch, when naked with age, or dried by accident, is the favourite resort of the toucan. Many a time has this singular bird felt the shot faintly strike him from the gun of the fowler beneath, and owed his life to the distance betwixt them. The wild fig tree, as large as a common English apple-tree, often rears itself from one of the thick branches at the top of the mora; and when its fruit is ripe, to it the birds resort for nourishment. It was to an indigested seed passing through the body of this bird, which had perched on the mora, that the fig tree first owed its elevated station there. The sap of the mora raised it into full bearing; but now, in its turn, it is doomed to contribute a portion of its own sap and juices towards the growth of different species of vines, the seeds of which also the birds deposited on its branches. These soon vegetate and bear fruit in great quantities; so, what with their usurpation of the resources of the fig-tree, and the fig-tree of the mora, the mora, unable to support a charge which Nature never intended it should, languishes and dies under its burden; and then the fig-tree and its usurping progeny of vines, receiving no more succour from their late foster-parent, droop and perish in their turn.'

Our stateliest oaks would look like pygmies near this 'chieftain of the forests,' who raises his dark green cupola over all

\* 'Wanderings,' p. 5.

the neighbouring trees, and deceives the traveller, who fancies that a verdant hill is rising before him. Its wood is much firmer than that of the fir, and is, or will be, of great importance to the ship-builder. On the Upper Barima alone, a river of Guiana hardly even known by name in Europe, Schomburgk found the giant tree growing in such profusion that it could easily afford sufficient timber for the proudest fleet that ever rode the ocean.

The graceful tapering form of the *Gramineæ*, or grasses, belongs to every zone; but it is only in the warmer regions of the globe that we find the colossal *Bambusaceæ*, rivalling in grandeur the loftiest trees of the primeval forest.

In New Grenada and Quito the *Guadua*, one of these giant grasses, ranks next to the sugar-cane and maize as the plant most indispensable to man. It forms dense jungles, not only in the lower regions of the country, but in the valleys of the Andes, 5,000 feet above the level of the sea. The culms attain a thickness of six inches, the single joints are twenty inches long, and the leaves are of indescribable beauty. A whole hut can be built and thatched with the *guadua*, while the single joints are extensively used as water-vessels and drinking-cups.

India, South China, and the Eastern Archipelago are the seats of the real bamboos, which grow in a variety of genera and species, as well on the banks of lakes and rivers in low marshy grounds, as in the more elevated mountainous regions. They chiefly form the impenetrable jungles, the seat of the tiger and the python. Sometimes a hundred culms spring from a single root, not seldom as thick as a man, and towering to a height of eighty or a hundred feet. Fancy the grace of our meadow grasses, united with the lordly growth of the Italian poplar, and you will have a faint idea of the beauty of a clump of bamboos.

The variety of purposes to which these colossal reeds can be applied almost rivals the multifarious uses of the cocoa-nut palm itself. Splitting the culm in its whole length into very thin pieces, the industrious Chinese then twist them together into strong ropes, for tracking their vessels on their numerous rivers and canals. The sails of their junks, as well as their cables and rigging, are made of bamboo; and in the southern province of Sechuen, not only nearly every house is built solely

of this strong cane, but almost every article of furniture which it contains—mats, screens, chairs, tables, bedsteads, bedding—is of the same material. From the young shoots they also fabricate their fine writing-paper, which is so superior to the produce of our own manufactories. Although the bamboo grows spontaneously and most profusely in nearly all the southern portion of their vast empire, they do not entirely rely on the beneficence of Nature, but cultivate it with the greatest care. They have treatises devoted solely to this subject, laying down rules derived from experience, and showing the proper soils, the best kinds of water, and the seasons for planting and transplanting the bamboos, whose use is scarcely less extensive throughout the whole East Indian world.

At one season of the year the bamboos are easily destroyed by fire; and as the great stem-joints burst from the expansion of the air confined within, the report almost rivals the roar of cannon. In Sikkim firing the jungle is a frequent practice, and Dr. Hooker, who often witnessed the spectacle, describes the effect by night as exceedingly grand. ‘Heavy clouds canopy the mountains above, and, stretching across the valleys, shut out the sky; the air is a dead calm, as usual in the deep gorges; and the fires, invisible by day, are seen raging all around, appearing to an inexperienced eye in all but dangerous proximity. The voices of birds and insects being hushed, nothing is audible but the harsh roar of the rivers, and occasionally rising far above it, that of the forest fires. At night we were literally surrounded by them; some smouldering like the shale-heaps at a colliery, others fitfully bursting forth, whilst others again stalked along with a steadily increasing and enlarging flame, shooting out great tongues of fire, which spared nothing as they advanced with irresistible might. At Darjiling the blaze is visible, and the deadened reports of the bamboos bursting is heard throughout the night; but in the valley, and within a mile of the scene of destruction, the effect is the most grand, being heightened by the glare reflected from the masses of mist which hover above.’\*

The aloes form the strongest contrast to the airy lightness of the grasses, by the stately repose and strength of their thick,

\* ‘Himalayan Journals,’ vol. i. p. 146.

fleshy, and inflexible leaves. They generally stand solitary in the parched plains, and impart a peculiarly austere or melancholy character to the landscape. The real aloes are chiefly African, but the American yuccas and agaves have a similar physiognomical character. The *Agave americana*, the usual ornament of our hot-houses, bears on a short and massive stem a tuft of fleshy leaves, sometimes no less than ten feet long, fifteen inches wide, and eight inches thick! After many years a flower-stalk twenty feet high shoots forth in a few weeks from the heart of the plant, expanding like a rich candelabrum, and clustered with several thousands of greenish-yellow aromatic flowers. But a rapid decline succeeds this brilliant efflorescence, for it is soon followed by the death of the exhausted plant.

In Mexico, where the agave is indigenous, and whence it has found its way to Spain and Italy, it is reckoned one of the most valuable productions of Nature. At the time when the flower-stalk is beginning to sprout, the heart of the plant is cut out, and the juice, which otherwise would have nourished the blossom, collects in the hollow. About three pounds exude daily, during a period of two or three months. After standing for a short time, the sweet juice undergoes a vinous fermentation, and the stranger, when once accustomed to its disagreeable odour, prefers the *pulque* to all other wines, and joins in the enthusiastic praises of the Mexican.

The American bromelias likewise resemble the aloes of torrid Africa by the form and arrangement of their leaves. To this useful family belongs the pine-apple (*Bromelia Ananas*), which grows best and largest in Brazil, where it is so common that the pigs fatten on the fruit. Formerly confined in our country to the tables of the wealthier classes as long as it was only supplied by our hot-houses, it can now be enjoyed at a very moderate expense, since thousands are imported by every West Indian steamer.

The leaves of several species of bromelia furnish excellent twine for ropes. The inhabitants of the banks of the river San Francisco, in Brazil, weave their fishing-nets with the fibres of the Caroa (*B. variegata*), and the filaments of the Crauata de rede (*B. sagenaria*) furnish a cordage of amazing strength and durability.

The foliage of the screw-pines, so widely extended over the

East Indian and South Sea Isles, where they form a prominent feature in the landscape, closely resembles that of the bromelias, while the stem (round which the serrated leaves ascend in spiral convolutions, till they terminate in a pendulous crown), the aërial roots, and the fruit, remind one of the palms, the mangroves, and the coniferæ.

The *Pandanus odoratissimus*, or sweet-smelling screw-pine, whose fruits, when perfectly mature, resemble large rich-coloured pine-apples, plays an important part in the household economy of the coral-islanders of the South Sea. The inhabitants of the Mulgrave Archipelago, where the cocoa-nut is rare, live almost exclusively on the juicy pulp and the pleasant kernels of the fruit. The dried leaves serve to thatch their cottages, or are made use of as a material for mats and raiment. The wood is hard and durable. They string together the beautiful red and yellow-coloured nuts for ornaments, and wear the flowers as garlands. When the tree is in full blossom, the air around is impregnated with a delicious odour.

The grotesque forms of the Cactuses possess the stiff rigidity of the aloes. Their fleshy stems, covered with a gray-green coriaceous rind, generally exhibit bunches of hair and thorns instead of leaves. The angular columns of the Cerei, or torch-cactuses, rise to the height of sixty feet,—generally branchless, sometimes strangely ramified, as candelabras, while others creep like ropes upon the ground, or hang, snake-like, from the trees, on which they are parasitically rooted. The opuntias are unsymmetrically constructed of thick flat joints springing one from the other, while the melon-shaped Echinocacti and Mammillariæ, longitudinally ribbed or covered with warts, remain attached to the soil. The dimensions of these monstrous plants are exceedingly variable. One of the Mexican echinocacti (*E. Visnaga*) measures four feet in height, three in diameter, and weighs about two hundred pounds; while the dwarf cactus (*E. nana*) is so small that, loosely rooted in the sand, it frequently remains sticking between the toes of the dogs that pass over it. The splendidly coloured flowers of the cactuses form a strange contrast to the deformity of their stems, and the spectator stands astonished at the glowing life that springs forth from so unpromising a stock. These strange compounds of ugliness and beauty are in many respects useful to man.

The pulp of the melocacti, which remains juicy during the driest season of the year, is one of the vegetable sources of the wilderness, and refreshes the traveller after he has carefully removed the thorns. Almost all of them bear an agreeable acid fruit, which, under the name of the Indian fig, is consumed in large quantities in the West Indies and Mexico. The light and incorruptible wood is admirably adapted for the construction of oars and many other implements. The farmer fences his garden with the prickly opuntias; but the services which they render, as the plants on which the valuable cochineal insect feeds and multiplies, are far more important.

The cactuses prefer the most arid situation, naked plains, or slopes, where they are fully exposed to the burning rays of the sun, and impart a peculiar physiognomy to a great part of tropical America.

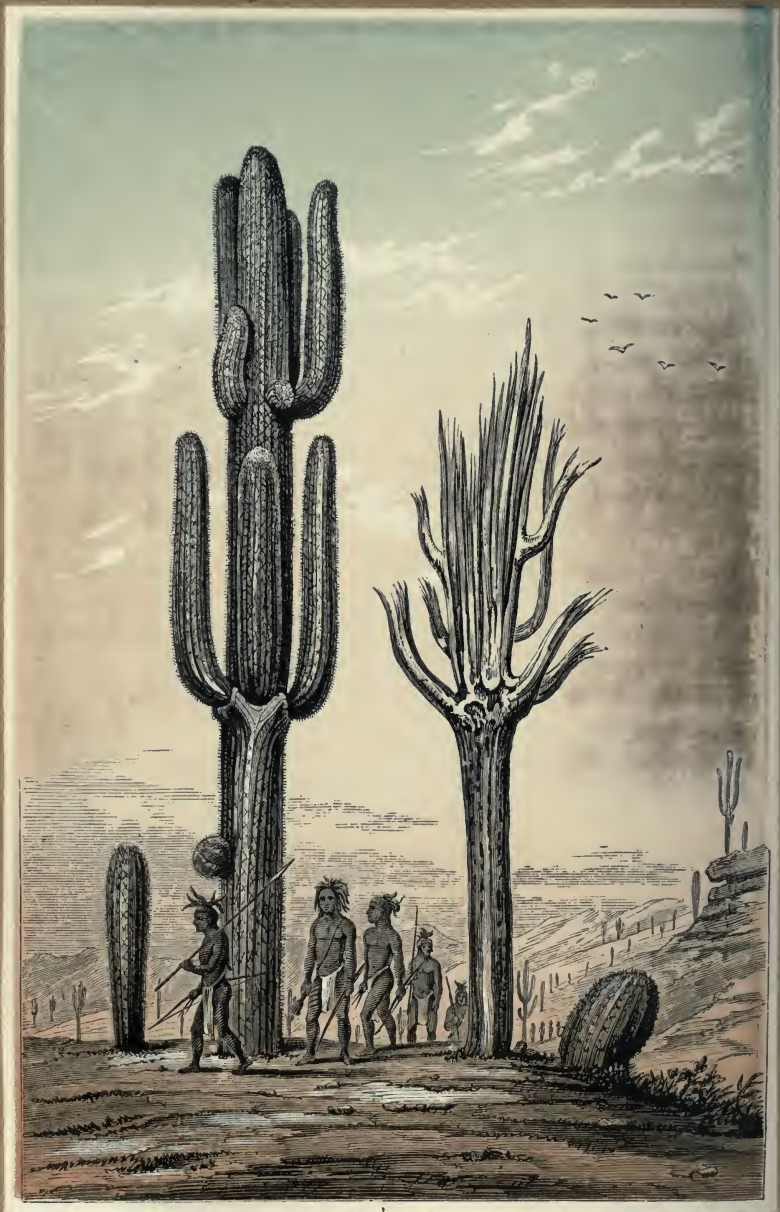
None of the plants belonging to this family existed in the Old World previously to the discovery of America; but some species have since then rapidly spread over the warmer regions of our hemisphere. The Nopal (*Cactus Opuntia*) skirts the Mediterranean along with the American agave, and from the coasts has even penetrated far into the interior of Africa, everywhere maintaining its ground, and conspicuously figuring along with the primitive vegetation of the land.

Although chiefly tropical, the cactuses have a perpendicular range, which but few other families enjoy. From the low sand-coasts of Peru and Bolivia they ascend through vales and ravines to the highest ridges of the Andes. Magnificent dark-brown Peireskias (the only cactus genus bearing leaves instead of prickles) bloom on the banks of the Lake of Titicaca, 12,700 feet above the level of the sea; and in the bleak Puna,\* even at the very limits of vegetation, the traveller is astonished at meeting with low bushes of cactuses thickly beset with yellow prickles.

What a contrast between these deformities and the delicately feathered mimosas, unrivalled among the loveliest children of Flora in the matchless elegance of their foliage! Our common acacias give but a faint idea of the beauty which these plants attain under the fostering rays of a tropical sun. In most species

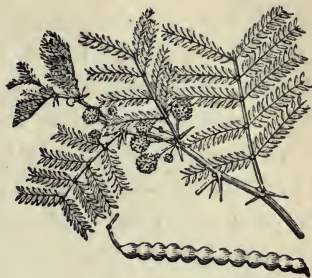
\* See Chapter III.

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CEREUS GIGANTEUS

the branches extend horizontally, or umbrella-shaped, somewhat like those of the Italian pine, and the deep-blue sky shining through the light green foliage, whose delicacy rivals the finest embroidery, has an extremely picturesque effect. Endowed with a wonderful sensibility, many of the mimosas seem, as it were, 'to have outstepped the bounds of vegetable life, and to rival in acuteness of feeling the coral polyps and the sea anemones of the submarine gardens.



MIMOSA.

Large tracts of country in Brazil are almost entirely covered with sensitive plants. The tramp of a horse sets the nearest ones in motion, and, as if by magic, the contraction of the small grey-green leaflets spreads in quivering circles over the field, making one almost believe, with Darwin and Dutrochet, that plants have feeling, or tempting one to exclaim with Wordsworth—

‘It is my faith, that every flower  
Enjoys the air it breathes.’

Among the most remarkable forms of tropical vegetation, the creeping plants, bush-ropes, or lianas (*cissus*, *bauhinia*, *bignonia*, *banisteria*, *passiflora*), that contribute so largely to the impenetrability of the forests, hold a conspicuous rank. Often three or four bush-ropes, like strands in a cable, join tree to tree, and branch to branch; others, descending from on high, take root as soon as their extremity touches the ground, and appear like shrouds and stays supporting the mainmast of a line-of-battle ship; while others send out parallel, oblique, horizontal, and perpendicular shoots in all directions.

No European is able to penetrate the intricate network of a forest thus matted together: astonished and despairing, he stands before the dense cordage that impedes his path, and, should he attempt to force his way through the maze, the strong thorns and hooks with which the tropical creepers are generally armed would soon make him repent of his boldness. The Brazilian planter never thinks of entering the forest without a large knife, or without being accompanied

by slaves, who with heavy scythe-like axes attached to long poles, clear the way by severing the otherwise impenetrable cordage.

The enormous climbing trees, that stifle the life of the mightiest giants of the forest, offer a no less wonderful spectacle. At first, these emblems of ingratitude grow straight upwards like any feeble shrub, but as soon as they have found a support in other trees, they begin to extend over their surface; for, while the stems of other plants generally assume a cylindrical form, these climbers have the peculiarity of divesting themselves of their rind when brought into contact with an extraneous body, and of spreading over it, until they at length enclose it in a tubular mass. When, during this process, the powers of the original root are weakened, the trunk sends forth new props to restore the equilibrium; and thus the tough and hardy race continually acquires fresh strength for the ruin of its neighbours.



POLANARRUA.

Several species of the fig-tree are peculiarly remarkable for this distinctive property, and, from the facility with which their seeds take root where there is a sufficiency of moisture to per-

mit of germination, are formidable assailants of ancient monuments. Sir Emerson Tennent mentions one which had fixed itself on the walls of a ruined edifice at Polanarrua, and formed one of the most remarkable objects of the place, its roots streaming downwards over the walls as if their wood had once been fluid, and following every sinuosity of the building and terraces till they reached the earth.

On the borders of the Rio Guama, Von Martius saw whole groups of Macauba palms encased in fig-trees that formed thick tubes round the shafts of the palms, whose noble crowns rose high above them; and a similar spectacle occurs in India and Ceylon, where the Tamils look with increased veneration on their sacred pippul thus united in marriage with the palmyra. After the incarcerated trunk has been stifled and destroyed, the grotesque form of the parasite, tubular, cork-screw-like, or otherwise fantastically contorted, and frequently admitting the light through interstices like loopholes in a turret, continues to maintain an independent existence among the straight-stemmed trees of the forest—the image of an eccentric genius in the midst of a group of sedate citizens.

Like the mosses and lichens of our woods, parasites of endless variety and almost inconceivable size and luxuriance (ferns, bromelias, tillandsias, orchids, and pothos) cover in the tropical zone the trunks and branches of the forest trees, forming hanging gardens, far more splendid than those of ancient Babylon. While the orchids are distinguished by the eccentric forms and splendid colouring of their flowers, sometimes resembling winged insects or birds, the pothos family (caladium, calla, arum, dracontium, pothos) attract attention by the beauty of their large, thick-veined, generally arrow-shaped, digitated, or elongated leaves, and form a beautiful contrast to the stiff bromelias or the hairy tillandsias that conjointly adorn the knotty stems and branches of the ancient trees.

In size of leaf, the Pothos family is surpassed by the large tropical water-plants, the Nymphæas and Nelumbias, among which the *Victoria regia*, discovered in 1837 by Robert Schomburgk in the river Berbice, enjoys the greatest celebrity. The round light-green leaves of this queen of water-plants measure no less than six feet in diameter, and are surrounded by an elevated rim several inches high, and exhibiting the pale, car-

mine red of the under surface. The odorous white blossoms, deepening into roseate hues, are composed of several hundred petals ; and, measuring no less than fourteen inches in diameter, rival the colossal proportions of the leaves. The Victoria is found all over the Amazon district, but rarely or never in the river itself. It seems to delight in still waters, growing in inlets, lakes, or very quiet branches of the river fully exposed to the sun.

The trunk of several tropical trees offers the remarkable peculiarity of bulging out in the middle like a barrel. In the Brazilian forests, the Pao Barrigudo (*Chorisia ventricosa*) arrests the attention of every traveller by its odd ventricose shape, nearly half as broad in the centre as long, and gradually tapering towards the bottom and the top, whence spring a few thin and scanty branches. It is only by seeing great numbers of these trees all with their character more or less palpable,



BOTTLE-TREE.

that one can believe it is not an accidental circumstance in the individual tree, instead of being truly characteristic of the species.

The Delabechea, or bottle-tree, discovered by Mr. Mitchell in tropical Australia, has the same lumpish mode of growth. Its wood is of so loose a texture that, when boiling water is poured over its shavings, a clear jelly is formed, and becomes a thick viscid mass.

In other trees which, struggling upwards to air and light, attain a prodigious altitude, or from their enormous girth and the colossal expansion of their branches require steadying from beneath, we find buttresses projecting like rays from all sides of the trunk. They are frequently from six to twelve inches thick, and project from five to fifteen feet, and, as they ascend, gradually sink into the bole and disappear at the height of from ten to twenty feet from the ground. By the firm resistance which they offer below, the trees are effectually protected from the leverage of the crown, by which they would otherwise be uprooted. Some of these buttresses are so smooth and flat as almost to resemble sawn planks; as, for instance, in the Bombax Ceiba, one of the most remarkable examples of this wonderful device of Nature.

In other cases we find the roots fantastically spreading and revelling in a variety of grotesque shapes, such as we nowhere find in the less exuberant vegetation of Europe. Thus, in the india-rubber tree (*Ficus elastica*), masses of the roots appear above ground, extending on all sides from the base, and writhing over the surface in serpentine undulations, so that the Indian villagers give it the name of the snake-tree. Sir Emerson

Tennent mentions an avenue of these trees leading to the botanical garden of Peradenia, in Ceylon, the roots of which meet from either side of the road, and have so covered the surface as to form a wooden framework, the interstices of



SNAKE-TREE.

which retain the materials that form the roadway. These tangled roots sometimes trail to such an extent that they

have been found upwards of 140 feet in length, whilst the tree itself was not thirty feet high.

The roots of the Mangroves, which in the tropical zone are found fringing the shores of the sea, or the mouths of rivers, wherever the reflux of the tide exposes a broad belt of alluvial soil, are admirably adapted for securing a footing on the unstable brink of the ocean.

The growth of these salt-water-loving trees (*Rhizophora gymnorhiza*, *R. Mangle*) is equally peculiar and picturesque.



MANGROVE.

The seeds germinate on the branches, and, increasing to a considerable length, finally fall down into the mud, where they stick, with their sharp point buried, and soon take root.

As the young mangrove grows upwards, pendulous roots issue from the trunk and low branches, and ultimately strike into the muddy ground, where they increase to the thickness of a man's leg; so that the whole has the appearance of a complicated series of loops and arches, from five to ten feet high, supporting the body of the tree like so many artificial stakes.

It may easily be imagined what dense and inextricable thickets, what incomparable breakwaters, plants like these—through whose mazes even the light-footed Indian can only penetrate by stepping from root to root—are capable of forming.

Their influence in promoting the growth of land is very great, and in course of time they advance over the shallow borders of the ocean. Their matted roots stem the flow of the waters, and, retaining the earthy particles that sink to the bottom between them, gradually raise the level of the soil. As the new formation progresses, thousands of seeds begin to germinate upon its muddy foundation, thousands of cables descend, still farther to consolidate it; and thus foot by foot, year after year, the mangroves extend their empire and encroach upon the maritime domains.

The enormous deltas of many tropical rivers partly owe their immense development to the unceasing expansion of these littoral woods; and their influence should by no means be overlooked by the geologist when describing the ancient and eternal strife between land and ocean.

When the waters retire from under the tangled arcades of the mangroves, the black mud, which forms the congenial soil of these plants, appears teeming with a boundless variety of life. It absolutely swarms with the lower marine animals, with myriads of holothurians, annelides, sea-urchins, entomostraca, paguri, and crabs, whose often brilliantly coloured carapaces form a strong contrast to the black ooze in which they are seen to crawl about. Life clings even to the roots and branches bathed by the rising floods; for they are found covered with muscles, barnacles, and oysters, which thus have the appearance of growing upon trees, and pass one-half of their existence under water, the other in the sultry atmosphere of a tropical shore.

The close-eyed Gudgeon (*Periophthalmus*), or 'Jumping Johnny,' as he is more familiarly named by the sailors, plays a conspicuous part in the animal world of the mangrove swamps, where the uncouth form of this strange amphibious fish may be seen jumping about in the mud like a frog, or sliding awkwardly along on its belly with a gliding motion. By means of its pectoral fins, it is even enabled to climb

with great facility among the roots of the mangroves, where it finds a goodly harvest of minute crustaceans. It must, however, not be supposed that 'Johnny' has all the swamp to himself; for though he manages to swallow many a victim, he is not seldom doomed to become the prey of creatures more wily or stronger than himself. A large and powerful crab of the *Grapsus* family may often be observed stealing, with an almost imperceptible motion, and in a cautious, sidelong manner, towards a gudgeon basking on the shore, and, before the fish has time to plunge into the sea, the pincer of the crab secures it in a vice-like gripe, from which it is perfectly hopeless to escape.

'Johnny' is a pugnacious little fellow, and rather prolonged fights may be observed between him and his brethren. At the mouth of the Zambesi, Dr. Livingstone saw one which, in fleeing from an apparent danger, jumped into a pool a foot square, which another evidently regarded as his by prior discovery. In a twinkling the owner, with eyes flashing fury, and with dorsal fin bristling up in a rage, dashed at the intruding foe. The fight waxed furious. No tempest in a teapot ever equalled the storm of that miniature sea. The warriors were now in the water and anon out of it, for the battle raged on sea and shore. They struck hard, they bit each other, until becoming exhausted, they seized each other by the jaws like two bull-dogs. They paused for breath, and were at it again as fiercely as before, until the combat ended by the precipitate retreat of the invader.

The vast multitude of marine animals which peoples the mangrove swamps naturally attracts a great number of strand, lacustrine, and sea birds; for it would be strange, indeed, if guests were wanting where the table is so prodigally supplied. The red ibis, the snow-white egret, the rosy spoonbill, the tall flamingo, and an abundance of herons and other water-fowl, love to frequent the mangrove thickets, enhancing by their magnificent plumage the beauty of the scene. For, however repulsive may be the swampy ground on which these strange trees delight, yet their bright green foliage, growing in radiated tufts at the ends of the branches, and frequently bespangled with large gaily-coloured flowers, affords a most pleasing spectacle. Many an interesting discovery would

here, no doubt, reward the naturalist's attention ; but the mangroves know well how to keep their secrets, and to repel the curiosity of man. Should he attempt to invade their domains, clouds of bloodthirsty insects would instantly make him repent of his temerity ; for the plague of the mosquitoes is nowhere more dreadful than in the thickets of the semi-aquatic *Rhizophoræ*. And supposing his scientific zeal intense enough to bid defiance to the torture of their stings, and to scorn the attacks of every other visible foe—insect or serpent, crocodile or beast of prey—that may be lurking among the mangroves, yet the reflection may well bid him pause, that poisonous vapours, pregnant with cholera or yellow fever, are constantly rising from that muddy soil. Even in the temperate regions of Europe the emanations from marshy grounds are pregnant with disease, but the malaria ascending from the sultry morasses of the torrid zone is absolutely deadly.

Thus there cannot possibly be a better natural bulwark for a land than to be belted with mangroves ; and if Borneo, Madagascar, Celebes, and many other tropical islands and coasts, have to the present day remained free from the European yoke, they are principally indebted for their independence to the miasms and tangles of a *Rhizophora* girdle, bidding defiance alike to the sharp edge of the axe or the destructive agency of fire.

As the mangroves are found in places suited to their growth throughout the whole torrid zone, it is not surprising that there are many species, some rising to the height of stately trees, while others are content with a shrub-like growth. Some are peculiar to America, others to the Old World ; some grow near the sea, others prefer a brackish water and the low swampy banks of rivers.

The *Jriarteas* and *Screw-pines* are as singular as the mangroves in the formation of their roots ; but those of the *Lum*, a large tree which Kittlitz found growing on the island of Ualan, are perhaps without a parallel in the vegetable world. Each of the roots, running above-ground for a considerable distance, is surmounted by a perfectly vertical crest, gradually diminishing in size as the root recedes from the trunk, but often three, or even four, feet high near its base. These crests, which are very thin but perfectly smooth, regularly follow all the sinuosities of the root, and thus form, for a considerable dis-

tance round the tree, a labyrinth of the strangest appearance. Large spaces of swampy ground are often covered with their windings, and it is no easy matter to walk on the sharp edges of these vertical bands, whose interstices are generally filled with deep mud. On being struck, the larger crests emit a deep sonorous sound, like that of a kettledrum.

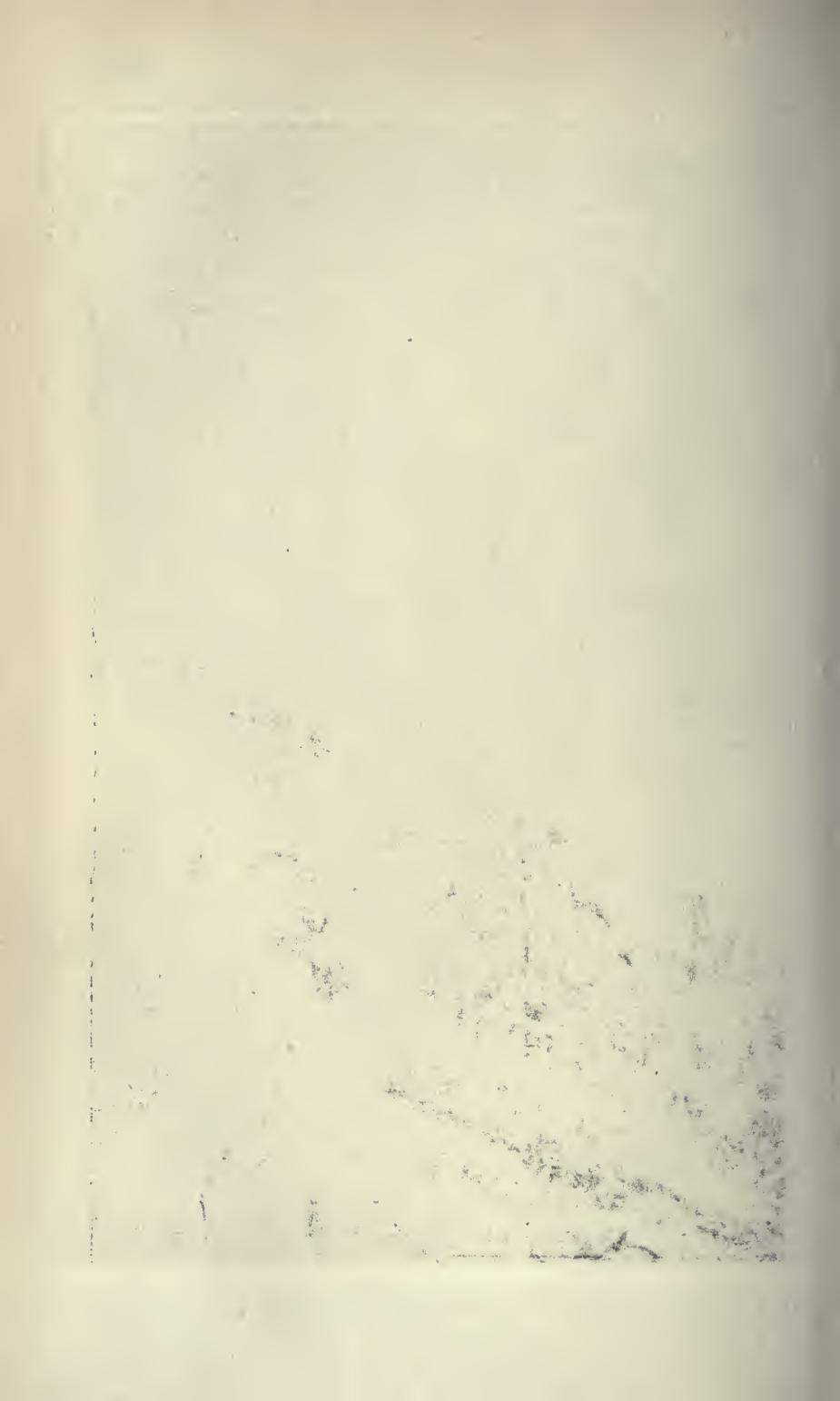
The thorns and spines with which many European plants are armed, give but a faint idea of the size which these defensive weapons attain in the tropical zone. The cactuses, the acacias, and many of the palm-trees, bristle with sharp-pointed shafts, affording ample protection against the attacks of hungry animals, and might appropriately be called vegetable hedge-hogs, or porcupines. The *Toddalia aculeata*, a climbing plant, very common in the hill-jungles of Ceylon, is thickly studded with knobs, about half an inch high, and from the extremity of each a thorn protrudes, as large and sharp as the bill of a sparrow-hawk.

The black twigs of the buffalo-thorn (*Acacia latronum*), a low shrub abounding in northern Ceylon, are beset at every joint by a pair of thorns set opposite each other, like the horns of an ox, as sharp as a needle, from two to three inches in length, and thicker at the base than the stem they grow on; and the *Acacia tomentosa*, another member of the same numerous genus, has thorns so large as to be called the jungle-nail by Europeans, and the elephant-thorn by the natives. In some of these thorny plants, the spines grow, not singly, but in branching clusters, each point presenting a spike as sharp as a lancet; and where these shrubs abound, they render the forest absolutely impassable, even to animals of the greatest size and strength.

The formidable thorny plants of the torrid zone, which are often made use of by man to protect his fields and plantations against wild beasts and robbers, have sometimes even been made to serve as a bulwark against hostile invasions. Thus Sir Emerson Tennent informs us, that, during the existence of the Kandyan kingdom, before its conquest by the British, the frontier forests were so thickened and defended by dense plantations of thorny plants as to form a natural fortification impregnable to the feeble tribes on the other side; and at each pass which led to the level country, movable gates,



THE LUM TREE



formed of the same thorny beams, were suspended as an ample security against the incursions of the naked and timid lowlanders.

Poets and moralists, judging by what they see in England, have concluded that fruits of a small size, whose fall cannot be dangerous to man, invariably grow on high trees, while large fruits, such as the pumpkin, are only found trailing on the ground. But a visit to the tropics would soon convince them of their error, for two of the largest and heaviest fruits known, the Brazilian nut (*Bertholletia*) and the Durian of the Indian Archipelago, grow on high forest trees, from which they fall down when ripe, and frequently wound or kill the natives. 'From this,' says Mr. Wallace, 'we can learn two things—in the first place, not to draw general conclusions from a locally very limited knowledge of nature, and, secondly, that trees and fruits, as well as the manifold productions of the animal kingdom, have not been exclusively organised with a reference to man.'



A CEYLONESE COCOA-NUT OIL-MILL.

## CHAPTER XIII.

### PALMS AND FERNS.

The Cocoa-nut Tree—Its hundred Uses—Cocoa-nut Oil—Coir—Porcupine Wood—  
 Enemies of the Cocoa Palm—The Sago Palm—The Sagner—The Gumatty—  
 The Areca Palm—The Palmyra Palm—The Talipot—The Cocoa de Mer—  
 Ratans—A Ratan bridge in Ceylon—The Date Tree—The Oil Palms of Africa—  
 The Oil Trade at Bonny—Its vast and growing Importance—American Palms—  
 The Carnauba—The Ceroxylon andicola—The Cabbage Palm—The *Gulielma*  
*speciosa*—The *Piacava*—Difficulties of the Botanist in ascertaining the  
 various species of Palms—Their wide geographical range—Different Phy-  
 siognomy of the Palms according to their height—The Position and Form of  
 their Fronds—Their Fruits—Their Trunk—The *Yriartea ventricosa*—Arbores-  
 cent Ferns.

THE graceful acanthus gave the imaginative Greeks the first  
 idea of the Corinthian capital; but the shady canopy of  
 the cocoa-nut tree would no doubt form a still more beautiful  
 ornament of architecture, were it possible for art to imitate its  
 feathery fronds and carve their delicate tracery in stone.

Essentially littoral, this noble palm requires an atmosphere  
 damp with the spray and moisture of the sea to acquire its full  
 stateliness of growth, and while along the bleak shores of the  
 Northern Ocean the trees are generally bent landward by the  
 rough sea breeze, and send forth no branches to face its violence,  
 the cocoa, on the contrary, loves to bend over the rolling surf,  
 and to drop its fruits into the tidal wave. Wafted by the winds

and currents over the sea, the nuts float along without losing their germinating power, like other seeds which migrate through the air; and thus, during the lapse of centuries, the cocoa-palm has spread its wide domain from coast to coast throughout the whole extent of the tropical zone. It waves its graceful fronds over the emerald islands of the Pacific, fringes the West Indian shores, and from the Philippines to Madagascar crowns the atolls, or girds the sea-border of the Indian Ocean.

But nowhere is it met with in such abundance as on the coasts of Ceylon, where for miles and miles one continuous grove of palms, preeminent for beauty, encircles the 'Eden of the eastern wave.' Multiplied



COCOA-NUT TREE.

by plantations and fostered with assiduous care, the total number in the island cannot be less than twenty millions of full-grown trees; and such is its luxuriance in those favoured districts, where it meets with a rare combination of every advantage essential to its growth—a sandy and pervious soil, a free and genial air, unobstructed solar heat, and abundance of water—that, when in full bearing, it will annually yield as much as a ton weight of nuts—an example of fruitfulness almost unrivalled even in the torrid zone.

No other tree in the world, no other plant cultivated by man, contributes in *so many ways* to his wants and comfort as this inestimable palm; and it is a curious illustration of its innumerable uses, that some years ago a ship from the Maldivé Islands touched at Galle, which was entirely built, rigged, provisioned, and laden with the produce of the cocoa-tree. Besides furnishing their chief food to many tribes on the coast within the torrid zone, the nut contains a valuable oil, which burns without smoke or smell, and serves, when fresh, for culinary purposes. Consisting of a mixture of solid (*stearine*) and fluid

(*elain*) fat, it congeals at a temperature of  $72^{\circ}$ ; but both its component substances acquire additional value after having been separated by means of the hydraulic press; for while the liquid part furnishes an excellent lamp-oil, the solid fat is manufactured into candles rivalling wax, and at the same time not much dearer than tallow.

This important product first became known in the European markets at the beginning of the present century, and is now a considerable article of commerce, so that, to meet the constantly increasing demand, new plantations are continually forming on the coasts of Ceylon, Java, and other islands of the Indian Ocean.

The fibrous rind or husk of the nut furnishes coir, a scarcely less important article of trade than the oil itself. It is prepared by being soaked for some months in water, for the purpose of decomposing the interstitial pith, after which it is beaten to pieces until the fibres have completely separated, and ultimately dried in the sun. Ropes made of coir, though not so neat in appearance as hempen cords, are superior in lightness, and exceed them in durability, particularly if wetted frequently by salt water. From their elasticity and strength they are exceedingly valuable for cables. Besides cordage of every calibre, beds, cushions, carpets, brushes, and nets are manufactured from the filaments of the cocoa-nut husk, while the hard shell is fashioned into drinking-cups, spoons, beads, bottles, and knife-handles. From the spathes of the unopened flowers a delicious 'toddy' is drawn, which, drunk at sunrise before fermentation has taken place, acts as a cooling gentle aperient, but in a few hours changes into an intoxicating wine, and may either be distilled into arrack—the only pernicious purpose to which the gifts of the bounteous tree are perverted—or soured into vinegar, or inspissated by boiling into sugar.

The strong tough foot-stalks of the fronds, which attain a length of from eighteen to twenty feet, are used for fences, for yokes, for carrying burthens on the shoulders, for fishing-rods; the leaflets serve for roofing, for mats, for baskets, for cattle-fodder; and their midribs form good brooms for the decks of ships. Cooked or stewed, the cabbage or cluster of unexpanded leaves is an excellent vegetable, though rarely used, as it necessarily involves the destruction of the tree; and even the

tough web or network, which sustains the foot-stalks of the leaves, may be stripped off in large pieces and used for straining.

After the cocoa-nut tree has ceased to bear, its wood serves for many valuable purposes—for the building of ships, bungalows, and huts, for furniture and farming implements of every description.

When we consider the numerous gifts conferred upon mankind by this inestimable tree, we cannot wonder at the animation with which the islander of the Indian Ocean recounts its 'hundred uses,' or at the superstition which makes him believe that, by some mysterious sympathy, it pines when beyond the reach of the human voice. But man is not the only being that profits by its gifts, for wherever it grows, its sweet and nutritious nuts are eagerly sought for by many animals. The small black long-clawed cocoa-nut bear (*Ursus malayanus*), which inhabits Sumatra and Borneo, and surpasses all other members of the Ursine family by its surprising agility in climbing, though far from despising other fruit, yet shows by its name to which side its inclinations chiefly lean. The East Indian



MALAY BEAR.



PALM SQUIRREL.

Palm-martin (*Paradoxurus typus* or *Pougouni*) and the sprightly Palm-squirrel (*Sciurus palmarum*) likewise climb the cocoa-palms, and, perforating the soft and unripe nuts, eagerly sip their juice. The ubiquitous Rat bites holes into the cocoa-nuts close to their stalk, taking good care not to gnaw the shell where the juice would run out and defraud it of its meal.

Even the birds diminish the produce of the cocoa-nut grove. The Noddy (*Sterna stolidus*) builds his nest between the foot-stalks, and picks so busily at the blossom, when stormy weather prevents him making any long excursions, that on many islands he is considered as a chief cause of the sterility of numerous palms.

In every zone we find nations in a low degree of civilisation living almost exclusively upon a single animal or plant. The Laplander has his reindeer, the Esquimaux his seal, the Sandwich Islander his taro-root ; and thus also we find the natives of a great part of the Indian Archipelago depending for their subsistence upon the pith of the Sago palm (*Sagus fariniferus*). This tree, which is of such great importance to the indolent Malay, as it almost entirely relieves him of the necessity of labour, grows at first very slowly, and is covered with thorns. As soon, however, as the stem is once formed, it shoots upwards with such rapidity that it speedily attains its full height of ten yards, with a girth of five or six feet, losing in this stage its thorny accompaniments. The crown is larger and thicker than that of the cocoa-nut tree; the efflorescence colossal, forming an immense bunch, the branches of which spread out like the arms of a gigantic candelabrum. The tree must, however, be felled before the fruit begins to form, as otherwise the farina would be exhausted, which man destines for his food. When the trunk has been cut and split into convenient pieces, the pith is scooped out, kneaded with water, and strained, to separate the meal from the fibres. One tree will produce from two to four hundredweight of flour, which is mostly consumed on the spot. The Sago palm serves to feed several millions of men, and a great quantity of its produce is exported to Europe.

The Sago palm forms large forests, particularly on swampy ground in Borneo and Sumatra, in the Moluccas and New Guinea. Mushrooms of an excellent flavour frequently cover the mouldering trunks, and in the pith the fat grubs of the *Cossus saguarius*, a large lamellicorn beetle, are found, which the natives consider a great delicacy when roasted.

The Gomuti (*Gomutus vulgaris*), which almost rivals the cocoa by the multiplicity of its uses, is likewise a native of the Indian Archipelago. On seeing its rough and swarthy rind, and the dull dark-green colour of its fronds, the stranger wonders how the unsightly tree is allowed to grow, but when he has tasted its delicious wine he is astonished not to see it cultivated in greater numbers. Although the outer covering of the fruits has venomous qualities, and is used by the Malays to poison springs, the nuts have a delicate flavour, and the wounded spathe yields an excellent toddy, which, like that of

the cocoa and palmyra palms changes by fermentation into an intoxicating wine, and on being thickened by boiling furnishes a kind of black sugar, much used by the natives of Java and the adjacent isles. The reticulum or fibrous net at the base of the petioles of the leaves constitutes the gumatty, a substance admirably adapted to the manufacture of cables, and extensively used for cordage of every description. The small hard twigs found mixed up with this material are employed as pens, besides forming the shafts of the sumpits or poisoned arrows of the Malays, and underneath the reticulum is a soft silky material, used as tinder by the Chinese, and applied as oakum in caulking the seams of ships, while from the interior of the trunk a kind of sago is prepared.

The Areca palm (*Areca Catechu*) bears a great resemblance to the cocoa-nut tree, but is of a still more graceful form, rising to the height of forty or fifty feet, without any inequality on its thin polished stem, which is dark green towards the top, and sustains a crown of feathery foliage, in the midst of which are clustered the astringent nuts, for whose sake it is carefully tended. In the gardens of Ceylon the areca palm is invariably planted near the wells and watercourses, and the betel plant, which immemorial custom has associated to its use, is frequently seen twining round its trunk.

The Palmyra palm (*Borassus flabelliformis*) celebrated in verse and prose for the numerous benefits it confers upon mankind, extends from the confines of Arabia to the Moluccas, and is found in every region of Hindostan from the Indus to Siam, the cocoa and the date tree being probably the only palms that enjoy a still wider geographical range. In northern Ceylon, and particularly in the peninsula of Jaffna, it forms extensive forests; and such is its importance in the Southern Dekkan, and along the Coromandel coast, that its fruits afford a compensating resource to seven millions of Hindoos on every occasion of famine or failure of the rice crop. Unlike the cocoa, which gracefully bends under its ponderous crown, the palmyra rises vertically to its full height of seventy or eighty feet, and presents a truly majestic sight when laden with its huge clusters of fruits, each the size of an ostrich's egg, and of a rich brown tint, fading into bright golden at its base. It is not till the tree has attained a mature age that its broad fan-like

leaves begin to detach themselves from the stem ; they climb from the ground to its summit in spiral convolutions, forming a dense cover for many animals—ichneumons, squirrels, and monkeys, that resort to it for concealment. In these hiding-places the latter might easily defy the sportsman ; but they frequently fall victims to a silly curiosity, for when he is accompanied by his dog, they cannot resist the temptation of watching the animal's movements, and, coming forth to peep, expose themselves to a fatal shot.

The stalks of the decayed leaves remain partly attached to the trunk, affording supports to a profusion of climbing and epiphytic plants, which hide the stem under a brilliant tapestry of flower and verdure.

When the spathes of the fruit-bearing trees exhibit themselves, the toddy-drawer forthwith commences his operations, climbing by the assistance of a loop of flexible jungle-vine, sufficiently wide to admit both his ankles and leave a space between them, thus enabling him to grasp the trunk of the tree with his feet and support himself as he ascends. Having pruned off the stalks of fallen leaves, and cleansed the crown from old fruit-stalks and other superfluous matter, he binds the spathes tightly with thongs to prevent them from farther expansion, and descends, after having thoroughly bruised the embryo flowers within to facilitate the exit of the juice. For several succeeding mornings the operation of crushing is repeated, and each day a thin slice is taken off the end of the racemes, to facilitate the exit of the sap and prevent its bursting the spathe. About the eighth morning the sap begins to exude, an event which is notified by the immediate appearance of birds, especially of the 'toddy bird,' a species of shrike, (*Artamus fuscus*), attracted by the flies and other insects which come to feed on the luscious juice of the palm. The crows, ever on the alert when any unusual movement is in progress, keep up a constant chattering and wrangling ; and about this time the palmyra becomes the resort of the palm-martin and the graceful genet, which frequent the trees in quest of birds. On ascertaining that the first flow of the sap has taken place, the toddy-drawer again trims the wounded spathe, and inserts its extremity in an earthen chatty to collect the juice. Morning and evening these vessels are emptied, and for four

or five months the palmyra will continue to pour forth its sap at the rate of three quarts a day. But once in every three years the operation is omitted, and the fruit is allowed to form, without which the natives assert that the tree would pine and die.\* The hard and durable wood of the palmyra, which, consisting like the other palms of straight horny fibres, can easily be split into lengths, is said to resist the attacks of the termites, and is used universally in Ceylon and India for roofing and similar purposes. The leaves, finally, are employed for roofs, fences, mats, baskets, fans, and paper.

The Talpot or Talipot of the Singalese (*Corypha umbraculifera*) rises to the height of one hundred feet, and expands into a crown of enormous fan-like leaves, each of which when laid upon the ground will form a semicircle of sixteen feet in diameter, and cover an area of nearly two hundred superficial feet. These gigantic foliaceous expansions are employed by the Singalese for many purposes. They form excellent fans, umbrellas, or portable tents, one leaf being sufficient to shelter seven or eight persons; but their most interesting use is for the manufacture of a kind of paper, so durable as to resist for many ages the ravages of time. The leaves are taken, whilst still tender, cut into strips, boiled in spring water, dried, and finally smoothed and polished, so as to enable them to be written on with a style, the furrow made by the pressure of the sharp point being rendered visible by the application of charcoal ground with a fragrant oil. The leaves of the palmyra similarly prepared are used for ordinary purposes; but the valuable documents are written to-day, as they have been for ages past, on strips of the talipot.

The currents of the sea sometimes drift to the shores of the Maldives, and even to the south and west coasts of Java and Sumatra, a nut, exceeding the ordinary cocoa-nut many times in size, with the additional peculiarity of presenting a double, or sometimes even a triple form, as if two separate fruits had grown together. These mysterious gifts of the ocean, the product of an unknown tree were believed to be of submarine origin, and to have the wonderful power of neutralising poisons. On the Maldivé Islands they were the exclusive property of the king, who either sold them at an exorbitant price, or made

\* Tennent's 'Ceylon,' vol. ii. p. 523.

presents of them to other potentates. At length, about a hundred years ago, the French traveller Sonnerat discovered in the uninhabited Seychelles the home of the *Lodoicea Sechellarum*, which, like the cocoa, grows on the strand of that small and secluded group, and drops its large nuts into the sea, which then carries them along to the east. The trunk of the *Lodoicea* rises to the height of forty or fifty feet, and bears a crown of immense fan-like leaves, upwards of twenty feet long and fifteen broad, with foot-stalks seven feet long. As soon as the real origin of the wonderful drift nuts became known, they of course immediately lost their imaginary value, to the great vexation, no doubt, of the Maldivé potentate, who thus found himself deprived of the best part of his scanty revenues.

The Ratans, a most singular genus of creeping plants, luxuriate in the forests of tropical Asia. Sometimes their slender stems, armed with dreadful spines at every joint, climb to the summit of the highest tree; sometimes they trail along the ground; and while it is impossible to find out their roots among the intricate tangles of the matted underwood, their palm-like tops expand in the sunshine, the emblems of successful parasitism. They frequently render the forest so impervious, that the distinguished naturalist Junghuhn, while exploring the woods of Java, was obliged to be accompanied by a vanguard of eight men, one-half of whom were busy cutting the ratans with their hatchets, while the others removed the stems. These rope-like plants frequently grow to the incredible length of four or even six hundred feet, often consisting of a couple of hundred joints two or three feet long, and bearing at every knot a feathery leaf, armed with thorns on its lower surface. Though often extremely disagreeable to the traveller, yet they are far from being useless. The natives of Java and the other islands of the Eastern Archipelago cut the cane into fine slips, which they plait into beautiful mats, manufacture into strong and neat baskets, or twist into cordage of such strength and durability that it is even used with success in the formation of bridges across the watercourses and ravines.

On turning from the Indian Ocean to Arabia and Africa, we enter upon a new world of palms, several of which are no less valuable than the cocoa-nut or the palmyra.

The date-tree (*Phœnix dactylifera*), sung from time imme-

morial by the poets of the East, is as indispensable as the camel to the inhabitants of the wastes of North Africa and Arabia, and, next to the 'ship of the desert,' the devout Mussulman esteems it the chief gift of Allah. Few palms have a wider range, for it extends from the Persian Gulf to the borders of the Atlantic, and flourishes from the twelfth to the thirty-seventh degree of northern latitude. Groves of dates adorn the coasts of Valencia in Spain; near Genoa its plantations afford leaves for the celebration of Palm Sunday; and in the gardens of southern France a date-tree is sometimes seen growing among the oranges and olives. But it never bears fruit on these northern limits of its empire, and thrives best in the oases on the borders of the sandy desert.

The date-palm is propagated by shoots, and the female tree bears its first fruits after four or five years. It is said to attain to an age of two centuries, but is rarely left standing longer than eighty years, when the trunk is tapped in spring, producing a kind

of toddy, which is consumed in great quantities in 'Biledulgerid,' or the long line of oases situated to the south of the Atlas, and pre-eminently called the 'land of dates.'

It is not to be wondered at that the tribes of the desert so highly value a tree which, when in full growth, bears as much as two hundredweight of dates, and by enabling a family to live on the produce of a small spot of ground, extends as it were the bounds of the green islands of the desert. It is considered criminal to fell it while still in its vigour, and both the Bible and the Koran forbid the warriors of the true God to apply the axe to the date-trees of an enemy.



DATE TREE.

In Arabia the date palms of El Medinah are celebrated above all others for the excellence of their fruit, which were the favourite food of the Prophet—a circumstance investing them in the eyes of all true believers with a certain degree of sanctity. Their stately columnar stems here seem higher than in other lands, and their lower fronds, which in Egypt are lopped off about Christmas time to increase the flavour of the fruit, are allowed to remain unmutilated. One of the reasons for the excellence of Medinah dates is the quantity of water they obtain. Each garden or field has its well; and, even in the hottest weather, the water-wheel floods the soil every third day. The date-tree can live in dry and barren spots; but it loves the beds of streams, and places where moisture is procurable. Books enumerate 139 varieties of date trees. Of these between sixty and seventy are well known, and each is distinguished as usual, among Arabs, by its peculiar name.

The best kind, El Shelebi, is packed in skins or in flat round boxes covered with paper, and sent as gifts to the remotest parts of the Moslem world, for the pilgrim to the Holy Cities would be badly received by the women of his family if he did not present them on his return with a few boxes of this fruit. Imagination has also done its best to invest the better kinds of dates with a legendary interest. Thus, the Ajwah is eaten but not sold, because a tradition of the Prophet declares that whoso breaketh his fast every day with six or seven of the Ajwah date need fear neither poison nor magic. The third kind, El Hilwah, also a large date, derives its name from its exceeding sweetness. Of this tree the Moslems relate that the Prophet planted a stone, which in a few minutes grew up and bore fruit. The Wahski on one occasion bent its head and salaamed to Mahomet as he eat its fruit, for which reason even now its lofty tuft turns earthwards. The Sayhani is so called because, when the founder of El Islam, holding Ali's hand, happened to pass beneath it, it cried, 'This is Mahomet the Prince of the Prophets, and this is Ali the Prince of the Pious.' Of course the descendants of this intelligent tree hold a high rank in the kingdom of palms.

The citizens of Medinah delight in speaking of dates as an Irishman does of potatoes—with a kind of familiar fondness: they eat them for medicine as well as food. The fruit is ripe

about the middle of May, and the gathering of it forms the Arab's vintage. The people make merry the more readily because their favourite fruit is liable to a variety of accidents; droughts injure the tree, locusts destroy the produce, and thus the date crop, like most productions which men are imprudent enough to adopt singly as the staff of life, is subject to failure.

Towards the equator the date-tree disappears, while the Doum (*Hyphæne thebaica*), distinguished from most other



OIL PALM.

palms by its branching trunk, each branch being surmounted by a tuft of large stiff flabelliform leaves, assumes a conspicuous place in the landscape. Its fruits, which are of the size of a small apple, and covered with a tough yellow lustrous rind, have a sugary taste, and serve for the preparation of sherbet. The old leaf-stalks with their thorns and sheathes, which remain attached to the trunk, render the task of climbing it next to impossible. The chief seat of this beautiful palm are the banks

of the Nile, in the region of the cataracts. In Kordofan the Delebl palms form large clumps with tamarinds, cassias, adansonias, and various mimosas. Straight as an arrow and perfectly smooth-rinded, this magnificent tree rises to the height of a hundred feet, bearing large fan-like leaves, attached to foot-stalks ten feet long, and armed with mighty thorns. From ten to twenty large bunches of nuts, as big as a man's head, hang beneath the fronds, but unfortunately these fine-looking fruits disappoint the taste.

Thus various forms of palms flourish along the banks of the Nile, but in general Africa has a smaller variety of these trees to boast of than either Asia or America. On the other hand, the forests of Brazil have no palms at all comparable in commercial importance to the *Cocos butyracea* and the *Elæis gumeensis*, the oil-teeming fruit trees of tropical West Africa. The productiveness of the *Elæis* may be inferred from its bearing clusters of from 600 to 800 nuts, larger than a pigeon's egg, and so full of oil that it may be pressed out with the fingers. As long as the slave trade reigned along the coast of Guinea, these vegetable treasures remained unnoticed; but since England began to raise her voice against this infamous traffic, they have become the object of an immense and constantly increasing commerce.

The American palms are pre-eminent in beauty, and many of them rank highly in the list of useful plants.

The leaves of the *Carnauba* (*Corypha cerifera*) furnish an abundance of wax. The lowlands of Guiana, between 3° and 7° N. lat., are frequently covered with this social fan-palm, whose full-grown fronds, when cut and dried in the shade, cover themselves with light-coloured scales. These melt in a warmth of 206° F., and then form a straw-coloured liquid, which again concretes on cooling. It burns with as clear and bright a flame as the best bees'-wax, and will no doubt become a considerable article of trade, when once the spirit of industry awakens in those rich but thinly-populated regions. Like many other palms, the *Carnauba* does not confine her gifts to one single product. The boiled fruit is edible, and the pith of the young stems affords a nutritious fecula. Roofs thatched with its leaves resist for many years the effects of the weather, and its wood may be used for a variety of purposes.

A kind of wax, exuding from the rings of its trunk, is also produced by the beautiful *Ceroxylon andicola*, which grows on the slopes of the Andes, up to an elevation of eight thousand feet. Even the lofty vault of the Crystal Palace would be unable to span this majestic palm, which, according to Humboldt's accurate measurement, towers one hundred and eighty feet above the ground, and bears a tuft of fronds each twenty-four feet long.

The cabbage-palm of the Antilles (*Oreodoxa oleracea*) almost rivals the mountain *Ceroxylon* in magnificence of growth, as its stem, which near to its base is about seven feet in circumference, ascends straight and tapering to the height of 130 feet. Its lofty fronds, moved by the gentlest breeze, are an object of beauty which can hardly be conceived by those who are unused to the magnificent vegetation of a tropical sun. Within the leaves which surround the top of the trunk, the cabbage, composed of longitudinal flakes, like ribands, but so compact as to form a crisp and solid body, lies concealed. It is white, about two or three feet long, as thick as a man's arm, and perfectly cylindrical. When eaten raw, it resembles the almond in flavour, but is more tender and delicious. It is usually cut into pieces, boiled, and served as an auxiliary vegetable with meat. To obtain this small portion, borne on the pinnacle of the tree, and hidden from the eye of man, the axe is applied to the stately trunk, and its towering pride laid low.

Besides its cabbage, the *Oreodoxa* furnishes another great delicacy to the table. After the removal of the heart, a kind of black-beetle deposits its egg in the cavity, from which fat grubs are developed, growing to the size and thickness of a man's thumb. These, though disgusting in appearance, when fried in a pan, with a very little butter and salt, have a taste which savours of all the spices of India.

Both the *Oreodoxa* and the *Ceroxylon* are far surpassed in height by the Californian firs and the Eucalypti of Australia, but no other trees rise so proudly in the air on shafts comparatively so slender. While the enormous trunks of the Sequoias and Wellingtonias remind one of the massy pillars of our old gothic churches, the graceful palms recall to our memory the slender Ionic or Corinthian columns which adorn the masterpieces of Grecian architecture.

The oil of the Corozo (*Elæis oleifera*) is usually burnt in the

houses and churches of Carthage and New Granada ; and the *Oenocarpus disticha* is cultivated in Brazil, as it furnishes an excellent oil for culinary purposes. The Pirijao (*Gulielma speciosa*) is planted round the huts of the Indians, and replaces in some districts the Mauritia as the tree of life. The Piaçava (*Attalia funifera*), whose stone-hard dark-brown nuts are manufactured into rosaries by the inhabitants of Villa Nova de Olivença, is far more important, on account of its fibres, which, unknown a few years ago, are now imported into England in large quantities, where they serve for making brooms ; and the amazingly hard nuts of the Cabeza di Negro (*Phytelphas*), rivalling ivory in whiteness, solidity, and beauty, are extensively used by our turners for similar purposes.

Though no trees are more characteristic of the tropics than the palms, yet specimens are found far within the temperate regions. Along with the date-tree the *Chamærops humilis* graces the environs of Nizza, and the *Areca sapida* flourishes in the mild insular climate of New Zealand (38° S. lat.). In Africa, the *Hyphæne coriacea* grows at Port Natal (30° S. lat.), and in America the palms extend to 35° S. lat., both in the Pampas of Buenos Ayres, and in Chili, where the Choco indicates the extreme limits of the family.

As these species are able to exist under a mean annual temperature of 58°, they might possibly be made to adorn the gardens of Penzance ; most palms, however, require a mean temperature of from 70° to 72°, and on advancing towards the equator increase in beauty, stateliness of growth, and variety of form. Their chief seats are the lower regions of the torrid zone ; but as some species range far to the north or south, thus others ascend the mountain-slopes, almost to the limits of perpetual snow.

In South America, the *Ceroxylon andicola* and the *Kunthia montana* are found growing at an altitude of 6,000 and 9,000 feet, and in the Paramo de Guanacos, Humboldt even saw palms 13,000 feet above the level of the sea.

Besides the height of the shaft, the position of the leaves serves chiefly to impart a more or less majestic character to the palms : those with drooping leaves being far less stately than those whose fronds shoot more or less upwards to the skies. Nothing can exceed the elegance of the Jagua palm, which along with the

splendid Cucurito adorns the granite rocks in the rapids of the Orinoco at Atures. The fronds, which are but few in number, rise almost perpendicularly sixteen feet high, from the top of the lofty columnar shaft, and their feathery leaflets of a thin and grass-like texture play lightly round the tall leaf-stalks, slowly bending in the breeze. In the palms with a feathery foliage, the leaf-stalks rise either immediately from a brown ligneous trunk (cocoa-nut, date), or, as in the beautiful Palma Real of the Havana, from a smooth, slender, and grass-green shaft, placed like an additional column upon the dark-coloured trunk. In the fan-palms, the crown frequently rests upon a layer of dried leaves, which impart a severe character to the tree.

The form of the trunk also varies greatly; sometimes it is extremely short, as in *Chamærops humilis*; and sometimes, as in the ratans, assumes a bush-rope appearance. In some species it is smooth and unarmed, in others rugged or bristling with spines. In the American Yriartea it rests upon a number of roots rising above the ground. Thus the *Y. exorrhiza*, frequently stands upon a dozen or more supports, embracing a circumference of twenty feet; and the *Y. ventricosa* is still more curious, as the spindle-shaped trunk, which at both ends is scarce a foot thick, swells in the middle to a threefold diameter, and, from its convenient form, is frequently used by the Indians for the construction of their canoes.



YRIARTEA VENTRICOSA.

The form and colour of the fruits is also extremely various. What a difference between the large double nuts of the *Lo-doicea* and the date—between the egg-shaped fruits of the *Mauritia*, whose scaly rind gives them the appearance of fir-cones, and the gold and purple peaches of the *Pirijao*, hanging in colossal clusters of sixty or eighty from the summit of the majestic trunk.

The family of the ferns is spread over the whole earth, but chiefly abounds in the vicinity of the tropics. Most of these plants love the shady and damp ground of the primitive forest,

others attach themselves with their roots to rocks or trees. In the equatorial regions several of their species attain arboreal dimensions, with stems from twelve to thirty feet high and extensive crowns of large fronds, imitating the stately tufts of palms. But they do not possess the noble elegance of these kings of the vegetable world; and their stems, of a sombre brown colour, are rather an image of decrepid old age than of the youthful vigour which we admire in the growth of the palms. They do not seem to love the highest temperature of the equator, but rather the milder climate of the mountainous regions near the tropics. Here they frequently stand singly in the thicket, particularly where a waterfall impregnates the air with moisture, or on the borders of sources and ponds. No parasites settle upon them, no bird constructs its nest among their fronds, no quadrupèd burrows in the mouldy ground where they take root, even the ants disdain to build on their sapless stems, and thus they make the impression of friendless aliens in a convivial group.



ARECA PALM.



THE BANANA AND THE PLANTAIN.

## CHAPTER XIV.

### THE CHIEF ESCULENT PLANTS OF THE TORRID ZONE.

Rice—Various Aspect of the Rice-fields at different Seasons—The Rice-Bird—Maize—First imported from America by Columbus—Its enormous Productiveness—Its wide zone of Cultivation—Millet, Dhourra—The Bread-Fruit Tree—The Bananas—Their ancient Cultivation—Avaca or Manilla Hemp—Humboldt's Remarks on the Banana—The Traveller's Tree of Madagascar—The Cassava Root—Tapioca—Yams—Batatas—Arrowroot—Taro—Tropical Fruit Trees—The Chirimoya—The Litchi—The Mangosteen—The Mango.

OF all the cereals there is none that affords food to so vast a multitude as the rice-plant (*Oryza sativa*), on whose grains from time immemorial the countless millions of south-eastern Asia chiefly subsist. From its primitive seat, on the Ganges or the Sikiang, its cultivation has gradually spread not only over the whole tropical zone, but even far beyond its bounds, as it thrives both in the swamps of South Carolina and in the rich alluvial plains of the Danube and the Po.

Along the low river banks, in the delta-lands which the rains of the tropics annually change into a boundless lake, or where, by artificial embankments, the waters of the mountain streams have been collected into tanks for irrigation, the rice-plant

attains its utmost luxuriance of growth, and but rarely deceives the hopes of the husbandmen.

The aspect of the lowland rice-fields of India and its isles is very different at various seasons of the year. Where, in Java, for instance, you see to-day long-legged herons gravely stalking over the inundated plain partitioned by small dykes, or a yoke of indolent buffaloes slowly wading through the mud, you will three or four months later be charmed by the view of a gracefully undulating corn-field, bearing a great resemblance to our indigenous barley. Cords, to which scare-crows are attached traverse the field in every direction, and converge, to a small watch-house, erected on high poles. Here the attentive villager sits, like a spider in the centre of its web, and by pulling the cords, puts them from time to time into motion, whenever the wind is unwilling to undertake the office. Then the grotesque and noisy figures begin to rustle and to caper, and whole flocks of the neat little rice-bird or Java sparrow (*Loxia oryzivora*), rise on the wing, and hurry off with all the haste of guilty fright. After another month has elapsed, and the waters have



JAVA SPARROW.

long since evaporated or been withdrawn, the harvest takes place, and the rice-fields are enlivened by a motley crowd, for all the villagers, old and young, are busy reaping the golden ears.

The rice-fields offer a peculiarly charming picture when, as in the mountain valleys of Ceylon, they rise in terraces along the slopes. 'Selecting an angular recess where two hills converge, the Kandians construct a series of terraces, raised stage above stage, and retiring as they ascend along the slope of the acclivity, up which they are carried as high as the soil extends. Each terrace is furnished with a low ledge in front, behind which the requisite depth of water is retained during the germination of the seed, and what is superfluous is permitted to trickle down to the one below it. In order to carry on this peculiar cultivation the streams are led along the level of the hills, often from a distance of many miles, with a skill and perseverance for which the natives of these mountains have attained a great renown.'

Maize is no less important to the rapidly-growing nations of America than the rice-plant to the followers of Buddha or of Brama. The time when the cereals of the old world were first transplanted from their unknown Asiatic homes is, and ever will be, hidden in legendary obscurity; but the epoch when maize was for the first time seen and tasted by Europeans lies before us in the broad daylight of authentic history. For, when Columbus discovered Cuba, in the year 1492, he found maize cultivated by the Indians, and was equally pleased with the taste of the roasted grains and astonished at their size. In the following year, when he made his triumphant entry into Barcelona, and presented his royal patrons—Ferdinand and Isabella—with specimens of the various productions of the New World, the maize-spikes he laid down before their throne, though but little noticed, were in reality of far greater importance than the heaps of gold which were so falsely deemed to be the richest prizes of his grand discovery. In this manner maize was first conveyed from the New World to Spain, whence its cultivation gradually extended over the tropical and temperate zones of the eastern hemisphere. Round the whole basin of the Mediterranean, maize has found a new home, and its grain now nourishes the Lombard and the Hungarian, as it does the Egyptian fellah or the Syrian peasant.

While our northern cereals only produce a pleasing effect when covering extensive fields, but are individually too insignificant to claim attention, the maize-plant almost reminds the spectator of the lofty *Bambusaceæ* of the tropical world. Even in our gardens it rises above a man's height, and in warmer countries not seldom attains the gigantic stature of fourteen feet. Ensiform, dark green, lustrous leaves, somewhat resembling those of the large oarweeds of the northern seas, spring alternately from every joint of this cereal, streaming like pennants and sharply rustling in the wind. The top produces a bunch of male flowers of various colours, which is called the *tassel*. Each plant likewise bears three or more spikes or ears, proceeding from the stem, at various distances from the ground, and closely enveloped by several thin leaves, forming a sheath, or *husk*. They consist of a cylindrical substance of the nature of pith, which is called the *cobb*, and over the entire surface of which the seeds are ranged and fixed, in eight

or more straight rows. Each of these has generally as many as thirty or more seeds, and each seed weighs at least as much as five or six grains of wheat or barley. Surely a cereal like this deserves beyond all others to symbolise abundance, and, had it been known to the Greeks, it would beyond all doubt have figured conspicuously in the teeming horn of Amalthea.

In light sandy soils, under the scorching rays of the sun, and in situations where sufficient moisture cannot be obtained for the production of rice, numerous varieties of millet (*Sorghum vulgare*) are successfully cultivated in many tropical countries—in India, Arabia, the West Indies, in Central Africa, and in Nubia, where it is grown almost to the exclusion of every other esculent plant. Though the seeds are by much the smallest of any of the cereal plants, the number borne upon each stalk is so great as to counterbalance this disadvantage, and to render the cultivation of millet as productive as that of any other grain.

The bread-fruit tree is the great gift of Providence to the fairest isles of Polynesia. No fruit or forest tree in the north of Europe, with the exception of the oak or linden, is its equal in regularity of growth and comeliness of shape; it far surpasses the wild chestnut, which somewhat resembles it in appearance. Its large oblong leaves are deeply lobed like those of the fig-tree, which they resemble not only in colour and consistence, but also in exuding a milky juice when broken. About the time when the sun, advancing towards the Tropic of Capricorn, announces to the Tahitians that summer is approaching, it begins to produce new leaves and young fruits, which commence ripening in October, and may be plucked about eight months long in luxuriant succession. The fruit is about the size and shape of a new-born infant's head, with a thin skin, and a core about as big as the handle of a small knife. The edible part, which lies between the skin and the core, and is as white as snow, must be roasted before it is eaten; its taste is insipid, with a slight sweetness, somewhat resembling that of the crumb of wheaten bread mixed with boiled potatoes. When the season draws to an end, the last fruits are laid in heaps, and closely covered with leaves. In this state they undergo a fermentation and become disagreeably sweet; the core is then taken out entire, which is done by gently pulling out the stalk, and the

rest of the fruit is thrown into a hole, where it undergoes a second fermentation, and becomes sour, after which it will suffer no change for many months. It is taken out of the hole as it is wanted for use, and, being made into balls, it is wrapped up in leaves and baked.

To procure this principal article of their food costs the fortunate South Sea Islanders no more trouble than plucking and preparing it in the manner above described; for, though the tree which produces it does not grow spontaneously, yet, if a man plants but ten of them in his lifetime, which he may do in about an hour, he will, as Cook remarks, 'as completely fulfil his duty to his own and future generations, as the native of our less genial climate by ploughing in the cold of winter and reaping in the summer's heat as often as the seasons return.'

Dampier (1688) is the first English writer that mentions the bread-fruit tree, which he found growing in the Ladrões, and a few years later Lord Anson enjoyed its fruits at Tinian, where they contributed to save the lives of his emaciated and scurvy-stricken followers. It continued, however, to remain unnoticed in Europe, until the voyages of Wallis and Cook attracted the attention of the whole civilized world to the fortunate islands, whose inhabitants, instead of gaining their bread by the sweat of their brow, plucked it ready formed from the teeming branches of their groves.

But the wonderful luxuriance of tropical vegetation is perhaps nowhere more conspicuous and surprising than in the magnificent Musaceæ, the banana (*Musa sapientum*), and the plantain (*Musa paradisiaca*), whose fruits most probably nourished mankind long before the gifts of Ceres became known. A succulent shaft or stem, rising to the height of fifteen or twenty feet, and frequently two feet in diameter, is formed of the sheath-like leaf-stalks rolled one over the other, and terminating in enormous light-green and glossy blades, ten feet long and two feet broad, of so delicate a tissue that the slightest wind suffices to tear them transversely as far as the middle rib. A stout foot-stalk arising from the centre of the leaves, and reclining over one side of the trunk, supports numerous clusters of flowers, and subsequently a great weight of several hundred fruits about the size and shape of full-grown

cucumbers. On seeing the stately plant, one might suppose that many years had been required for its growth; and yet only eight or ten months were necessary for its full development.

Each shaft produces its fruit but once, when it withers and dies; but new shoots spring forth from the root, and, before the year has elapsed, unfold themselves with the same luxuriance. Thus, without any other labour than now and then weeding the field, fruit follows upon fruit, and harvest upon harvest. A single bunch of bananas often weighs from sixty to seventy pounds, and Humboldt has calculated that thirty-three pounds of wheat and ninety-nine pounds of potatoes, require the same space of ground to grow upon as will produce 4,000 pounds of bananas.

This prodigality of Nature, seemingly so favourable to the human race, is however attended with great disadvantages; for where the life of man is rendered too easy, his best powers remain dormant, and he almost sinks to the level of the plant which affords him subsistence without labour. Exertion awakens our faculties as it increases our enjoyments, and well may we rejoice that wheat and not the banana ripens in our fields.

As the seeds of the cultivated plantain and banana never or very rarely come to maturity, they can only be propagated by suckers. 'In both hemispheres,' says Humboldt, 'as far as tradition or history reaches, we find plantains cultivated in the tropical zone. It is as certain that African slaves have introduced, in the course of centuries, varieties of the banana into America, as that before the discovery of Columbus the plantain was cultivated by the aboriginal Indians.'

'These plants are the ornaments of humid countries. Like the farinaceous cereals of the north, they accompany man from the first infancy of his civilisation. Semitical traditions place their original home on the banks of the Euphrates; others, with greater probability, at the foot of the Himalayas. According to the Greek mythology, the plains of Enna were the fortunate birthplace of the cereals; but while the monotonous fields of the latter add but little to the beauty of the northern regions, the tropical husbandman multiplies in the banana one of the noblest forms of vegetable life.'

The Musacææ are not only useful to man by their mealy, wholesome, and agreeable fruits, but also by the fibres of their long leaf-stalks. Some species furnish filaments for the finest muslin, and the coarse fibres of the *Musa textilis*, known in trade under the name of Manilla hemp, serve for the preparation of very durable cordage.

To the same family of plants belongs also the traveller-tree of Madagascar (*Ravenala speciosa*), one of those wonderful sources of refreshment which Nature has provided for the thirsty wanderer in the wilderness. The foot-stalks of the elliptical, alternate leaves embrace the trunk with broad sheathes, in which the dew trickling from their surface is collected. Thus the ravenala, the hollow baobab, the pitcher-plant, and the juicy cactuses, all answer a similar purpose, and it is impossible to say which of them is most to be admired.

Life and death are strangely blended in the Cassava or Mandioca root (*Jatropha Manihot*); the juice a rapidly destructive poison, the meal a nutritious and agreeable food, which, in tropical America, and chiefly in Brazil, forms a great part of the people's sustenance. The height to which the cassava attains varies from four to six feet: it rises by a slender, woody, knotted stalk, furnished with alternate palmated leaves, and springs from a woody root, the slender collateral fibres of which swell into those farinaceous parsnip-like masses, for which alone the plant is cultivated. It requires a dry soil, and is not found at a greater elevation than 2,000 feet above the level of the sea. It is propagated by cuttings, which very quickly take root, and in about eight months from the time of their being planted, the tubers will generally be in a fit state to be collected; they may, however, be left in the ground for many months without sustaining any injury. The usual mode of preparing the cassava is to grind the roots after peeling off the dark-coloured rind, to draw out the poisonous juice, and finally to bake the meal into thin cakes on a hot iron hearth. Fortunately the deleterious principle is so volatile as to be entirely dissipated by exposure to heat; for when the root has been cut into small pieces, and exposed during some hours to the direct rays of the sun, cattle may be fed on it with perfect safety. If the recently extracted juice be drunk by cattle or poultry, the animals soon die in convulsions; but if this same

liquid is boiled with meat and seasoned, it forms a wholesome and nutritious soup. The *Jatropha Janipha*, or Sweet Cassava, though very similar to the *Manihot* or bitter variety, and wholly innocuous, is far less extensively cultivated.

The yam-roots, so frequently mentioned in narratives of travel through the tropical regions, are the produce of two climbing plants—the *Dioscorea sativa* and *alata*—with tender stems of from eighteen to twenty feet in length, and smooth sharp-pointed leaves on long foot-stalks, from the base of which arise spikes of small flowers. The roots of the *D. sativa* are flat and palmated, about a foot in breadth, white within and externally of a dark brown colour, those of the *D. alata*, are still larger, being frequently about three feet long, and weighing about thirty pounds. Both kinds are cultivated like the common potato, which they resemble in taste, though of a closer texture.

The *Dioscoreæ* are natives of South Asia, and are supposed to have been thence transplanted to the West Indies, as they have never been found growing wild in any part of America; while in the island of Ceylon, and on the coast of Malabar, they flourish in the woods with spontaneous and luxurious growth.

The Spanish or Sweet Potato (*Convolvulus Batatas*), commonly cultivated in the tropical climates both of the eastern and the western hemispheres, is an herbaceous perennial, which sends out many trailing stalks, extending six or eight feet every way, and putting forth at each joint roots which in a genial climate grow to be very large tubers, so that from a single plant forty or fifty large roots are produced. The leaves are angular and stand on long petioles, the flowers are purple. The batata is propagated by laying down the young shoots in the spring; indeed in its native climate it multiplies almost spontaneously, for if the branches of roots that have been pulled up are suffered to remain on the ground, and a shower of rain falls soon after, their vegetation will recommence.

Arrowroot is chiefly obtained from two different plants—the *Marantha arundinacea* and the *Tacca pinnatifida*. The former a native of South America, is an herbaceous perennial and is propagated by parting the roots. It rises to the height of two or three feet, has broad pointed leaves, and is crowned by a spike of small white flowers. It is much cultivated, both for

domestic use and for exportation in the West Indies, and in some parts of Hindostan. The arrowroot is obtained by first pounding the long stalky roots in a large wooden mortar, and pouring a quantity of water over them. After the whole has been agitated for some time, the starch, separated from the fibres, collects at the bottom of the vessel, and, having been cleansed by repeated washing, is dried in the sun.

The *Tacca pinnatifida*, likewise an herbaceous plant with pinnated leaves, an umbelliform blossom, and large potato-like roots, is scattered over most of the South Sea Islands. It is not cultivated in the Hawaiian group, but found growing wild in abundance in the more elevated districts, where it is satisfied with the most meagre soil, and sprouts forth among the lava blocks of those volcanic islands. Arrowroot is prepared from this plant in the same manner as from the West Indian *Marantha*, but, as the improvident Polynesians only think of digging it out of the earth, and never give themselves the trouble of replanting the small and useless tubers, its quantity has very much diminished.

The *Caladium esculentum*, an aquatic plant, furnishes the large Taro roots which, boiled to a thick paste, form the chief food of the Sandwich Islanders, and are extensively cultivated in many other groups of the South Seas. It grows like rice on a marshy ground, the large sagittated leaves rise on high foot-stalks, immediately springing from the root, and are likewise very agreeable to the taste, but are more seldom eaten, as they are used for propagation. Severed from the root, they merely require to be planted in the mud to produce after six months a new harvest of roots. The growth is so abundant that 1,500 persons can live upon the produce of a single square mile, so that supposing the United Kingdom to be one vast taro-field, its surface would be able to nourish about two thousand millions of souls.

As there is a mountain-rice which thrives without artificial irrigation, there is also a mountain-taro (*Caladium cristatum*), which resembles the former in general appearance, but prefers a more dry and elevated soil. Although the plant grows wild both in the Society and Marquesas Islands, yet Pitcairn's Island was the only spot where Mr. Bennett saw it cultivated.

But the possession of a plant which furnishes so much food

with so little labour, can hardly be considered as a benefit for the Sandwich Islanders, whose natural indolence is too much encouraged by the abundance it creates. The Hawaiian constantly sees before his eyes the coffee-groves and sugar-plantations, the cotton and indigo fields, which, cultivated by Chinese coolies, amply reward the enterprise of the European and American settlers in his native land, and yet he saunters by, too indolent even to stretch out his hand and gather the berries from the trees.

It may easily be imagined that the tropical sun, which distils so many costly juices and fiery spices in indescribable multiplicity and abundance, must also produce a variety of fruits. But man has as yet done but little to improve by care and art these gifts of Nature, and, with rare exceptions, the delicious flavour for which our native fruits are indebted to centuries of cultivation, is found wanting in those of the torrid zone. In our gardens Pomona appears in the refined garb of civilisation, while in the tropics she still shows herself as a savage beauty, requiring the aid of culture for the full development of her attractions.

Yet there are exceptions to the rule, and among others the Peruvian Chirimoya (*Anona tripetala*) is vaunted by travellers in such terms of admiration that it can hardly be inferior to and probably surpasses, the most exquisite fruits of European growth. Hänke calls it, in one of his letters, a masterpiece of Nature, and Tschudi says that its taste is quite incomparable. It grows to perfection at Huanuco, where it attains a weight of from fourteen to sixteen pounds. The fruit is generally heart-shaped, with the broad base attached to the branch. The rind is green, covered with small tubercles and scales, and encloses a snow-white, juicy pulp, with many black kernels. Both the fruit and the blossoms exhale a delightful odour. The tree is about twenty feet high, and has a broad dull green crown.

In the eastern hemisphere, the litchi, the mangosteen, and the mango enjoy the highest reputation.

The Litchi (*Nephelium Litchi*), a small insignificant tree, with lanceolate leaves, and small greenish-white flowers, is a native of China and Cochin-China, but its cultivation has spread over the East and the West Indies. The plum-like scarlet fruit is generally eaten by the Chinese to their tea, but it is

also dried in ovens and exported. In order to obtain the fruit in perfection, for the use of the Imperial Court, the trees, as soon as they blossom, are conveyed from Canton to Peking on rafts, at a very great trouble and expense, so that the plums may just be ripe on their arrival in the northern capital.

The beautiful Mangosteen (*Garcinia Mangostana*), a native of the Moluccas, and thence transplanted to Java, Siam, the Philippines, and Ceylon, resembles at a distance the citron-tree, and bears large flowers like roses. The dark brown capsular fruit, about the size of a small apple, is described as of unequalled flavour—juicy and aromatic, like a mixture of strawberries, raspberries, grapes, and oranges. It is said that the patient who has lost an appetite for everything else still relishes the mangosteen, and that the case is perfectly hopeless when he refuses even this.

The stately Mango (*Mangifera indica*) bears beautiful girandoles of flowers, followed by large plum-like fruits, of which, however, but four or five ripen on each branch. More than forty varieties are grown at Kew, the finest of which are reserved for the Queen's table. From Ceylon, its original seat, the mango has been transplanted far and wide over the torrid zone.



MANGOSTEEN.



THE SUGAR CANE.

## CHAPTER XV.

### SUGAR, COFFEE, CACAO, COCA.

Progress of the Sugar Cane throughout the Tropical Zone—The Tahitian Sugar Cane—The enemies of the Sugar Cane—The Sugar-harvest—The Coffee Tree—Its cultivation and enemies—The Cacao Tree and the Vanilla—The Coca Plant—Wonderful strengthening Effects of Coca, and fatal consequences of its Abuse.

**S**UGAR is undoubtedly one of the most valuable products of the vegetable world, and may be said with truth to be only surpassed in importance by the nourishing meal of the cereals, or the textile fibres of the cotton-plant. Our garden fruit owes its agreeable taste to the sugar which the ripening sun develops in its juices. The sap of many a plant—the palm, the birch, the maple, the American agave—is rendered useful to man by

the sugar it contains. It is this substance which imparts sweetness to the honey gathered by bees from flowers, and, after undergoing fermentation, changes the juice of the grape into delicious wine.

But although sugar is of almost universal occurrence throughout the vegetable world, yet few plants contain it in such abundance as to render its extraction profitable; and even the beet-root requires high protective duties to be able to compete with the tropical sugar-cane, a member of the extensive family of the grasses. The original home of this plant—for which, doubtless, the lively fancy of the ancient Greeks, had they been better acquainted with it, would have invented a peculiar god, as for the vine or the cereals—was most probably south-eastern Asia, where the Chinese seem to have been the first people that learnt the art to multiply it by culture.

From China its cultivation spread westwards to India and Arabia, and the conquests of Alexander the Great, first made Europe acquainted with the sweet-juiced cane, while sugar itself had long before been imported by the Phœnicians as a rare production of the Eastern world.

During the dark ages which followed the fall of the Roman Empire, all previous knowledge of the Oriental sugar-plant became lost, until the Crusades, and, still more, the revival of commerce in Venice and Genoa re-opened the ancient intercourse between the Eastern and the Western world. From Egypt, where the cultivation of the sugar-cane had meanwhile been introduced, it now extended to the Morea, to Rhodes, and Malta; and at the beginning of the twelfth century we find it growing in Italy, on the sultry plains at the foot of Mount Etna.

After the discovery of Madeira by the Portuguese, in the year 1419, the first colonists added the vine of Cyprus and the Sicilian sugar-cane to the indigenous productions of that lovely island; and both succeeded so well as to become, after a few years, the objects of a lively trade with the mother country.

Yet, in spite of this extension of its culture, the importance of sugar as an article of international trade continued to be very limited, until the discovery of *tropical* America \* by Columbus

\* The northern part of the new continent had been visited and colonized centuries before by the mariners of Iceland. For an account of this discovery, see 'The Sea and its Living Wonders,' second edition, p. 362.

opened a new world to commerce. As early as the year 1506 the sugar-cane was transplanted from the Canary Islands to Hispaniola, where its culture, favoured by the fertility of a virgin soil and the heat of a tropical sun, was soon found to be so profitable that it became the chief occupation of the European settlers. The Portuguese, in their turn, conveyed the cane to Brazil; from Hispaniola it spread over the other West Indian Islands; thence wandered to the Spanish main, and followed Pedrarias and Pizarro to the shores of the Pacific. Unfortunately, a dark shade obscures its triumphal march, as its cultivation was the chief cause which entailed the curse of negro slavery on some of the fairest regions of the globe.

Towards the middle of the last century, the Chinese or Oriental sugar-cane had thus multiplied to an amazing extent over both hemispheres, when the introduction of the Tahitian variety, which was found to attain a statelier growth, to contain more sugar, and to ripen in a shorter time, began to dispossess it of its old domains. This new and superior plant is now universally cultivated in all the sugar-growing European colonies; and if Cook's voyages had produced no other benefit than making the world acquainted with the Tahitian sugar-cane, they would for this alone deserve to be reckoned by the political economist among the most successful and important ever performed by man.

The sugar-cane bears a great resemblance to the common reed, but the blossom is different. It has a knotty stalk, frequently rising to the height of fourteen feet, and produces at each joint a long, pointed, and sharply serrated leaf or blade. The joints in one stalk are from forty to sixty in number, and the stalks rising from one root are sometimes very numerous. A field of canes, when agitated by a light breeze, affords one of the most pleasing sights, particularly when, towards the period of their maturity, the golden plants appear crowned with plumes of silvery feathers, delicately fringed with a lilac dye.

The sugar-cane is liable to be destroyed by many enemies. Sometimes herds of monkeys come down from the mountains by night, and having posted sentinels to give the alarm if anything approaches, destroy incredible quantities of the cane by their gambols as well as their greediness. It is in vain to set traps for these creatures, however baited; and the only way to

protect a plantation and destroy them, is to set a numerous watch, well armed with fowling-pieces, and furnished with dogs.

The rat, which the extension of commerce has gradually spread over the world, is still more destructive to the sugar-cane, and great pains are taken to keep it in check by poison or by its arch-enemy the cat.

The sugar-cane is also subject to the *blast*—a disease which no foresight can obviate, and for which human wisdom has hitherto in vain attempted to find a remedy. When this happens, the fine broad green blades become sickly, dry, and withered; soon after they appear stained in spots, and if these are carefully examined, they will be found to contain countless eggs of an insect like a bug, which are soon quickened, and cover the plants with vermin; the juice of the canes thus affected becomes sour, and no future shoot issues from the joints. The ravages of the ants concur with those of the bugs in ruining the prospects of many a sugar-field, and often a long continued drought or the fury of the tornado will destroy the hopes of the planter.

The land crabs are also very injurious to the sugar-fields, some of the species being particularly fond of the cane, the juice of which they suck and chiefly subsist on. They are of course narrowly watched, and no opportunity of catching them is lost sight of; but such is their activity in running, that they are almost always enabled to escape. They seldom go far from their burrows in day-time; and their watchfulness is such that they regain them in a moment, and disappear as soon as a man or dog comes near enough to be seen.

Harvest-time in the sugar-plantations is no less a season of gladness than in the corn-fields of England. So palatable, wholesome, and nourishing is the fresh juice of the cane, that every animal drinking freely of it derives health and vigour from its use. The meagre and sickly among the negroes exhibit a surprising alteration in a few weeks after the mill is set in action. The labouring oxen, horses, and mules, though almost constantly at work during this season, yet being indulged with plenty of the green tops and some of the scummings from the boiling-house, improve more than at any other period of the year. Even the pigs and poultry fatten on the refuse, and enjoy their share of the banquet. The wholesome

effects of the juice of the sugar-cane has not escaped the attention of English physicians, and many a weak-breasted patient, instead of coughing and freezing at home over what is ironically termed a comfortable fireside, now spends his winter in the West Indian Islands, chewing the sweet cane and enjoying in January a genial warmth of seventy-two degrees in the shade.

The mountain regions of Enarea and Caffa, which the reader, on consulting a map of Africa, will find situated to the south of Abyssinia, are most probably the countries where the coffee-tree was first planted by Nature, as it has here not only been



GENERAL FRASER'S COFFEE ESTATE AT RANGBODDE, CEYLON.

cultivated from time immemorial, but is everywhere found growing wild in the forests.

Here also the art of preparing a beverage from its berries seems to have been first discovered. Arabic authors inform us that about four hundred years ago, a learned mufti of Aden, having become acquainted with its virtues on a journey to the opposite shore of Africa, recommended it on his return to the dervises of his convent as an excellent means for keeping awake during their devotional exercises. The example of

these holy men brought coffee into vogue, and its use spreading from tribe to tribe, and from town to town, finally reached Meccah about the end of the fifteenth century. There fanaticism endeavoured to oppose its progress, and in 1511 a council of theologians condemned it as being contrary to the law of Mahomet, on account of its intoxicating like wine, and sentenced the culprit who should be found indulging in his cup of coffee to be led about the town on the back of an ass. The sultan of Egypt, however, who happened to be a great coffee-drinker himself, convoked a new assembly of the learned, who declared its use to be not only innocent but healthy; and thus coffee advanced rapidly from the Red Sea and the Nile to Syria, and from Asia Minor to Constantinople, where the first coffee-house was opened in 1554, and soon called forth a number of rival establishments. But here also the zealots began to murmur at the mosques being neglected for the attractions of the ungodly coffee divans, and declaimed against it from the Koran, which positively says that *coal* is not of the number of things created by God for good. Accordingly the mufti ordered the coffee-houses to be closed; but his successor declaring coffee not to be *coal*, unless when over-roasted, they were allowed to re-open, and ever since the most pious mussulman drinks his coffee without any scruples of conscience. The commercial intercourse with the Levant could not fail to make Europe acquainted with this new source of enjoyment. In 1652, Pasquia, a Greek, opened the first coffee-house in London, and twenty years later the first French cafés were established in Paris and Marseilles.

As the demand for coffee continually increased, the small province of Yemen, the only country which at that time supplied the market, could no longer produce a sufficient quantity, and the high price of the article naturally prompted the European governments to introduce the cultivation of so valuable a plant into their colonies. The islands of Mauritius and Bourbon took the lead in 1718, and Batavia followed in 1723. Some years before, a few plants had been sent to Amsterdam, one of which found its way to Marly, where it was multiplied by seeds. Captain Descleux, a French naval officer, took some of these young coffee-plants with him to Martinique, desirous of adding a new source of wealth to the resources of the colony. The

passage was very tedious and stormy ; water began to fail, and all the gods seemed to conspire against the introduction of the coffee-tree into the New World. But Descleux patiently endured the extremity of thirst that his tender shoots might not droop for want of water, and succeeded in safely bringing over one single plant, the parent stock whence all the vast coffee-plantations of America are said to have derived their origin.

On examining the present state of coffee-production throughout the world, we find that the European markets obtain their chief supplies from Brazil, Java, Ceylon, and the West Indies; but with regard to quality, Mocha coffee, though comparatively insignificant in point of quantity, is still prominent in flavour and aroma.

When left to the free growth of nature, the coffee-tree attains a height of from fifteen to twenty feet ; in the plantations, however, the tops are generally cut off in order to promote the growth of the lower branches, and to facilitate the gathering of the crop. Its leaves are opposite, evergreen, and not unlike those of the bay-tree ; its blossoms are white, sitting on short footstalks, and resembling the flower of the jasmine. The fruit which succeeds is a green berry, ripening into red, of the size and form of a large cherry, and having a pale, insipid, and somewhat glutinous pulp, enclosing two hard and oval seeds or beans, which are too well known to require any further description.

The seeds are known to be ripe when the berries assume a dark red colour, and if not then gathered, will drop from the trees.

To be cultivated to advantage, the coffee-tree requires a climate where the mean temperature of the year amounts to 68°, and where the thermometer never falls below 55°. It is by nature a forest tree requiring shade and moisture, and thus it is necessary to screen it from the scorching rays of the sun by planting rows of umbrageous trees at certain intervals throughout the field. These also serve to protect it from the sharp winds which would injure the blossoms. It cannot bear either excessive heat or a long-continued drought, and where rain does not fall in sufficient quantity, artificial irrigation must supply it with the necessary moisture.

In Java the zone of the coffee-plantations extends between 3,000 and 4,000 feet above the level of the sea ; and the primitive forest is constantly receding before them. Frequently, on felling the woods, a part of the original trees is left standing to shade the tender coffee-plants ; but oftener the rows are made to alternate with those of the sheltering dadab. Thus a new and luxuriant grove replaces the old thicket of nature's planting. Straight paths, kept carefully clean, lead through the dense, dark green shrubbery, under whose thick cover the wild cock hastily retreats when surprised by the wanderer. When the trees are in flower, the branches seem to bend under a weight of snow, from the number of dazzling white blossoms, which form a pleasing contrast to the dark and lustrous foliage, while high above, the dadabs extend their airy crowns, whose light green leaves are agreeably interspersed with flowers of a brilliant red. A few months later, when the fruits are ripening into carmine a scene of the most bustling animation ensues, for old and young are busily employed in plucking the swelling berries, and hurrying with filled baskets to the nearest pulping mill.

In Ceylon the native woodmen are singularly expert in felling forest trees preparatory to the cultivation of coffee. Turning to advantage the luxuriance of tropical vegetation, which lashes together whole forests by a maze of interlacing climbers as firm and massy as the cables of a line-of-battle ship, their practice in steep and mountainous places is to cut half-way through each stem in succession, till an area of some acres in extent is prepared for the final overthrow. They then sever some tall group on the eminence, and allow it in its decent to precipitate itself on those below, when the whole expanse is in one moment brought headlong to the ground, the falling timber forcing down those beneath it by its weight, and dragging those behind to which it is harnessed. The crash occasioned by this startling operation is so loud that it is audible for two or three miles in the clear and still atmosphere of the hills.

Like the sugar-cane, or indeed any other plant cultivated by man, the coffee-tree is exposed to the ravages of many enemies. Wild cats, monkeys, and squirrels prey upon the ripening berries, and hosts of caterpillars feed upon the leaves. Since 1847 the Ceylon plantations have been several times

invaded by swarms of the Golunda, a species of rat which inhabits the forests, making its nest among the roots of the trees, and, like the lemmings of Lapland, migrating in vast numbers when the seeds of the nillo-shrub (*Strobilanthes*), its ordinary food, are exhausted. 'In order to reach the buds and blossoms of the coffee, the Golunda eats such slender branches as would not sustain its weight, and feeds as they fall to the ground; and so delicate and sharp are its incisors, that the twigs thus destroyed are detached by as clean a cut as if severed with a knife.'\*

Another great enemy of the Ceylon planters is the *Lecanium*



THE COFFEE RAT.

*Coffea*, a species of *coccus*, which establishes itself on young shoots and buds, covering them with a noisome incrustation of scales, from the influence of which the fruit shrivels and drops off. A great part of the crop is sometimes lost, and on many trees not a single berry forms from the invasion of this insect plague.

Theobroma,—food for gods,—the Greek name given by Linnæus to the cacao or chocolate tree, sufficiently proves how highly he valued the flavour of its seeds.

Indigenous in Mexico, it had long been in extensive cultivation before the arrival of the Spaniards, who found the beverage

\* Tennant's 'Ceylon,' vol. ii. p. 234.

which the Indians prepared from its beans so agreeable that they reckoned it among the most pleasing fruits of their conquest, and lost no time in making their European friends acquainted with its use. From Mexico they transplanted it into their other dependencies, so that in America its present range of cultivation extends from 20° N. lat. to Guayaquil and Bahia. It has even been introduced into Africa and Asia, in return for the many useful trees that have been imported from the Old into the New World. The cacao-tree seldom rises above the height of twenty feet; its leaves are large, oblong, and pointed. The flowers, which are of a pale red colour, grow on the stem and larger branches, and spring even from the roots. 'Never,' says Humboldt, 'shall I forget the deep impression made upon me by the luxuriance of tropical vegetation on first seeing a cacao-plantation. After a damp night, large blossoms of the theobroma issue from the root at a considerable distance from the trunk, emerging from the deep black mould. A more striking example of the expansive powers of life can hardly be met with in organic nature.' The fruits are large, oval, pointed pods, about five or six inches long, and containing in five compartments from twenty to forty beans.

The trees are raised from seed, generally in places screened from the wind. As they are incapable of bearing the scorching rays of the sun, particularly when young, bananas, maize, manioc, and other broad-leaved plants are sown between their rows, under whose shade they enjoy the damp and sultry heat which is indispensable to their growth, for the *Theobroma Cacao* is essentially tropical, and requires a warmer climate than the coffee-tree or the sugar-cane.

Two years after having been sown, the plant attains a height of three feet, and sends forth many branches, of which however but four or five are allowed to remain. The first fruits appear in the third year, but the tree does not come into full bearing before it is six or seven years old, and from that time forward it continues to yield abundant crops of beans during more than twenty years. When an Indian can get a few thousand cacao-trees planted, he passes an idle, quiet, contented life; all he has to do is to weed under the trees two or three times in the year, and to gather and dry the seeds in the sun.

Cacao is chiefly used under the form of chocolate. The

beans are roasted, finely ground, so as to convert them into a perfectly smooth paste, and improved in flavour by the addition of spices, such as the sweet-scented vanilla, a short notice of which will not be out of place.

Like our parasitical ivy, the *Vanilla aromatica*, a native of torrid America, climbs the summits of the highest forest-trees, or creeps along the moist rock crevices on the banks of rivulets.

The stalk, which is about as thick as a finger, bears at each joint a lanceolate and ribbed leaf, twelve inches long and three inches broad. The large flowers which fill the forest with their delicious odours, are white intermixed with stripes of red and yellow, and are succeeded by long and slender pods containing many seeds imbedded in a thick oily and balsamic pulp. These pods seldom ripen in the wild state, for the dainty monkey knows no greater delicacy, and his agility in climbing almost always enables him to anticipate man.

At present the vanilla is cultivated not only in Mexico, but in Java, where the industrious Dutch have acclimatised it since 1819. It is planted under shady trees on a damp ground, and grows luxuriantly; but as a thousand blossoms on an average produce but one pod, it must always remain a rare and costly spice.

Although but little known beyond the confines of its native country, Coca is beyond all doubt one of the most remarkable productions of the tropical zone.

The sultry valleys on the eastern slopes of the Peruvian and Bolivian Andes are the seat of the *Erythroxyton Coca*, which, like the coffee-tree, bears a lustrous green foliage, and white blossoms ripening into small scarlet berries. The leaves when brittle enough to break on being bent, are stripped from the plant, dried in the sun, and closely packed in sacks. The naked shrub soon gets covered with new foliage, and after three or four months its leaves are ready for a second plucking, though in some of the higher mountain-valleys it can only be stripped once a year. Like the coffee-tree, the coca-shrub thrives only in a damp situation, under shelter from the sun; and for this reason maize, which rapidly shoots up, is generally sown between the rows of the young plants.

The local consumption of coca is immense, as the Peruvian

Indian reckons its habitual use among the prime necessities of life, and is never seen without a leathern pouch filled with a provision of the leaves, and containing besides a small box of powdered unslaked lime. At least three times a day he rests from his work to chew his indispensable coca. Carefully taking a few leaves out of the bag, and removing their midribs, he first masticates them in the shape of a small ball, which is called an *acullico*; then repeatedly inserting a thin piece of moistened wood like a toothpick into the box of unslaked lime, he introduces the powder which remains attached to it into the *acullico* until the latter has acquired the requisite flavour. The saliva, which is abundantly secreted while chewing the pungent mixture, is mostly swallowed along with the green juice of the plant.

When the *acullico* is exhausted, another is immediately prepared, for one seldom suffices. The corrosive sharpness of the unslaked lime requires some caution, and an unskilled coca-chewer runs the risk of burning his lips, as, for instance, the celebrated traveller Tschudi, who, by the advice of his muleteer, while crossing the high mountain-passes of the Andes, attempted to make an *acullico*, and instead of strengthening himself as he expected, merely added excruciating pain to the fatigues of the journey.

The taste of coca is slightly bitter and aromatic, like that of bad green tea, but the addition of lime, or of the sharp ashes of the quinoa, renders it less disagreeable to the European palate.

It is a remarkable fact that the Indians who regularly use coca require but little food, and when the dose is augmented are able to undergo the greatest fatigues without tasting almost anything else. Professor Pöppig ascribes this astonishing increase of endurance to a momentary excitement, which must necessarily be succeeded by a corresponding collapse, and therefore considers the use of coca absolutely hurtful. Tschudi, however, is of opinion that its moderate consumption, far from being injurious, is, on the contrary, extremely wholesome, and cites the examples of several Indians who, never allowing a day to pass without chewing their coca, attained the truly patriarchal age of one hundred and thirty years. The ordinary food of these people consists almost exclusively of roasted maize or barley, which is eaten dry without any other addition:

and the obstinate obstructions caused by these mealy aliments are obviated by the tonic effects of the coca, which thus removes the cause of many maladies.

Tschudi often found coca the best preservative against the asthmatic symptoms which are produced by the rapid ascension of high mountains. While hunting in the Puna, 14,000 feet above the level of the sea, he always drank a strong infusion of coca before starting, and was then able to climb among the rocks, and to pursue his game, without any greater difficulty in breathing than would have been the case upon the coast.

If the moderate use of coca is thus beneficial in many respects, its abuse is attended with the same deplorable consequences as those which are observed in the oriental opium-eaters and smokers, or in our own incorrigible drunkards.

The confirmed coca-chewer, or coquero, is known at once by his uncertain step, his sallow complexion, his hollow, lack-lustre black-rimmed eyes, deeply sunk in the head, his trembling lips, his incoherent speech, and his stolid apathy. His character is irresolute, suspicious, and false; in the prime of life, he has all the appearances of senility, and in later years sinks into complete idiocy. Avoiding the society of man, he seeks the dark forest, or some solitary ruin, and there, for days together, indulges in his pernicious habit. While under the influence of coca, his excited fancy riots in the strangest visions, now revelling in pictures of ideal beauty, and then haunted by dreadful apparitions. Secure from intrusion, he crouches in an obscure corner, his eyes immovably fixed upon one spot; and the almost automatic motion of the hand raising the coca to the mouth, and its mechanical chewing, are the only signs of consciousness which he exhibits. Sometimes a deep groan escapes from his breast, most likely when the dismal solitude around him inspires his imagination with some terrific vision, which he is as little able to banish as voluntarily to dismiss his dreams of ideal felicity. How the coquero finally awakens from his trance, Tschudi was never able to ascertain, though most likely the complete exhaustion of his supply at length forces him to return to his miserable hut.

No historical record informs us when the use of the coca was introduced, or who first discovered the hidden virtues of its leaves. When Pizarro destroyed the empire of Atahualpa he found that it played an important part in the religious rites of

the Incas, and that it was used in all public ceremonies, either for fumigation or as an offering to the gods. The priests chewed coca while performing their rites, and the favour of the invisible powers was only to be obtained by a present of these highly valued leaves. No work begun without coca could come to a happy termination, and divine honours were paid to the shrub itself.

After a period of more than three centuries, Christianity has not yet been able to eradicate these deeply-rooted superstitious feelings, and everywhere the traveller still meets with traces of the ancient belief in its mysterious powers. To the present day, the miners of Cerro de Pasco throw chewed coca against the hard veins of the ore, and affirm that they can then be more easily worked,—a custom transmitted to them from their forefathers, who were fully persuaded that the Coyas or subterranean divinities rendered the mountains impenetrable unless previously propitiated by an offering of coca. Even now the Indians put coca into the mouths of their dead, to insure them a welcome on their passage to another world; and whenever they find one of their ancestral mummies, they never fail to offer it some of the leaves.

During the first period after the conquest of Peru, the Spaniards endeavoured to extirpate by all possible means the use of coca, from its being so closely interwoven with the Indian superstitions; but the proprietors of the mines soon became aware how necessary it was for the successful prosecution of their undertakings; the planters also found after a time that the Indians would not work without it; private interest prevailed, as it always does in the long run, over religious zeal and despotic interdictions, and in the last century we even find a Jesuit, Don Antonio Julian, regretting that the use of coca had not been introduced into Europe as well as that of tea and coffee.

When we consider its remarkable properties, it is indeed astonishing that it has so long remained unnoticed. Were it concealed in the interior of Africa, or extremely difficult to procure, this neglect could be more easily accounted for; but hundreds of our vessels annually frequent the harbours of Peru and Bolivia, where it may be obtained in large quantities, and yet its tonic and stimulating powers are but just beginning to attract the attention of the medical world.



CAOUTCHOUC TREES (INDIANS INCISING THEM).

## CHAPTER XVI.

### TROPICAL PLANTS USED FOR INDUSTRIAL PURPOSES.

Cotton—Its Cultivation in the United States—Caoutchouc and Gutta Percha—Manner in which these resins are collected—Indigo—The British Logwood cutters in Honduras—Brazil Wood—Arnatto.

**U**NDER the Plantagenets and the Tudors, wool formed the chief export of England. The pastoral races that inhabited the British Isles, unskilled in weaving, suffered the more industrious Flemings to convert their fleeces into tissues; and the dominions of the Duke of Burgundy, enriched by manufactures and by the stimulus they gave to agriculture, became the most prosperous part of Europe. At length the islanders began to discover the sources of the wealth which rendered Ghent and Bruges, Ypres and Louvain, the marvel and envy of the mediæval world; and gradually learning to keep their wool at home, invited the Flemings to the shores of England.

The bigoted oppression of Spain came in aid of this more enlightened policy: our wool ceased to be sent abroad, and English cloth eventually became the chief of our exports. But, like all human affairs, trade is subject to eternal fluctuation, new wants are constantly created, new markets opened, new articles introduced, and thus, almost within the memory of living man, the wool-manufactory has ceased to be the great staple of our

industry ; and, thanks to the inventive genius of our Arkwrights and Cromptons, a vegetable fibre furnished by a plant totally unknown to our forefathers, now ranks as the first of all the world-wide importations of England.

There are many different species of the cotton-plant, herbaceous, shrubby, and arboreal. Their original birthplace is the tropical zone, where they are found growing wild in all parts of the world ; but the herbaceous species still thrive under a mean temperature of from  $60^{\circ}$  to  $64^{\circ}$  F., and are capable of being cultivated with advantage as far as  $40^{\circ}$  or even  $46^{\circ}$  N. lat. The five-lobed leaves have a dark green colour, the flowers are yellow with a purple centre, and produce a pod about the size of a walnut, which, when ripe, bursts and exhibits to view the fleecy cotton in which the seeds are securely embedded.

It is almost superfluous to mention that the United States is the first cotton-producing country in the world. The area suitable for cotton south of the thirty-sixth degree of latitude, comprises more than 39,000,000 acres, of which less than one-sixth part is now devoted to the plant. The yield depends in part upon the length of the season. Seven months are required for an average crop, and the average periods in which the last killing frost of spring and the first killing frost of autumn occur are March 23, and October 26. Cotton is cultivated in large fields, and when the soil is superior, the plant rises to a height of six or eight feet, although in the richest cane-brake soil, exhausted by successive crops, it dwindles down to a height of three or four feet only. The aspect of a cotton field is most pleasing in the autumn, when the dark-coloured foliage and bright yellow flowers, intermingling with the snow-white down of the pods when burst, produce a charming contrast. At that time all hands are at work, for it is important to pluck as much as possible during the first hours of morning, since the heat of the sun injures the colour of the cotton, and the over-ripe capsules shed their contents upon the ground, or allow the wind to carry them away.

The collected produce is immediately carried to the steam-mill to be cleansed of the seeds, and then closely packed in bales, which in the seaports are further reduced by hydraulic presses to half of their previous volume, thus causing a great saving in the freight. Large clippers frequently carry eight or ten

thousand of these bales to Liverpool, whence, perhaps on the day of their arrival, they are conveyed by rail to the next manufacturing town, which returns them in a few days to the port, ready to clothe the Australian gold-digger or the labourer on the banks of the Ganges.

India, which still in the last century provided Europe with the finest cambrics and muslins, now yearly receives from England cotton goods to a large amount. Thus the stream of trade may be said to have rolled backwards to its source, for though the wants of the Hindoo are easily satisfied, and cotton grows at his very door, yet his hand-loom is unable to compete with the machinery and the capital of England. Even in the exportation of the raw material he labours under great disadvantage when compared with America, though railroads and a better system of culture have done much to improve the quality and facilitate the transport of Indian cotton.

When we consider the luxuriance of vegetation in the tropical zone, it is not to be wondered at that so many plants of those climes abound with juices of a variety and richness unknown to those of the temperate latitudes. The resins and gums which our indigenous trees produce, either in smaller quantities or fit only for common uses, are there endowed with higher virtues, and ennobled, as it were, by the rays of a more powerful sun. Sometimes they exude spontaneously through the rind and harden in the atmosphere; more frequently a slight incision is required to make the sap gush forth in which they are dissolved, but in every case they require but trifling labour for their collection. Many of them have medicinal qualities, others are esteemed for their aromatic odour, but none ranks higher in a commercial and technical point of view than caoutchouc or India-rubber, which was first brought from South America to Europe as a great curiosity at the beginning of the last century, and is now absolutely indispensable for a thousand different uses. Nothing was known even of its origin until the year 1736, when the French naturalist La Condamine, while exploring the banks of the Amazon, discovered that it was chiefly produced by the *Siphonia elastica*, a large tree growing wild in the primitive forests along the borders of the rivers in Guiana and North Brazil.

The resin is collected by the Indians in a very simple

manner. With a small hatchet they make deep and long incisions in the rind, from which a milky sap abundantly exudes. A small wooden peg is then fixed into each aperture to prevent its closing, and a cup of moist clay fastened underneath, which in about four or five hours is filled with as many table-spoonfuls of the juice. The produce of a number of incisions having been gathered in a large earthen vessel, is then spread in thin coatings upon moulds made of clay, and dried, layer after layer, over a fire, until the whole has acquired a certain thickness. When perfectly dry, the clay form within is broken into small fragments, and the pieces are extracted through an aperture, which is always left for the purpose.

Besides the *Siphonia elastica*, many other American trees, belonging to the families of the Euphorbiaceæ and Urticeæ, afford excellent kinds of caoutchouc; and since it is become so valuable an article of commerce, the East Indies, and Java likewise, yield considerable quantities, chiefly from the *Urceola elastica* and the *Ficus elastica*.

The *Icosandra Gutta*, which furnishes the gutta percha of commerce, is a native of the Eastern Archipelago and the adjacent lands. A few years since, this substance, now so celebrated and of such wide extended use, was totally unknown in Europe, for though from time immemorial the Malays employed it for making the handles of their hatchets and creeses, it was only in the year 1843 that Mr. Montgomery, an English surgeon, having casually become acquainted with its valuable properties, sent an account of it, with samples, to the Royal Society, for which he was most justly rewarded with its gold medal. The fame of the new article spread rapidly throughout the world; science and speculation seized upon it with equal eagerness; a thousand newspapers promulgated its praises; it was immediately analysed, studied, and tried in every possible way, so that it is now as well known and as extensively used as if it had been in our possession for centuries.

The *Icosandra Gutta* is a large high tree, with a dense crown of rather small dark green leaves, and a round smooth trunk. The white blossoms change into a sweet fruit, containing an oily substance fit for culinary use. The wood is soft, spongy, and contains longitudinal cavities filled with brown stripes of gutta percha. The original method of the Malays for collect-

ing the resin consisted in felling the tree, which was then placed in a slanting position, so as to enable the exuding fluid to be collected in banana leaves. This barbarous proceeding, which from the enormous demand which suddenly arose for the gutta would soon have brought the rapidly rising trade to a suicidal end, fortunately became known before it was too late, and the resin is now gathered in the same manner as caoutchouc, by making incisions in the bark with a chopping knife, collecting the thin, white, milky fluid which exudes in large vessels, and allowing it to evaporate in the sun or over a fire. The solid residuum, which is the gutta percha of commerce, is finally softened in hot water, and pressed into the form of slabs.

Gutta percha has many properties in common with caoutchouc, being completely insoluble in water, tenacious, but not elastic, and an extremely bad conductor of caloric and electricity. The name of vegetable leather which has been applied to it, gives a good idea both of its appearance and tenacity.

Its uses are manifold. It serves for water-pipes, for vessels fit for the reception of alkaline or acid liquids which would corrode metal or wood, for surgical implements, for boxes, baskets, combs, and a variety of other articles. The wonder of the age, submarine telegraphy, could hardly have been realised without it, as it is only by being cased in so isolating a substance, and one so impermeable by water, that the metallic wire is able to transmit the galvanic stream through the depths of ocean from land to land.

Of all the dyeing substances which the tropical zone produces in such endless variety, none is more important in a commercial point of view than indigo. Various species of plants producing this beautiful cerulean colour are found growing spontaneously in the warmer countries of both hemispheres, but the *Indigofera tinctoria* is most generally cultivated. The knotty shrubby plant rises about two feet from the ground; the leaves are winged like those of the acacia, smooth and soft to the touch, furrowed above, and of a darker colour on the upper than the under side. The small reddish flowers which grow in ears from the axillæ of the leaves have no smell, and are succeeded by long crooked brown pods, which contain small yellow seeds. The plant requires a smooth rich soil, well tilled, and neither too dry nor too moist. A child of the sun, it cannot be

advantageously cultivated anywhere except within the tropics, a higher mean temperature than  $60^{\circ}$  being absolutely necessary for its vegetation. The seed is sown in furrows a foot apart from each other, and two or three inches in depth. Sufficient moisture causes it to shoot above the surface in three or four days, and it is usually fit for gathering at the end of two months. When it begins to flower it is cut with a sickle a few inches above the roots, and furnishes, after six or eight weeks, a second crop. The cultivation of indigo would thus seem to be extremely profitable, but the sun, which so rapidly improves and invigorates the plant, calls forth at the same time a multitude of



CUTTING THE INDIGO PLANT.

insects and caterpillars, that prey upon the valuable leaves, and frequently disappoint the planter's expectations.

All the intermediate shades of violet and purple may be obtained from the mixture of red and blue, varying according to the different proportions wherein these colours are applied. There are, however, some few vegetable substances which yield a violet or purple dye, without being combined with another colour, and of these logwood is the most important. The stately tree which furnishes this valuable article of commerce is a native of the western world, having been first discovered in

the swampy forests of Yucatan, and in the low alluvial grounds that girdle the Bays of Campeachy and Honduras.

About the year 1661, logwood became in great request; and as the indolent Spaniards to whom the country at that time belonged failed to supply the market, several English adventurers, without first asking permission, settled or squatted on the uninhabited coast of Yucatan, and made the woods near Laguna de Terminos ring with the sound of their industrious axe. Many years passed without the Spaniards taking any notice of the intruders; but as these, growing bolder by sufferance, began to penetrate farther into the country, to build houses and form plantations, as if they had been masters of the soil, their jealousy was at length aroused, and in 1680 the English settlers were forcibly ejected. This triumph on the part of their adversaries was, however, but transitory; and a few months after our sturdy countrymen were again cutting their logwood as busily as ever, in spite of the enmity of man and the innumerable hardships of their laborious occupation.

Their mode of life is thus quaintly described by Dampier in his *Voyage to the Bay of Campeachy*:—‘The logwood-cutters inhabit the creeks of the lagunes in small companies, building their huts by the creeks’ sides for the benefit of the sea-breeze, as near the logwood groves as they can, and often removing to be near their business. Though they build their huts but slightly, yet they take care to thatch them very well with palmetto leaves, to prevent the rains, which are there very violent, from soaking in. For their bedding, they raise a wooden frame, three feet and a half above ground on one side of the house, and stick up four stakes at each corner, to fasten their curtains, out of which there is no sleeping for mosquitoes. Another frame they raise, covered with earth, for a hearth, to dress their victuals; and a third to sit at, when they eat it. During the wet season, the land where the logwood grows is so overflowed that they step from their beds into the water, perhaps two feet deep, and continue standing in the wet all day till they go to bed again; but, nevertheless, account it the best season for doing a good day’s labour in. Some fell the trees, others saw and cut them into convenient logs, and one chips off the bark, and he is commonly the principal man; and when a tree is so thick that after it is logged it

remains still too great a burden for one man, it is blown up with gunpowder. The logwood-cutters are generally sturdy strong fellows, and will carry burthens of three or four hundred-weight. In some places they go a-hunting wild cattle every Saturday to provide themselves with beef for the week following. When they have killed a beef they cut it into quarters, and taking out the bones, each man makes a hole in the middle of his quarter, just big enough for his head to go through, then puts it on like a frock and trudgeth home; and, if he chanceth to tire, he cuts off some of it and throws it away.'

The entire freedom from all restraint which accompanied this wild and adventurous life had such charms for Dampier's bold and roving spirit, that he sojourned for about a year among the rude wood-cutters of Campeachy, and left them with the intention of again returning for a longer stay.

Most of the red dye-woods are furnished by the *Cæsalpinias*, a genus of plants belonging to the widespread family of the Leguminosæ, and indigenous in both hemispheres. The *C. crista*, which furnishes the best quality, commonly known under the name of Brazil wood, grows profusely in the forests of that vast empire, preferring dry places and a rocky ground. Its trunk is large, crooked, and full of knots; at a short distance from the ground innumerable branches spring forth and extend in every direction in a straggling manner. The branches are armed with short strong upright thorns, the leaves are small, and never appear in luxuriant foliage. The flowers are of a beautiful red colour, and emit a fragrant smell. Both the thick bark and the white pithy part of the trunk are useless, the hard close-grained heart being the only portion impregnated with colouring matter. The wood is sometimes used in turning, and is susceptible of a good polish, but its chief use is as a red dye. By the addition of acids it produces a permanent orange or yellow colour, while the crimson tints which it imparts are very fleeting.

The first Europeans that settled on the banks of the Amazons found that several of the Indian tribes that roamed about in their vicinity painted their bodies with a showy orange-red colour. Their attention was by this means attracted to the Arnatto (*Bixa orellana*), which attains about the size of our

hazel-tree. The heart-shaped leaves are about four inches long, of a lighter green on the upper surface, and divided by fibres of a reddish-brown colour ; the rosy flowers are succeeded by bristled pods somewhat resembling those of a chestnut, which, bursting open when ripe, display a splendid crimson farina or pulp, in which are contained thirty or forty seeds, in shape similar to raisin stones. As soon as they have arrived at maturity the pods are gathered, divested of their husks, bruised, immersed in water, and after a few weeks beaten with sticks to promote the separation of the pulp from the seeds. The turbid liquor is then strained, boiled to a consistent paste, and finally formed into cakes, which are left to dry in the sun. In England arnatto is generally used by the dyer to give a deeper shade to the simple yellow. Being perfectly soluble in spirits of wine, it is much used in this state for lacquering and for giving an orange tint to the yellow varnishes. It is likewise employed in large quantities as a colouring ingredient for cheese, to which it gives the required tinge without imparting any unpleasant flavour or unwholesome quality.



CINNAMON.



CLOVE.

## CHAPTER XVII.

### TROPICAL SPICES.

The Cinnamon Gardens of Ceylon—Immense profits of the Dutch—Decline of the Trade—Neglected state of the Gardens—Nutmegs and Cloves—Cruel monopoly of the Dutch—A Spice Fire in Amsterdam—The Clove Tree—Beauty of an Avenue of Clove Trees—The Nutmeg Tree—Mace—The Pepper Vine—The Pimento Tree.

**A**LTHOUGH the beautiful laurel whose bark furnishes the most exquisite of all the spices of the East, is indigenous to the forests of Ceylon, yet, as no author previous to the fourteenth century mentions its aromatic rind among the productions of the island, there is every reason to believe that the cinnamon, which in the earlier ages was imported into Europe through Arabia, was obtained first from Africa, and afterwards from India. That the Portuguese, who had been mainly attracted to the East by the fame of its spices, were nearly twenty years in India before they took steps to obtain a footing at Colombo, proves that there can have been nothing very remarkable in the quality of the spice at the beginning of the sixteenth century, and that the high reputation of the Ceylon cinnamon is comparatively modern, and attributable to the attention bestowed upon its preparation for market by the Portuguese, and afterwards on its cultivation by the Dutch.

Long after the appearance of Europeans in Ceylon, cinnamon was only found in the forests of the interior, where it was cut and brought away by the *Chalias*, an emigrant tribe which, in consideration of its location in villages, was bound to go into

the woods to cut and deliver, at certain prices, a given quantity of cinnamon properly peeled and ready for exportation.

This system remained unchanged so long as Portugal was master of the country, but the forests in which the spice was found being exposed to constant incursions from the Kandyans, the Dutch were compelled to form enclosed plantations of their own within range of their fortresses. The native chieftains, fearful of losing the profits derived from the labour of the Chalias, who were attached as serfs to their domains, and whose work they let out to the Dutch, were at first extremely opposed to this innovation, and endeavoured to persuade the Hollanders that the cinnamon would degenerate as soon as it was artificially planted. The withering of many of the young trees seemed to justify the assertion, but on a closer examination it was found that boiling water had been poured upon the roots. A law was now passed declaring the wilful injury of a cinnamon plant a crime punishable with death, and by this severity the project was saved.

The extent of the trade during the time of the Dutch may be inferred from the fact, that the five principal cinnamon-gardens around Nejombo, Colombo, Barberyn, Galle, and Maduro were each from fifteen to twenty miles in circumference. Although they were only first planted in the year 1770, yet before 1796, when Colombo was taken by the English, their annual produce amounted to more than 400,000 lbs. of cinnamon, as much as the demands of the market required.

The profits must have been enormous, for cinnamon was then at least ten times dearer than at present, the trade being exclusively in the hands of the Dutch East Indian Company, which, in order to keep up the price, restricted the production to a certain quantity, and watched over its monopoly with the most jealous tyranny. No one was allowed to plant cinnamon or to peel it, and the selling or importing of a single stick was punished as a capital offence. Since that time the cultivation of the cinnamon laurel having been introduced into many other tropical lands, competition has reduced prices, and the spice which was formerly the main product of Ceylon is now of very inferior importance. The cinnamon-gardens, whose beauty and luxuriance has been so often vaunted by travellers, have partly been sold, partly leased to private individuals, and though less

than a century has elapsed since they were formed by the Dutch, they are already becoming a wilderness. Those which surround Colombo on the land side exhibit the effects of a quarter of a century of neglect, and produce a feeling of disappointment and melancholy. The beautiful shrubs which furnish this spice have been left to the wild growth of nature, and in some places are entirely supplanted by an undergrowth of jungle, while in others a thick cover of climbing plants and other parasites conceals them under masses of verdure and blossom. It would, however, be erroneous to suppose that the cinnamon-gardens have been universally doomed to the same neglect. Thus Professor Schmarda, who visited Mr. Stewart's plantation two miles to the south of Colombo, admired the beautiful order in which it was kept. A reddish sandy clay and fine white quartz sand form the soil of the plantation. White sand is considered as the best ground for the cinnamon tree to grow on, but it requires an abundance of rain (which is never wanting in the south-western part of the island), much sun, and many termites. For these otherwise so destructive creatures do not injure the cinnamon trees, but render themselves useful by destroying many other insects. They consequently remain unmolested, and everywhere raise their high conical mounds in the midst of the plantation. The aspect of a well-conditioned cinnamon-garden is rather monotonous, for though the trees when left to their full growth attain a height of forty or fifty feet, yet, as the best spice is furnished by the shoots that spring from the roots after the chief stem has been removed, they are kept as a kind of coppice, and not allowed to rise higher than ten feet.

Nutmegs and cloves, the costly productions of the remotest isles of the Indian Ocean, were known in Europe for centuries before the countries where they grow had ever been heard of. Arabian navigators brought them to Egypt, where they were purchased by the Venetians, and sold at an enormous profit to the nations of the West. But, as is well known, the commercial grandeur of the City of the Lagunes was suddenly eclipsed after Vasco de Gama discovered the new maritime road to the East Indies, round the Cape of Good Hope (1498); and when, a few years later, the countrymen of the great navigator conquered the Moluccas (1511), they for a short time mono-

polished the whole spice trade much more than their predecessors had ever done before. But here also, as in Ceylon, the Portuguese were soon obliged to yield to a stronger rival; for the Dutch now appeared upon the scene, and by dint of enterprise and courage soon made themselves masters of the Indian Ocean. In 1605 they drove the Portuguese from Amboyna, and before 1621 had elapsed the whole of the Moluccas were in their possession. Five-and-twenty years later, Ceylon also fell into their hands, and thus they became the sole purveyors of Europe with cinnamon, cloves, and nutmegs. Unfortunately, the scandalous manner in which they misused their power throws a dark shade over their exploits. For the better to secure the monopoly of the spice trade, they declared war against nature itself, allowed the trees to grow only in particular places, and extirpated them everywhere else. Thus the planting of the nutmeg tree was confined to the small islands of Banda, Lonthoir, and Pulo Aij, and that of the clove to Amboyna. Wherever the trees were seen to grow in a wild state they were unsparingly rooted up, and the remainder of the Moluccas were occupied and subjugated for no other reason. The natives were treated with unmerciful cruelty, and blood flowed in torrents to keep up the prices of cloves and nutmegs at an usurious height.

When the spices accumulated in too large a quantity for the market, they were thrown into the sea or destroyed by fire. Thus M. Beaumare, a French traveller, relates that on June 10, 1760, he beheld near the Admiralty at Amsterdam a blazing pile of cinnamons and cloves, valued at four millions of florins, and an equal quantity was to be burnt the next day. The air was perfumed with their delicious fragrance, the essential oils freed from their confinement distilled over, mixing in one spicy stream, which flowed at the feet of the spectators; but no one was suffered to collect any of this, or, on pain of heavy punishment, to rescue the smallest quantity of the spice from the flames.

Fortunately these distressing scenes—for it is painful to see man, under the impulse of an insatiable greed, thus wilfully destroying the gifts of Nature—belong to the history of the past. The reign of monopoly has ceased even in the remote Moluccas, and their ports are now, at length, thrown open to

the commerce of all nations ; for the spice trees having been transplanted into countries beyond the control of the Dutch, the ancient system could not possibly be maintained any longer.

The clove tree belongs to the far-spread family of the myrtles ; the small lanceolate evergreen leaves resemble those of the laurel, the flowers growing in bunches at the extremity of the branches. When they first appear, which is at the beginning of the rainy season, they are in the form of elongated greenish buds, from the extremity of which the corolla is expanded, which is of a delicate peach-blossom colour. The corolla having fallen off, the calyx turns yellow, and then red ; when it is beaten from the tree, and dried in the sun. If the fruit be allowed to remain longer on the tree the calyx or clove gradually swells, the embryo seed enlarges, and the pungent properties of the clove are in great part dissipated.

The whole tree is highly aromatic, and the foot-stalks of the leaves have nearly the same pungent quality as the calyx of the flowers. ‘Clove trees,’ says Sir Stamford Raffles, ‘as an avenue to a residence, are perhaps unrivalled—their noble height, the beauty of their form, the luxuriance of their foliage, and, above all, the spicy fragrance with which they perfume the air, produce, on driving through a long line of them, a degree of exquisite pleasure only to be enjoyed in the clear light atmosphere of the Eastern Archipelago.’

In spite of the endeavours of the Dutch to confine the nutmeg tree to the narrow precincts of Banda, it has likewise extended its range not only over Sumatra, Mauritius, Bourbon, and Ceylon, but even over the western hemisphere. It is of a more majestic growth than the clove, as it attains a height of fifty feet, and the leaves of a fine green on the upper surface, and grey beneath, are more handsome in the outline, and broader in proportion to the length. When the trees are about nine years old, they begin to bear. They are diœcious, having male or barren flowers upon one tree, and female or fertile upon another. The flowers of both are small, white, and bell-shaped ; the embryo-fruit appearing at the bottom of the female flowers in the form of a little reddish knob. When ripe, it resembles in appearance and size a small peach, and then the outer rind, which is about half an inch thick, bursts

at the side, and discloses a shining black nut, which seems the darker from the contrast of the leafy network of a fine red colour with which it is enveloped. The latter forms the Mace of commerce, and having been laid to dry in the shade for a short time, is packed in bags and pressed together very tightly.



NUTMEG.

The shell of the nut is larger and harder than that of the filbert, and could not, in the state in which it is gathered, be broken without injuring the nut. On that account the nuts are successively dried in the sun and then by fire-heat, till the kernel shrinks so much as to rattle in the shell, which is then easily broken.

Although not so costly as cloves or cinnamon, pepper is of a much greater commercial value, as its consumption is at least a hundred times greater. It grows on a beautiful vine, which, incapable of supporting itself, twines round poles or mango and other trees of straight high stems. As these are stripped of the lower branches, the vine embraces the trunk, covering it with elegant festoons and rich bunches of fruit in the style of the Italian vineyards.



PEPPER PLANT.

The leaf of the pepper plant is large, resembling that of the ivy, and of a bright green; the blossoms appear in June, soon after the commencement of the rains; they are small, of a greenish white, and are followed by the pungent berries, which hang in large bunches, resembling in shape those of grapes, but the fruit grows distinct on little stalks like currants.

This valuable spice grows chiefly on the Malabar Coast, in Sumatra, Borneo, Java, Singapore; its cultivation has also been introduced in Cayenne and the West Indies. The black and white sorts of pepper are both the produce of the same plant.

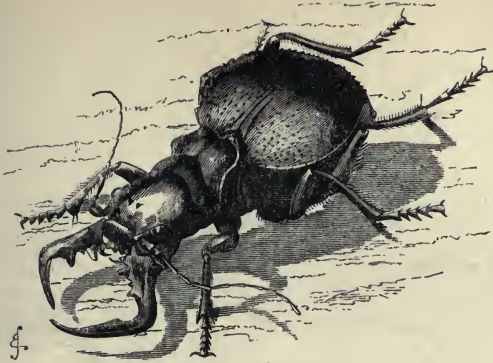
The best white peppers are supposed to be the finest berries, which drop from the tree, and, lying under it, become somewhat bleached by exposure to weather; the greater part of the white pepper used as a condiment is, however, the black merely steeped in water, and decorticated, by which means the pungency and real value of the spice are diminished; but having a fairer and more uniform appearance when thus prepared, it fetches a higher price.

Jamaica is the chief seat of the magnificent myrtle (*Myrtus pimenta*), which furnishes the pimento of commerce. This beautiful tree grows to the height of about thirty feet, with a smooth, brown trunk, and shining green leaves resembling those of the bay. In July and August a profusion of white flowers, filling the air with their delicious odours, forms a very pleasing contrast to the dark foliage of its wide-spreading branches. It grows spontaneously in many parts of the island, particularly on the northern side, in high spots near the coast.

When a new plantation is to be formed, no regular planting or sowing takes place, for, as Edwards ('History of Jamaica') observes, 'the pimento tree is purely a child of Nature, and seems to mock all the labours of man in his endeavours to extend or improve its growth; not one attempt in fifty to propagate the young plants, or to raise them from the seeds in parts of the country where it is not found growing spontaneously, having succeeded. For this reason, a piece of land is chosen, either in the neighbourhood of a plantation already formed, or in a part of the woodland where the pimento-myrtles are scattered in a native state. The land is then cleared of all wood but these trees, which are left standing, and the felled timber is allowed to remain, where it falls to decay, and perishes. In the course of a year, young pimento plants are found springing up on all parts of the land, produced, it is supposed, in consequence of the ripe berries having been scattered there by the birds, while the prostrate trees protect and shade the tender seedlings. At the end of two years the land is thoroughly cleared, and none but the most vigorous plants, which come to maturity in about seven years, are left standing.'

The berries are carefully picked while yet green, since, when suffered to ripen, they lose their pungency. One person on the tree gathers the small branches, and three others, usually women

and children, find full employment in picking the berries from them. The produce is then exposed to the sun for about a week, when the berries lose their green hue and become of a reddish brown. When perfectly dry, they are in a fit state for exportation. In favourable seasons, which, however, seldom occur above once in five years, the pimento crop is enormous, a single tree having been known to yield one hundredweight of the dried spice. From its combining the flavour and properties of many of the oriental aromatics, pimento has derived its popular name of allspice, and, from its being cheaper than black pepper, its consumption is very great.



MANTICHORA MYGALOIDES.

## CHAPTER XVIII.

### TROPICAL INSECTS, SPIDERS, AND SCORPIONS.

Gradual increase of Insect Life on advancing towards the Line—The Hercules Beetle—The Goliath—The Inca Beetle—The Walking-leaf, and Walking-stick Insects—The Soothsayer—Luminous Beetles—Tropical Spiders—Their gaudy colours—Trap-door Spiders—Enemies of the Spiders—Mortal Combat between a Spider and a Cockroach—Tropical Scorpions—Dreadful effects of their sting.

ON advancing from the temperate regions to the line, we find the insects gradually increasing with the multiplicity of plants, and at length attaining the greatest size, brilliancy of colour, and variety of form in those tropical lands where moisture combines with heat in covering the ground with a dense and everlasting vegetation. Our largest insects are indeed mere pygmies when compared with their tropical relatives. We have no tiger-beetle to equal the ferocious *Mantichora* of South Africa, which, hiding beneath stones from the terrible glare of the sun, darts quickly from its place of concealment upon its ill-fated prey; nor a stag-beetle of the size of the *Odontolabris Cuvra* of China and Northern India. Our largest dung-feeding *Lamellicorns* look but small near the African *Copris Hamadryas*; and our cockchafer, though conspicuous among our native insects, is a dwarf when confronted

with the *Leucopholis bimaculata* of India, which, if it be voracious in proportion to its size, must destroy a vast amount



ODONTOLABRIS CUVERA.

of vegetation in the course of its long larval existence. The Goliath beetles of the coast of Guinea, are truly deserving of



COPRIS HAMADRYAS.

their name, and in torrid America the colossal Hercules beetle attains a length of five, or even six inches. Though but little is yet known of its economy, it most likely subsists upon putrescent wood, and evidently leads a tree life, like its relations—the Elephant, the Neptune, the Typhon, the Hector.

and the Mars beetles—whose very names indicate that they are ‘first-rate liners’ in the insect world. All these beetles excavate burrows in the earth, where they conceal themselves during the day, or live in the decomposed trunks of trees, and are generally of a dark rich brown or chestnut colour. On the approach of night they run about the footpaths in woods, or fly around the trees to a great height with a loud humming noise. Resembling the large herbivorous quadrupeds by their comparative size and horn-like processes, they are still further like them in their harmless nature, and thus deserve in more than one respect to be called the elephants among the insect tribes.



LEUCOPHOLIS BIMACULATA.

Many of the tropical dragon-flies, grasshoppers, butterflies, and moths are of no less colossal dimensions in their several orders than the giants among the beetles. The *Libellula lucretia*, a South American dragon-fly, measures five inches and a half in length, and the cinnamon-eating Atlas-moth of Ceylon often reaches the dimensions of nearly a foot in the stretch of its superior wings. The names of many other species conspicuous by their size might be added; but these examples suffice to show the enormous proportions attained by insects in the warmer regions of the globe.

In the tropical zone, where the prodigality of life multiplies

the enemies which every creature has to encounter, we may naturally expect to find the insects extremely well provided with both passive and active means of defence.

Many so closely resemble in colour the soil or object on which they are generally found, as to escape even the eye of a hungry enemy. The wings of several Brazilian moths appear like withered leaves that have been gnawed round their margins by insects; and when these moths are disturbed, instead of flying away, they fall upon the ground like the leaf which they resemble, so that it is difficult, if not impossible, on such occasions to know what they really are.

The illusion is still more complete when the likeness of form is joined to that of colour, as in the walking-leaf and walking-stick insects. Some, of an enormous length, look so exactly like slender dead twigs covered with bark, that their insect nature can only be discovered by mere accident—upon being handled they feign death, and their legs are often knobbed, like the withered buds of trees; some resemble living twigs, and are green; others such as are decayed, and are therefore coloured



PHYLLIUM.

brown; the wings of many put on the resemblance of dry and crumpled leaves, while those of others are vivid green—in exact accordance with the plants they respectively inhabit. This highly remarkable family consists of the herbivorous Phasmas and Phylliums—the former of which have a thin twig-like shape, while the latter have an enlarged body—and of the carnivorous Mantides, or soothsayers. As the Mantis is slow and without much muscular energy, and its organisation requires a large supply of food, Nature has disguised it under the form of a plant, the better to deceive its victims. Like a cat approaching a mouse, it moves almost imperceptibly along, and steals towards its prey, fearful of putting it to flight. When sufficiently near, the fore legs are suddenly darted out to their full length, and seize the doomed insect, which vainly endeavours to extricate itself; the formation of the fore leg enabling the tibia to be so closed on the sharp edge of the thigh as to amputate any slender substance brought within its

grasp, and to make even an entomologist repent a too hasty seizure of his prize.

The Mantis, by the attitude it assumes when lurking for its prey or advancing upon it—which is done by the support of the four posterior legs only, whilst the head and prothorax are raised perpendicularly from the body, and the anterior legs are folded in front—greatly resembles a person praying. Hence, in France it is called *Le Prêcheur*, or *Le Prie Dieu*; the Turk says it points to Mecca; and several African tribes pay it religious observances. In reality, however, its ferocity is great, and the stronger preying on the weaker of their own species, unmercifully cut them to pieces.

Within the space of a week, Professor Burmeister saw a Mantis devour daily some dozens of flies, and occasionally large grasshoppers and young frogs, consuming, now and then, lizards three times its own length, as well as many large fat caterpillars. Hence it may be judged what ravages these strangely-formed creatures must cause among all weaker beings which incautiously approach them, and that, far from being the saints, they are, in reality, the tigers of the insect world. Among the organic marvels of the innocent herbivorous Phylliums, their seed-like eggs must be mentioned; for the wonderful provision of Nature in giving the parents a plant-like form extends even to their progeny, in order to secure them from similar dangers. Though generally tropical, yet Van Diemen's Land possesses a gigantic walking-stick, or *Phasma*, the body of which is eight inches long; and the *Mantis religiosa* is found all over Southern Europe.



MANTIS.

The leaf-like form which renders the Phylliums one of the wonders of entomology, appears likewise in other insects. Thus, in the *Diactor bilineatus*, a native of Brazil, the hind legs have singular leaf-like appendages to their tibial joints; and in the *Javanese Mormolyce*, a beetle remarkable for its extreme flatness and the elongation of its head, we find the upper wings spreading out in the form of broad leaves.

The long hairs, stiff bristles, sharp spines, and hard tubercular prominences with which many caterpillars are bristled

and studded, are a most effectual means of defence, and often prove a grievous annoyance to the entomologist, from their



JAVANESE MORMOLYCE.

poisonous or stinging properties. Mr. Swainson once finding in Brazil a caterpillar of a beautiful black colour, with yellow radiated spines, and being anxious to secure the prize, incautiously took hold of it with the naked hand; but so instantaneous and so violent was the pain which followed, that he was obliged to return home. Every device that could be thought of to allay the itching produced by the venomous hairs of this

creature were in turn resorted to, with little or no effect for several hours, nor had it entirely ceased on the following morning.

Though the great majority of luminous animals are marine, frequently lighting up the breaking wave with millions of moving atoms, or spreading over the beach like a sheet of fire,\* yet several insects are also endowed with the same wonderful property. The European glow-worms and fire-flies, sparkling on the hedge-rows, or flying in the summer air, afford a charming spectacle; but their brilliancy is far surpassed by that of the phosphorescent beetles of the torrid zone. Thus the Cocujas of South America, which emits its light from two little transparent tubercles on the sides of the thorax, glows



COCUJAS.

with such intensity that a person may with great ease read the smallest print by the phosphorescence of one of these insects, if held between the fingers and gradually moved along the lines with the luminous spots above the letters; but if eight or ten of them are put into a phial the light will be sufficiently good to admit of writing by it.

The Indian Archipelago is equally rich in luminous insects. The Podada tree, the ornament of most of the river banks of Borneo, has a remarkably elegant foliage of a light green colour. Rajah Brooke † describes these trees illuminated by the fire-flies

\* 'The Sea and its Living Wonders,' ch. xx.

† 'Narrative of Events in Borneo and Celebes,' London 1848, vol. i. p. 214.

in countless numbers as a most enchanting sight, and resembling a fire-work by the constant motion of the light. On the Samarahan he sometimes saw each side of the river lit by a blaze of these beautiful little insects.

In the woods of Sarawak Mr. Adams observed a splendid glow-worm (*Lampyrus*), each segment of the body illuminated with three lines of tiny lamps, the luminous spots on the back being situated at the posterior part of the segmentary rings on the median line, while those along the sides of the animal were placed immediately below the stomates or spiracula, each spiraculum having one bright spot. This very beautiful insect was found shining as the darkness was coming on, crawling on the narrow pathway, and glowing among the dead damp wood and rotten leaves. When placed around the finger, it resembled in beauty and brilliancy a superb diamond ring.

The sparkling effulgence of the tropical Elaters is frequently made use of by the fair sex, as an equally singular and striking ornament. The ladies of the Havana attach them to their clothes on occasions of festivity, and the Indian dancing girls often wear them in their hair.

In Prescott's 'Conquest of Mexico' we are told that, in 1520, when the Spaniards visited that country, the wandering sparks of the Elater, 'seen in the darkness of the night, were converted by their excited imaginations into an army with matchlocks;' and on another occasion these phosphorescent insects caused British troops to retreat: for when Sir John Cavendish and Sir Robert Dudley first landed in the West Indies, and saw at night an innumerable quantity of lights moving about, they fancied that the Spaniards were approaching with an overwhelming force, and hastily re-embarked before their imaginary foe.

A creature, half of whose body is generally fixed to the other by a mere thread, whose soft skin is unable to resist the least pressure, and whose limbs are so loosely attached to the body as to be torn off by the slightest degree of force, would seem utterly incapable of protecting its own life and securing that of its progeny. Such, however, is the physical condition of the spiders, who would long since have been extirpated if Nature had not provided them with the power of secreting two

liquids, the one a venom ejected by their mandibles, the other of a glutinous nature, transuded by papillæ at the end of their abdomen. These two liquids amply supply the want of all other weapons of attack or defence, and enable them to hold their own against a host of enemies. With the former they instantly paralyse insects much stronger and much more formidable in appearance than themselves; while with the latter they spin those threads which serve them in so many ways—to weave their wonderful webs, to traverse the air, to mount vertically, to drop uninjured, to construct the hard cocoons intended to protect their eggs against their numberless enemies, or to produce the soft down which is to preserve them from the cold.

Preying on other insect tribes, which they attack with the ferocity of the tiger, or await in their snares with the patient artifice of the lynx, the spiders may naturally be expected to be most numerous in the torrid zone, where Nature has provided them with the greatest abundance and variety of food. There also, where so many beetles, flies, and moths attain a size unknown in temperate regions, we find the spiders growing to similar gigantic dimensions, and forming webs proportioned to the bulk of the victims which they are intended to ensnare.

In some parts of Makalolo, Dr. Livingstone saw great numbers of a large beautiful yellow-spotted spider, the webs of which were about a yard in diameter. The lines on which these webs were spun, extended from one tree to another, and were as thick as coarse thread. The fibres radiated from a central point, where the insect waited for its prey. The webs were placed perpendicularly, and a common occurrence in walking was to get the face enveloped in them, as a lady is in a veil.

By means of their monstrous webs many giant-spiders of the tropical zone are enabled to entangle not only the largest butterflies and moths, but even small birds. Some Mexican species extend such strong nets across the pathways, that they strike off the hat of the passer-by; in Senegal spiders spin threads so strong as to be able to bear a weight of several ounces, and in the forests of Java, Sir George Staunton saw spider-webs of so strong a texture that it required a sharp knife to cut one's way through them; and many other similar examples might be mentioned.

These large spiders so temptingly suspended in mid-air in the forest glades, seem very much exposed to the attacks of birds, but in many cases it has pleased Nature to invest them with large angular spines sticking out of their bodies in every kind of fashion. Some are so protected by these long prickles that their bodies resemble a miniature 'chevaux de frise,' and could not by any possibility be swallowed by a bird without producing a very unpleasant sensation in his throat. One very remarkable species (*Gasteracantha arcuata*) has two enormous recurved conical spines, proceeding upwards from the posterior part of the body, and several times longer than the entire spider.

Other Araneæ, to whom these means of defence have been denied, are enabled by their colour to escape the attacks of many enemies, or to deceive the vigilance of many of their victims. Thus, those that spend their lives among the flowers and foliage of the trees are, in general, delicately and beautifully marked with green, orange, black, and yellow, while those which frequent gloomy places are clothed with a dark-coloured and dingy garb, in accordance with their habits. In the forests about Calderas, in the Philippine Archipelago, Mr. Adams saw handsomely coloured species of *Theridia* crouching among the foliage of the trees: while numbers of the same genus of a black colour were running actively about among the dry dead leaves that strewed the ground, looking, at a little distance, like odd-shaped ants, and no doubt deceiving many an antagonist by this appearance. One species, which knew it was being watched, placed itself upon a diseased leaf, where it remained quite stationary until after the departure of the naturalist, who, had he not seen the sidelong movement of the cunning little creature in the first instance, would not have been able to distinguish its body from the surface of the leaf. While, in this case, dulness of colour served as a defence, the vividly-coloured spiders that live among the foliage and flowers no doubt attract many flies and insects by reason of their gaudily-tinted bodies.

One of the most remarkable instances of the harmony of colour between the Araneæ and their usual haunts was noticed by Mr. Adams among dense thickets formed by the *Abrus precatoria*, where he found a spider with a black abdomen marked

on each side with scarlet, thus resembling the colours of the seeds of the *Abrus*, so well known to children under the name of 'black-a-moor beauties.'

An exception to the general rule is, however, found in those very large and powerful species which, if not rendered somewhat conspicuous to the sight of other insects, might do too much damage to the tribes which they keep in check. Most of these, therefore, have the thorax and abdomen margined with a light colour that contrasts strongly with that of their bodies, and, in many cases, gives timely warning of their approach.

The European spiders have generally a very repulsive appearance, while many of the tropical species are most splendidly ornamented, or rather illuminated, many of them by the vividness of their colours resembling the gaudy missals painted by monks in the Middle Ages. Thus, among the *Epeiras* of the Philippine Islands, are found white figures on a red ground; red, yellow, and black, in alternate streaks; orange marbled with brown, light green with white ocelli, yellow with light brown festoons, or ash-coloured and chestnut bodies with crescents, horse-shoes, Chinese characters; and grotesque hieroglyphics of every description. Unfortunately, these colours, lustrous and metallic as the feathers of the humming-bird, are, unlike the bright colours of the beetle, totally dependent on the life of the insect which they beautify, so that it is impossible to preserve them.

While most spiders obtain their food either by patiently waiting in ambush or by catching it with a bound, the enormous mygales, or trap-door spiders, run about with great speed in and out, behind and around every object, searching for what they may devour, and from their size and rapid motions exciting the horror of every stranger. Their body, which sometimes attains a length of three inches, while their legs embrace a circle of half a foot in diameter, is covered all over with brown, reddish brown, or black hair, which gives them a funereal appearance, while their long fangs armed with sharp hooks proclaim at once what formidable antagonists they must be to every insect that comes within their reach. Though some species are found in Southern Europe, in Chili, or at the Cape, yet they are chiefly inhabitants of the torrid zone, both in the old

and the new world. Some of them weave cells between the leaves, in the hollows of trees or rocks, while others dig deep tubular holes in the earth, which they cover over with a lid, or rather with a door formed of particles of earth cemented by silken fibres, and closely resembling the surrounding ground. This door or valve is united by a single hinge to the entrance at its upper side, and is so balanced that, when pushed up, it shuts again by its own weight; nay, what is still more admirable, on the interior side opposite to the hinge a series of little holes may be perceived, into which the mygale introduces its claws to keep it shut, should any enemy endeavour to open it by force. The interior of the nest, which is sometimes nine inches deep, is lined with a double coat of tapestry, the one nearest the wall, which is of a coarser tissue, being covered with a pure white silken substance like paper.

New-comers into the country which the trap-door spider inhabits, are often as surprised as Ali Baba in the 'Forty Thieves' by seeing the ground open, a little lid lifted up, and a grim black-haired spider peer about as if to reconnoitre the position before sallying out of its fortress. At the least movement on the part of the spectator, down drops the spider disappearing into its hole, the door closes and the astonished observer, unable to find its traces in the apparently unbroken soil doubts whether his eyes have not deceived him. Nothing short of actual violence will induce the trap-door spider to vacate the premises it has so admirably constructed. It holds on with all its might and will permit the earth to be excavated around its burrow and the whole nest to be removed without deserting its home. But all its energy vanishes as soon as it is removed from the burrow it so pertinaciously defended; it then loses all its activity, remains fixed to the spot as if stupified, or at the best walks languidly about like one who has lost all that made existence valuable.

At Caldera, Mr. Adams observed a dingy little species of spider of the genus *Clubiona*, concealing itself in very snug retreats formed out of a dead leaf, rolled round in the shape of a cylinder, lined with a soft silken tissue, and closed at one end by means of a strong woven bolt-door. When hunted, it was amusing to see the frightened little creatures run for protection into their tiny castles, where they would doubtless

be safe from the attacks of birds, owing to the leaves not being distinguishable from others that strew the ground.

All species of spiders are gifted with an admirable maternal instinct, and resort to various methods for the purpose of securing their cocoons. The Theridion, when a seizure of the precious burden is threatened, tumbles together with it to the ground, and remains motionless, while the Thorinsa covers it with its body, and when robbed of it, wanders about disconsolate. In a forest of the Sooloo Islands, Mr. Adams found the ground literally overrun with a small black agile species of *Lycosa*, many of which had a white flattened globose cocoon affixed to the end of their abdomen. It was most amusing to watch the care with which these jealous mothers protected the cradles of their little ones, allowing themselves to fall into the hands of the enemy rather than be robbed of the silken nests that contained them.

If the spiders are at war with all other insects, and contribute to keep them within bounds by the destruction they cause among their ranks, they in their turn are sorely persecuted creatures. Monkeys, squirrels, lizards, tortoises, frogs, and toads catch and devour them wherever they can. In Java and Sumatra, we even find a family of sparrows named *Arachnothera*, from their living almost exclusively on spiders. Armed with a prodigiously long recurved and slender beak, these birds know how to pursue them and drag them forth from the most obscure recesses.

It is amongst the insects, however, that the spiders have to fear their most numerous and formidable enemies. Independently of those which they find in their own class, the centipedes seize them beyond the possibility of escape; and several species of wasps, more savage and poisonous than themselves, will rush upon spiders eight times their size and weight, and benumbing them with a sting, bear them off to their nests, to serve as food for their larvæ.

Others attack the spiders in their progeny. The *Pimpla Arachnitor* pierces with its invisible gimlet the tender skin of the spider's egg, and, without tearing it, introduces its own eggs into the liquid. The pimpla's egg soon comes to maturity, and the larva devours the substance of that of the spider, from whence a winged insect bursts forth—a phenomenon which made some naturalists, too hasty to judge from

appearances, believe that spiders were able to procreate four winged flies.

Notwithstanding the disgust or horror which they generally inspire, the spiders are, with very rare exceptions, by no means injurious to man. However promptly their venom may act upon insects, even that of the largest species of Northern Europe produces, on coming into contact with our skin, no pain or inflammation equalling in virulence that of the wasp, the bee, the gnat, or other insects of a still smaller size. The giant spiders of a sunnier sky, armed with more formidable weapons, naturally produce a more painful sting; but even here the effects have been much exaggerated.

In the country of the Makalolo, Dr. Livingstone, feeling something running across his forehead as he was falling asleep, put up his hand to wipe it off, and was sharply stung, both on the hand and head; the pain was very acute. On obtaining a light, he found that it had been inflicted by a light-coloured spider about half an inch in length; but one of the negroes having crushed it with his fingers, he had no opportunity of examining whether the pain had been produced by poison from a sting, or from its mandibles. No remedy was applied, and the pain ceased in about two hours.

If thus, among the many species of spiders, hardly a single one may be said to be formidable to man, the indirect services which they render him—by diminishing the number of noxious insects—are far from inconsiderable.

In several countries where insects cause great ravages, the services of the spiders are duly appreciated. Thus in the West Indies, a large and formidable trap-door spider, which would make a European start back with horror, is looked upon with pleasure by the islanders of the torrid zone, who respect it as a sacred animal, by no means to be disturbed or harmed, as it delivers them from the cockroaches, which otherwise would overrun their dwellings. Those who do not possess these spiders take good care to purchase and transport them into their houses, expecting from them similar services to those we derive from a good domestic cat. The spectacle of a trap-door spider bounding on a cockroach, with all the ferocity of a tiger springing on its prey, would no doubt have all the interest of a bull-fight if the diminutive size of the combatants were swelled

to more ample proportions. Mr. E. Layard has described one of these encounters which he witnessed near a ruined temple in Ceylon. When about a yard apart, each of the enemies discerned the other and stood still, the spider with his legs slightly bent and his body raised, the cockroach confronting him, and directing his antennæ with a restless undulation towards his enemy. The spider, by stealthy movements, approached to within a few inches, and paused, both parties eyeing each other intently; then suddenly a rush, a scuffle, and both fell to the ground, when the blatta's wings closed; the spider seized it under the throat with his claws, and when he had dragged it into a corner, the action of his jaws was distinctly audible. Next morning, Mr. Layard found the soft parts of the body had been eaten, nothing but the head, thorax, and elytra remaining.

The scorpions, which even in Europe are reckoned among the most malignant insects, are truly terrific in the torrid zone, where they frequently attain a length of six or seven inches. Closely allied to the spiders, their aspect is still more repulsive. Were one of the largest scorpions menacingly to creep up against you, with extended claws and its long articulated sharply-pointed tail projecting over its head, I think, despite the strength of your nerves, you would start back, justly concluding that a creature of such an aspect must necessarily come with the worst intentions. The poison of the scorpion is discharged like that of the snake. Near the tip of the crooked sting, namely, which terminates the tail, we find two or three



SCORPION.

very small openings, through which, on pressure, the venom of the gland with which they are connected immediately issues forth. By means of this weapon, even the small European scorpions are able to kill a dog, while the tropical giants of the race inflict wounds that become fatal to man himself. The sting of several South American scorpions produces fever, numbness of the limbs, tumours on the tongue, weakness of the sight, and other nervous symptoms, lasting twenty-four or forty-eight hours; but the African scorpions seem to be still more formidable. Mr. Swainson informs us that the only means of saving the lives of our

soldiers who were stung by those of Egypt, was the amputation of the wounded limb; and Professor Ehrenberg, who, while making his researches on the Natural History of the Red Sea, was stung five times by the *Androctonus quinquestriatus*, and *funestus*, says he can well believe, from the dreadful pains he suffered, that the poison of these scorpions may become fatal to women and children.

Scorpions, being intolerant of light, creep by day into every hole or corner that can shelter them from the unwelcome sunbeams, and often cause very great annoyance by this custom. No traveller in a scorpion-infested country who has learnt by experience the habits and dangerous character of these creatures will retire to rest before having carefully examined his bed, especially taking up the pillow, to ascertain that no enemy is lurking within the folds of the bedding. Shoes, boots, and gloves are also favourite resorts of the scorpion, a circumstance which has caused many a serious accident.

The burrows of this formidable animal can always be detected by the semilunar form of the entrance, exactly fitting the outline of the animal which digs it. To force them to quit the premises nothing more is required than to pour in some water, when the disturbed inmate rushes furiously out, his pincers snapping wildly at the enemy.

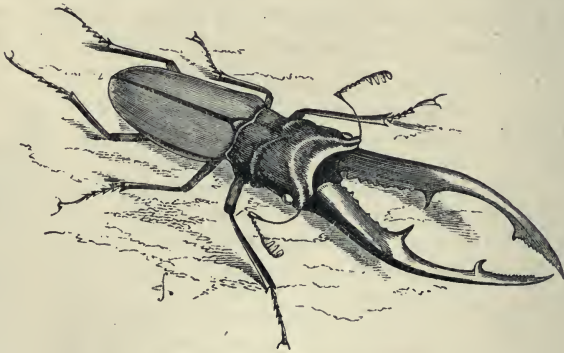
The suicidal propensities of the scorpion, when, inclosed by a fiery circle, it finds escape impossible, have been often mentioned in prose and poetry, and form among others the subject of a beautiful simile in Byron's 'Giaour':—

The Mind, that broods o'er guilty woes,  
 Is like the scorpion girt by fire,  
 In circle narrowing as it glows,  
 The flames around their captive close,  
 Till, inly searched by thousand throes,  
 And maddening in her ire,  
 One sad and sole relief she knows,  
 The sting she nourish'd for her foes,  
 Whose venom never yet was vain,  
 Gives but one pang, and cures all pain,  
 And darts into her desperate brain:  
 So do the dark in soul expire,  
 Or live like scorpion girt by fire.

The voluntary death of the animal is doubted by many, who maintain that the position of the sting when turned towards

the head, is merely a convulsive movement; but the opinion of those who are inclined to bring in the verdict 'Felo de se' is corroborated by Captain Pasley, R.A., who repeatedly tried the experiment of surrounding the scorpion with a ring of fire, and invariably found that it had stung itself to death. The fiery circle was about fifteen inches in diameter and composed of smouldering ashes. In every instance the scorpion ran about for some minutes, trying to escape, and then deliberately bent its tail over its back, inserted the point of its sting between two of the segments of his body and speedily died. The heat given out by the ashes was very trifling and not equal to that which is caused by the noontide sun, a temperature which the scorpion certainly does not like, but which it can endure without suffering much inconvenience. Generally the scorpion was dead in a few minutes after the wound was inflicted.

Of a ferocious cruel disposition, the scorpions are not only the foes of all other animals, but carry on a war of extermination among themselves, and are even said to kill and devour their own progeny, without pity, as soon as they are born; thus rendering good service to the community at large. Maupertuis once inclosed a hundred scorpions—a select and delightful party—in a box. Immediately a furious battle ensued—one against all, all against one—and in an hour's time scarcely one of the combatants survived the conflict.



CYCLOMMATUS TARANDUS (BORNEO).



ANTS AND TERMITES.

## CHAPTER XIX.

### INSECT PLAGUES AND INSECT SERVICES.

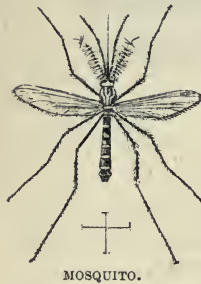
The Universal Dominion of Insects — Mosquitoes — Stinging Flies — *Æstrus Hominis*—The Chegoe or Jigger—The *Filaria Medinensis*—The Bête-Rouge—Blood-sucking Ticks—Garapatas—The Land-licees in Ceylon—The Tsetsé Fly—The Tsalt-Salya—The Locust—Its dreadful Devastations—Cockroaches—The Drummer—The Cucarachas and Chilicabras—Tropical Ants—The Saüba—The Driver Ants—Termites—Their wonderful Buildings—The Silkworm—The Cochineal—The Gumlac Insect—Insects used as Food and Ornaments. .

THE insect tribes may, without exaggeration, be affirmed to hold a kind of universal empire over the earth and its inhabitants, for nothing that possesses, or has possessed, life is secure from their attacks. They vanquish the cunning of the fox, the bulk of the elephant, the strength of the lion; they plague the reindeer of the northern tundras, and the antelope of the African wilds; and all the weapons with which Nature has furnished the higher orders of animals against their mightier foes prove ineffectual against these puny persecutors, whose very smallness serves to render them invincible. How numerous are the sufferings they entail on man! how manifold the injuries they inflict on his person or his property! To secure himself from their attacks, a perpetual warfare, an ever-

wakeful vigilance, is necessary; for, though destroyed by thousands, new legions ever make their appearance, and to repose after a victory is equivalent to a defeat.

In our temperate zone, where a higher cultivation of the ground tends to keep down the number of the lower animals, their persecutions, though frequently annoying, may still be borne with patience; but in many of the tropical regions, where man is either too indolent or not sufficiently numerous to set bounds to their increase, the insects constitute one of the great plagues of life.

Along the low river-banks, near stagnant waters, and everywhere on hot and swampy grounds, the blood-thirsty Mosquitoes appear periodically in countless multitudes, the dread of all who are exposed to their attacks.



Not satisfied with piercing the flesh with their sharp proboscis, which at the same time forms a kind of syphon through which the blood flows, these malignant gnats, of which there are many species, inject a poison into the wound, which causes inflammation, and prolongs the pain.

In Angola, Dr. Livingstone found the banks of the river Seuza infested by legions of the most ferocious mosquitoes he ever met with during the course of his long travels. 'Not one of our party could get a snatch of sleep. I was taken into the house of a Portuguese, but was soon glad to make my escape, and lie across the path on the lee-side of the fire, where the smoke blew over my body. My host wondered at my want of taste, and I at his want of feeling; for, to our astonishment, he and the other inhabitants had actually become used to what was at least equal to a nail through the heel of one's boot, or the tooth-ache.'

'He who has never sailed on one of the great rivers of tropical America, the Orinoco, or the Magdalena,' says Humboldt, 'can form no idea of the torments inflicted by the mosquitoes. However accustomed the naturalist may be to suffer pain without complaining, however his attention may be riveted by the examination of some interesting object, he is unavoidably disturbed when Mosquitoes, Zancudos, Zejens, and Tempraneros cover his

hands and face, pierce his clothes, or creep into his nose and mouth. In the missions of the Orinoco, in these small villages, situated on the river banks and surrounded by interminable woods, this plague affords an inexhaustible subject for conversation. When two people meet in the morning their first questions are—‘How did the Zancudos behave last night?’ ‘How are the mosquitoes to-day?’

At the mouth of the Red River the unfortunate inhabitants lay down at night upon the ground, and cover themselves with three or four inches of sand, so that only the head remains free, over which they spread a protecting cloth. Above the influx of the Rio Arauca into the Orinoco, at the cataracts of Baragnon, the atmosphere up to a height of 15 or 21 feet, is filled with a dense mist of stinging insects. Placing oneself in some dark spot, for instance in one of the deep hollows formed in the cataracts by mounds of granitic blocks and looking towards the opening illumined by the sun, one sees whole clouds of mosquitoes, increasing or diminishing in density as the creatures in their slow and rhythmic motions now draw more closely together, and then again separate. In Esmeralda, at the eastern extremity of the Upper Orinoco, the mosquito clouds are almost as thick as at the cataracts. When the superior of the monastic order to which the mission belongs, wishes to punish a lay brother, he sends him to Esmeralda, or, as the monks facetiously remark, ‘condemns him to the mosquitoes.’

It is a well-known fact that the various species of gnats or flies comprehended under this general name, do not associate, but appear at different times of the day. As often as the scene changes or as ‘other insects mount guard,’ one enjoys a few minutes’ rest; for after the retreat of one host, its successors are not immediately on the spot. From half-past six in the morning till five in the afternoon the air is filled with mosquitoes of the genus *Simulium*. An hour before sunset, these are replaced by a small species of *Culex* called the *Tempraneros* or early-risers, as they also show themselves at sunrise. Their stay in the afternoon scarcely lasts an hour and a half, and then one feels soon after the painful sting of a larger *Culex*—the *Zancudo*—who, plunging his blood-thirsty proboscis into the skin, causes an excruciating pain. The *Zancudo*, a

‘child of the night,’ disappears at sunrise, and then makes place for the matutinal *Tempranero*. As all these winged tormentors spend the greater part of their lives in the water, we cannot wonder that their numbers diminish as the distance from the banks of the rivers intersecting the forests increases. Their favourite resorts are the places where their transformation takes place, and where they on their part are soon about to lay their eggs. The mosquito clouds hover only above or near the waters, and it would be a great error to suppose that the vast forests extending between the river valleys are all equally infested with this insect plague.

From time to time the mosquitoes migrate like the social stentor monkeys. Formerly no other *Culex* was known at Simiti on the Magdalen river but the small species called Zejen. The people slept unmolested, for the Zejen is a diurnal insect. But in 1801 the great blue-winged *Zancudo* made his appearance in such numbers that the poor inhabitants of Simiti could find no rest at night.

Slight differences of climate or food seem to have an influence on the intensity of the poison which the same species discharges through its serrated proboscis. One cannot refrain from smiling at the disputes of the missionaries about the size and voracity of the mosquitoes in different parts of the same river. In a land so completely severed from the rest of the world, this forms the favourite subject for conversation. ‘How much I pity you,’ said the missionary from the falls as he took leave of his colleague at the Cassiquiare; ‘you are like me, alone in this land of jaguars and monkeys, but as to my mosquitoes I can boast that one of mine is a match for three of yours.’

This unequal voracity of the insects in different places, this various intensity of poison in the same species, are very remarkable, but similar phenomena are met with in the classes of the large animals. In *Angostura* the crocodile attacks man, while in *New Barcelona* people bathe in his presence without fear. The jaguars on the isthmus of *Panama* are cowardly when compared with those of the *Upper Orinoco*; and the Indians know very well that the monkeys from one part of the country can easily be tamed, while individuals of the same species caught elsewhere will rather die of hunger than submit to captivity.’

Whoever has sojourned in a mosquito land knows that there is no radical remedy against them. The Indians who besmear their body with arnatto or turtle fat, slap every moment with their flat hands on their shoulders, back, and legs as often as if they were not painted at all. On the banks of the Amazons the people use cow-dung burnt at their doors, to keep away the praya or plague, as they very justly term the mosquitoes. In the evening every house and cottage has its pan of dung smouldering in the verandah and emitting rather an agreeable odour—but where the insects are very numerous and blood-thirsty this fumigation also is of no avail.

Not content with a passing attack, a South American gad-fly (*Æstrus hominis*) deposits its eggs under the human skin, where the larvæ continue for six months. If disturbed, they penetrate deeper, and produce troublesome ulcers, which sometimes even prove fatal. Thus, in tropical America, we find the same insect tribe which plagues our oxen and horses, and reduces the northern reindeer to desperation, settle on man himself, and render even the lord of creation subject to its power.

The Chegoe, Pique, or Jigger of the West Indies (*Pulex penetrans*) is another great torment of the hot countries of America.

It looks exactly like a small flea, and a stranger would take it for one. However, in about four and twenty hours he would have several broad hints that he had made a mistake in his ideas of the animal. Without any respect for colour, it attacks different parts of the body, but chiefly the feet, betwixt the toe-nails and the flesh. There it buries itself and causes an itching, which at first is not unpleasant, but after a few days gradually increases to a violent pain. At the same time a small white tumour, about the size of a pea, and with a dark spot in the centre, rises under the skin. The tumour is the rapidly growing nest of the chegoe, the spot the little plague itself. And now it is high time to think of its extirpation, an operation in which the negro women are very expert. Gently removing with a pin the skin from the little round white ball or nest, precisely as we should peel an orange, and pressing the flesh all round, they generally succeed in squeezing it out without breaking, and then fill the cavity with snuff or tobacco, to guard against the possibility of a fresh colony being formed by

some of the eggs remaining in the wound. New comers are particularly subject to these creatures. Waterton, who by practice appears to have become very expert in eradicating chegoes' nests, once took four out of his feet in the course of the day, and a negress extracted no less than eighty-three out of Richard Schomburgk's toes in one sitting. 'Every evening,' says the venerable naturalist of Walton Hall, 'before sundown, it was part of my toilet to examine my feet and see that they were clear of chegoes. Now and then a nest would escape the scrutiny, and then I had to smart for it a day or two after. A chegoe once lit upon the back of my hand: wishful to see how he worked, I allowed him to take possession. He immediately set to work head foremost, and in about half an hour he had completely buried himself in the skin. I then let him feel the point of my knife, and exterminated him.'

If the prompt extraction of the chegoes' nests is neglected, the worm-like larvæ creep out, continue the mining operations of their parent, and produce a violent inflammation, which may end in the mortification of a limb. It not unfrequently happens that negroes from sheer idleness or negligence in the first instance have been lamed for life and become loathsome to the sight. In such a state, these miserable objects are incurable, and death only puts an end to their sufferings.

A still more dangerous plague, peculiar to the coast of Guinea and the interior of tropical Africa, to Arabia, and the adjacent countries, is the *Filaria medinensis* of Linnaeus. This dreaded worm comes to the herbage in the morning dew, from whence it pierces the skin, and enters the feet of such as walk without shoes, causing the most painful irritation, succeeded by violent inflammation and fever. The natives extract it with the greatest caution by twisting a piece of silk round one extremity of the body and withdrawing it very gently. When we consider that this insidious worm is frequently twelve feet long, although not thicker than a horse-hair, we can readily imagine the difficulty of the operation. If unfortunately the animal should break, the part remaining under the skin grows with redoubled vigour, and frequently occasions a fatal inflammation.

One of these most unwelcome intruders once entered Dampier's ankle. 'I was in great torment,' says this enter-

taining traveller, 'before it came out. My leg and ankle swelled, and looked very angry, and I kept on a plaster to bring it to a head. At last, drawing off my plaster, out came three inches of the worm, and my pain abated. Till that time I was ignorant of my malady, and a gentleman at whose house I was took it for a nerve; but I knew well what it was, and presently rolled it up on a small stick. After this I opened the place every morning and evening, and strained the worm out gently, about two inches at a time—not without some pain—till I had at length got it out.'

Among the plagues of Guiana and the West Indies we must not forget a little insect in the grass and on the shrubs, which the French call *bête-rouge*. It is of a beautiful scarlet colour, and so minute that you must bring your eye close to it before you can perceive it. It abounds most in the rainy season. Its bite causes an intolerable itching, which, according to Richard Schomburgk, who writes from personal experience, drives by day the perspiration of anguish from every pore, and at night makes one's hammock resemble the gridiron on which Saint Lawrence was roasted. The best way to get rid of the plague is to rub the part affected with lemon-juice or rum. 'You must be careful not to scratch it,' says Waterton. 'If you do so and break the skin, you expose yourself to a sore. The first year I was in Guiana the *bête-rouge* and my own want of knowledge, and, I may add, the little attention I paid to it, created an ulcer above the ankle which annoyed me for six months, and if I hobbled out into the grass, a number of *bête-rouges* would settle on the edges of the sore and increase the inflammation.'

The blood-sucking Ticks are also to be classed among the intolerable nuisances of many tropical regions. A large American species called *Garapata* (*Ixodes sanguisuga*) fixes on the legs of travellers, and gradually buries its whole head in the skin, which the body, disgustingly distended with blood, is unable to follow. On being violently removed, the former remains in the wound, and often produces painful sores. The Indians returning in the evening from the forest or from their field labour generally bring some of these creatures along with them, swollen to the size of hazel-nuts.

Though countless hosts of ticks infest the Ceylonese jungle, though mosquitoes without number swarm over the lower

country, yet the land-leeches which beset the traveller in the rising grounds are a still more detested plague. 'They are not frequent in the plains,' says Sir E. Tennent, 'which are too hot and dry for them; but amongst the rank vegetation in the lower ranges of the hill-country, which is kept damp by frequent showers, they are found in tormenting profusion. They are terrestrial, never visiting ponds or streams. In size they are about an inch in length, and as fine as a common knitting needle, but capable of distention till they equal a quill in thickness and attain a length of nearly two inches. Their structure is so flexible that they can insinuate themselves through the meshes of the finest stocking, not only seizing on the feet and ankles, but ascending to the back and throat, and fastening on the tenderest parts of the body. The coffee planters who live amongst these pests are obliged in order to exclude them, to envelope their legs in "leech gaiters," made of closely woven cloth.

'In moving, the land-leeches have the power of planting one extremity on the earth and raising the other perpendicularly to watch for their victim. Such is their vigilance and instinct that, on the approach of a passer-by to a spot which they infest, they may be seen amongst the grass and fallen leaves, on the edge of a native path, poised erect, and preparing for their attack on man and horse. On descrying their prey they advance rapidly by semicircular strides, fixing one end firmly and arching the other forwards, till by successive advances they can lay hold of the traveller's foot, when they disengage themselves from the ground and ascend his dress in search of an aperture to enter. In these encounters the individuals in the rear of a party of travellers in the jungle invariably fare worst, as the leeches once warned of their approach congregate with singular celerity. Their size is so insignificant, and the wound they make so skilfully punctured, that the first intimation of their onslaught is the trickling of the blood, or a chill feeling of the leech when it begins to hang heavily on the skin from being distended by its repast. Horses are driven wild by them, and stamp the ground in fury to shake them from their fetlocks, to which they hang in bloody tassels. The bare legs of the palankin-bearers and coolies are a favourite resort, and their hands being too much engaged to

be spared to pull them off, the leeches hang like bunches of grapes round their ankles ; and I have seen the blood literally flowing over the edge of a European's shoe from their innumerable bites. In healthy constitutions the wounds, if not irritated, generally heal, occasioning no other inconvenience than a slight inflammation and itching ; but in those with a bad state of body, the punctures, if rubbed, are liable to degenerate into ulcers, which may lead to the loss of limb or of life. Both Marshall and Davy mention that, during the march of the troops in the mountains, when the Kandyan were in rebellion, in 1818, the soldiers, and especially the Madras Sepoys, with the pioneers and coolies, suffered so severely from this cause that numbers of them perished.'

Among the many noxious insects destructive to the property of man, there is, perhaps none more remarkable than the South African Tsetse-fly (*Glossina morsitans*), whose peculiar buzz when once heard can never be forgotten by the traveller whose means of locomotion are domestic animals ; for it is well known that the bite of this poisonous insect is certain death to the ox, horse, and dog. Fortunately it is limited to particular districts, frequently infesting one bank of a river while the other contains not a single specimen, or else travelling in South Africa would be utterly impossible, and we should now know no more of Lake Ngami or the Zambesi than we did thirty years since. In one journey Dr. Livingstone lost no less than forty-three fine oxen by the bite of the tsetse. A party of Englishmen once attempted to reach Libebé, but they had only proceeded seven or eight days' journey to the north of the Ngami, when both horses and cattle were bitten by the fly, and the party were in consequence compelled to make a hasty retreat. One of the number was thus deprived of as many as thirty-six horses, excellent hunters, and all sustained heavy losses in cattle.



THE TSETSE.

A most remarkable feature in the bite of the tsetse is its perfect harmlessness in man and wild animals, and even calves, so long as they continue to suck the cow. The mule, ass, and goat enjoy likewise the same immunity, and many large tribes on the Zambesi can keep no domestic animals except the latter, in consequence of the scourge existing in their country. Dr. Livingstone's children were frequently bitten, yet suffered no harm, and he saw around him numbers of zebras, buffaloes, pigs, pallahs and other antelopes, feeding quietly in the very habitat of the tsetse, yet as undisturbed by its bite as oxen are when they first receive the fatal poison, which acts in the following manner. After a few days the eyes and nose begin to run, the coat stares as if the animal were cold, a swelling appears under the jaw, and, though the animal continues to graze, emaciation commences, accompanied with a peculiar flaccidity of the muscles; and this proceeds unchecked until, perhaps months afterwards, purging comes on, and the animal, no longer able to graze, perishes in a state of extreme exhaustion. Those which are in good condition often perish, soon after the wound is inflicted, with staggering and blindness, as if the brain were affected by it. Sudden changes of temperature, produced by falls of rain, seem to hasten the progress of the complaint, but in general the emaciation goes on uninterruptedly for months; and do what one may, the poor animals perish miserably, as there is no cure yet known for the disease.

Had any one of our indigenous flies similar poisonous qualities we should never have been able to escape from barbarism; if, by any fatal chance, the tsetse were to settle among us, our prosperity would soon be at an end, and our civilisation imperilled! Reflections such as these are well calculated to humble our pride and check our presumption!

The Abyssinian Tsalt-salya or Zimb, described by Bruce, seems identical with the tsetse, or produces at least similar symptoms. At the season when this plague makes its appearance, all the inhabitants along the sea-coast, from Melinde to Cape Gardafui, and to the south of the Red Sea, are obliged to retire with their cattle to the sandy plains to preserve them from destruction.

The French traveller, D'Escayrac, tells us of a fly in Soudan

which leaves the ox uninjured but destroys the dromedary. On account of this plague the camel is confined to the northern boundary of the Soudan, while the oxen graze in safety throughout the whole country. This fly has caused more migrations among the Arabs of the Soudan than all their wars; and in the dry season it even drives the elephant from Lake Tsad by flying into its ears.

Though the locusts not seldom extend their ravages to the steppes of southern Russia, though they have been known to burst like a cloud of desolation over Transylvania and Hungary, and stray stragglers now and then even find their way to England, yet their chief habitat and birthplace is the torrid zone. They wander forth in countless multitudes, and at very irregular periods; but how it comes that they are multiplied to such an excess in particular years and not in others, has never yet been ascertained, and perhaps never will be. They are armed with two pairs of strong mandibles; their stomach is of extraordinary capacity and power; they make prodigious leaps by means of their muscular and long hind legs; and their wings even carry them far across the sea. On viewing a single locust, one can hardly conceive how they can cause such devastation, but the wonder ceases on hearing of their numbers.



LOCUST.

Mahomet—so say his followers—once read upon the wing of a locust: ‘We are the army of God; we lay ninety-nine eggs; and if we laid a hundred, we should devour the whole earth and all that grows upon its surface.’ ‘O Allah!’ exclaimed the terrified prophet, ‘Thou who listenest patiently to the prayers of Thy Servant, destroy their young, kill their chieftains, and stop their mouths, to save the Moslems’ food from their teeth!’ Scarce had he spoken when the angel Gabriel appeared, saying, ‘God grants thee part of thy wishes.’ And, indeed, as all true believers know, this prayer of their prophet, written on a piece of paper, and enclosed in a reed which is stuck in the ground, is sure to preserve a field or an orchard from locust devastation.

As a locust host advances, its columns are sometimes seen

rising in compact bodies as if propelled by a strong gust of wind ; then, suddenly sinking, they disperse into smaller battalions, not unlike vapours floating about a hill-side at early morn, and when slightly agitated by a breeze ; or they resemble huge columns of sand or smoke, changing their shape every minute.

Onward they come—a dark continuous cloud  
Of congregated myriads, numberless ;  
The rushing of whose wings is as the sound  
Of a broad river headlong in its course,  
Plunged from a mountain summit ; or the roar  
Of a wild ocean in the autumn storm,  
Shattering its billows on a shore of rocks !—SOUTHEY.

During their flight numbers are constantly alighting—an action which has not inaptly been compared to the falling of large snow-flakes. It is, however, not until the approach of night that the locusts encamp. Woe to the spot they select as a resting-place ! The sun sets on a landscape green with all the luxuriance of tropical vegetation ; it rises in the morning over a region naked as the waste of the Sahara !

The locust is fierce, and strong, and grim,  
And an armed man is afraid of him ;  
He comes like a winged shape of dread,  
With his shielded back, and his armed head ;  
And his double wings for hasty flight,  
And a keen unwearying appetite.

He comes with famine and fear along ;  
An army a million, million strong.  
The Goth and the Vandal, and the dwarfish Hun  
With their swarming people, wild and dun,  
Brought not the dread that the locust brings,  
When is heard the rush of their myriad wings.

From the deserts of burning sand they speed,  
Where the lions roam, and the serpents breed.  
Far over the sea, away, away !  
And they darken the sun at noon of day.  
Like Eden the land before they find,  
But they leave it a desolate waste behind.

The peasant grows pale when he sees them come,  
And standeth before them, weak and dumb,  
For they come like a raging fire in power,  
And eat up a harvest in half an hour ;  
And the trees are bare, and the land is brown,  
As if trampled and trod by an army down.

There is terror in every monarch's eye,  
 When he hears that this terrible foe is nigh ;  
 For he knows that the might of an armèd host  
 Cannot drive the spoiler from out his coast :  
 That terror and famine his land await,  
 And from north to south 't will be desolate.

Thus the ravening locust is strong and grim,  
 And what were an armèd man to him ?  
 Fire turneth him not, nor sea prevents,  
 He is stronger by far than the éléments.  
 The broad green earth is his prostrate prey,  
 And he darkens the sun at noon of day.—MARY HOWITT.

The tropical plague of the cockroaches has been introduced into England ; but, fortunately, the giant of the family, the *Blatta gigantea*, a native of many of the warmer parts of Asia, Africa, and South America, is a stranger to our land : and the following truthful description of this disgusting insect gives us every reason to be thankful for its absence:—‘They plunder and erode all kinds of victuals, dressed and undressed, and damage all sorts of clothes, especially such as are touched with powder, pomatum, and similar substances ; everything made of leather ; books, paper, and various other articles, which if they do not destroy, at least they soil, as they frequently deposit a drop of their excrement where they settle, and, some way or other, by that means damage what they cannot devour. They fly into the flame of candles, and sometimes into the dishes ; are very fond of ink and of oil, into which they are apt to fall and perish, in which case they soon turn most offensively putrid—so that a man might as well sit over the cadaverous body of a large animal as write with the ink in which they have died. They often fly into persons' faces or bosoms, and their legs being armed with sharp spines, the pricking excites a sudden horror not easily described. In old houses they swarm by myriads, making every part filthy beyond description wherever they harbour, which in the daytime is in dark corners, behind clothes—in trunks, boxes, and, in short, every place where they can lie concealed. In old timber and deal houses, when the family is retired at night to sleep, this insect, among other disagreeable properties, has the power of making a noise which very much resembles a pretty smart knocking with the knuckle upon the wainscoting. The *Blatta gigantea* in the West Indies is therefore frequently known by the name

of the drummer. Three or four of these noisy creatures will sometimes be impelled to answer one another, and cause such a drumming noise that none but those who are very good sleepers can rest for them. What is most disagreeable, those who have not gauze curtains are sometimes attacked by them in their sleep; the sick and dying have their extremities attacked; and the ends of the toes and fingers of the dead are frequently stripped both of the skin and flesh.

According to Tschudi, the cucaracha and chilibra—two large species of the cockroach—infest Peru in such numbers as almost to reduce the inhabitants to despair. Greedy, bold, cunning, they force their way into every hut, devour the stores, destroy the clothes, intrude into the beds and dishes, and defy every means that is resorted to for their destruction. Fortunately, they are held in check by many formidable enemies, particularly by a small ant, and a pretty little bird (*Troglodytes audax*) belonging to the wagtail family, which has some difficulty in mastering the larger cockroaches. It first of all bites off their head, and then devours their body, with the exception of their membranaceous wings. After having finished his repast, the bird hops upon the nearest bush, and there begins his song of triumph.

Many other insect plagues might be added to the list, but those I have already enumerated suffice to reconcile us to our misty climate, and to diminish our longing for the palm groves of the torrid zone.

Rivalling the mosquitoes in the art of tormenting man, and perhaps even surpassing them in numbers, the equatorial ants may truly be said to hold a despotic sway over the forest and the savannah, over the thicket and the field. It is hardly possible to penetrate into a tropical wood without being reminded, by their stings and bites, that they consider the visit as an intrusion, while they themselves unceremoniously invade the dwellings of man, and lay ruinous contributions on his stores. The inconceivable number of their species defies the memory of the naturalist, to whom many are even still entirely unknown. From almost microscopical size to an inch in length, of all colours and shades between yellow, red, brown, and black, of the most varied habits and stations, the ants of a single

tropical land would furnish study for years to a zealous entomologist. Every family of plants has its peculiar species, and many trees are even the exclusive dwelling-place of some ant nowhere else to be found. In the scathes of leaves, in the corollas of flowers, in buds and blossoms, over and under the earth, in and out of doors, one meets these ubiquitous little creatures, which are undoubtedly one of the great plagues of the torrid zone.

While our indigenous ants cause a disagreeable burning on the skin, by the secretion of a corrosive acid peculiar to the race, the sting or bite of many tropical species causes the most excruciating tortures. 'I have no words,' says Schomburgk, 'to describe the pain inflicted upon me by the mandibles of the *Ponera clavata*, a large, and, fortunately, not very common ant, whose long black body is beset with single hairs. Like an electric shock the pain instantly shot through my whole body, and soon after acquired the greatest intensity in the breast, and over and under the armpits. After a few minutes I felt almost completely paralysed, so that I could only with the greatest difficulty, and under the most excruciating tortures, totter towards the plantation, which, however, it was impossible for me to reach. I was found senseless on the ground, and the following day a violent wound fever ensued.'

'Having, while in Angola, accidentally stepped upon a nest of red ants,' says Livingstone, 'not an instant seemed to elapse before a simultaneous attack was made on various unprotected parts, up the trousers from below, and on my neck and breast above. The bites of these furies were like sparks of fire, and there was no retreat. I jumped about for a second or two, then in desperation tore off all my clothing, and rubbed and picked them off seriatim as quickly as possible! Fortunately, no one observed this rencontre, or word might have been taken back to the village that I had become mad. It is really astonishing how such small bodies can contain so large an amount of ill nature. They not only bite, but twist themselves round after the mandibles are inserted, to produce laceration and pain more than would be effected by the single wound. Frequently, while sitting on the ox, as he happened to tread near a hand, they would rush up his legs to the rider, and soon

let him know that he had disturbed their march. They possess no fear, attacking with equal ferocity the largest as well as the smallest animals. When any person has leaped over the band, numbers of them leave the ranks and rush along the path, seemingly anxious for a fight.'

But however formidable the weapons of the ants may be, yet the injuries they inflict upon the property of man, pouring over his plantations like a flood, and sweeping away the fruits of his labours, are of a much more lasting and serious nature than their painful bite or venomous sting.

In the West Indies, the brown-black *Viviagua*, about one-third of an inch long, and with a prickly thorax, is the greatest enemy of the coffee plantations. In one day it will rob a full-grown tree of all its leaves. It digs deep subterranean passages of considerable dimensions and irregular forms, with a great number of hand-high galleries branching out from the sides, and does even more harm to the coffee-plants by its mining operations than by robbing them of their foliage.

Other species are no less destructive to the sugar plantations, either by settling in the interior of the stalks or by undermining the roots so that the plant becomes sickly and dies.

The Saüba or Coushie (*Æcodoma cephalotes*), a species of ant distinguished by its large head, is the most formidable enemy of the banana and cassava plantations. Such are its numbers that in a very short time it will strip off the leaves of an entire field. Even where their nest is a mile distant from a plantation, these arch depredators know how to find it, and soon form a highway, about half a foot broad, on which they keep up the most active communications with the object of their attack. In masterly order, side by side, one army is seen to move onwards towards the field, while another is returning to the nest. In this last column each individual carries a round piece of leaf, about the size of a sixpence, which is held by one of its edges. If the distance is too great, a party meets the weary carriers half way, and relieves them of their load. Although innumerable ants may thus be moving along, yet none of them will ever be seen to be in the other's way; and all goes on with the regularity of clock-work.

A third party is no less actively employed on the scene of destruction, cutting out circular pieces of the leaves, which, as

soon as they drop upon the ground, are immediately seized by the attentive and indefatigable carriers. Neither fire nor water can prevent them from proceeding with their work. Though thousands may be killed, yet in less than an hour all the bodies will have been removed. Should the highway be closed by an insurmountable obstacle, another is soon laid out, and after a few hours the operations, momentarily disturbed, resume their former activity.

The use of the leaves is to thatch the curious domelike edifices which these indefatigable builders raise over their burrows, and to prevent the loose earth from falling in. Some of these domes are of gigantic dimensions, measuring two feet in height and forty feet in diameter—a prodigious size when compared with the puny proportions of the tiny architects that raise them. Division of labour is carried on to a wonderful extent in these buildings, for the labourers who fetch the leaves do not place them, but merely fling them down on the ground, when they are picked up by a relay of workers who lay them in their proper order. As soon as they have been properly arranged they are covered with small pellets of earth, and in a very short time they are quite hidden by their earthy covering. From these domes cylindrical shafts lead down into the mysterious recesses of the burrows, whose subterranean galleries are so vast and complicated that they have never been fully investigated. Some idea of their extent may be formed from the fact that sulphur smoke having been blown into a nest, one of the outlets was detected at a distance of seventy yards.

Not satisfied with devouring his harvests, the tropical ants leave man no rest even within doors, and trespass upon his household comforts in a thousand various ways.

In Mainas, a province on the Upper Amazon, Professor Pöppig counted no less than seven different species of ants among the tormenting inmates of his hut. The diminutive red Amache was particularly fond of sweets. Favoured by its smallness, it penetrates through the imperceptible openings of a cork, and the traveller was often obliged to throw away the syrup which in that humid and sultry country replaces the use of crystallised sugar, from its having been changed into an ant-comfit. This troublesome lover of sweets lives under the

corner-posts of the hut, so that it is quite impossible to dislodge him.

The devastations of the house-ants are peculiarly hateful to the naturalist, whose collections, often gathered with so much danger and trouble, they pitilessly destroy. Richard Schomburgk suspended boxes with insects from the ceiling by threads strongly rubbed over with arsenic soap; but when, on the following morning, he wished to examine his treasures, instead of his rare and beautiful specimens he found nothing but a host of villanous red ants, who crawling down the threads, had found means to invade the boxes and utterly to destroy their valuable contents.



FORAGING ANTS.

In countless multitudes the Driver or Foraging ants break forth from the primeval forest, marching through the country in compact order, like a well-drilled army. Every creature they meet in their way falls a victim to their dreadful onslaught—rats, mice, lizards, and even the huge python, when in a state of surfeit from recent feeding. If a house obstructs their route, they do not turn out of the way, but go quite through it. Though they sting cruelly when molested, the West Indian planter is not sorry to see them in his house, for it is but a passing visit, and their appearance is the death-warrant for

every spider, scorpion, cockroach, or reptile that pollutes his dwelling. Unfortunately, this thorough cleansing is but of short duration, as in less than a week tropical life calls forth a new generation of vermin.

The wonderful societies of the ants, their strength and perseverance, their unwearied industry, their astonishing intelligence, are so well known, and have been so often and so admirably described,\* that it would be trespassing on the patience of my readers were I to enter into any lengthened details on the subject. And yet, the observations of naturalists have chiefly been confined to the European species, while the economy of the infinitely more numerous tropical ants, confined to countries or places hardly ever visited, or even unknown to civilised man, remains an inexhaustible field for future inquiry.



FUNGUS ANT.

The study of their various buildings alone, from the little we know of them, would occupy a zealous entomologist for years. Here we have an American species that forms its globular nest of the size of a large Dutch cheese, of small twigs artistically interlaced; there another, which (*Formica bispinosa*) uses cotton for its building material, and through the chemical

\* Kirby and Spence's 'Introduction to Entomology;' Swainson's 'Habits and Instincts of Animals.'

agency of its pungent secretion converts it into a spongy substance.

On the west coast of Borneo, Mr. Adams noticed two kinds of ants' nests—one species of the size of a man's hand, adhering to the trunk of trees resembling, when cut through, a section of the lungs; the other was composed of small withered bits of sticks and leaves, heaped up in the axils of branches, somewhat in the form of flattened cylinders and compressed cones. A third species, still more ingenious, constructs its domicile out of a large leaf, bending the two halves by the weight of united millions till the opposite margins meet at the under surface of the mid-rib, where they are secured by a gummy matter. The stores and larvæ are conveyed into the nest so made by regular beaten tracks along the trunk and branches of the tree.

On the large plains near Lake Dilolo, where water stands so long annually as to allow the lotus and other aqueous plants to come to maturity, Dr. Livingstone had occasion to admire the wonderful sagacity of the ants, whom he declares to be wiser than some men, as they learn by experience. When all the land is submerged a foot deep, they manage to exist by ascending to little houses, built of black tenacious loam, on stalks of grass, and placed higher than the line of inundation. This must have been the result of experience, for if they had waited till the water actually invaded their habitations on the ground, they would not have been able to procure materials for their higher quarters, unless they dived down to the bottom for every mouthful of clay. They must have been built in anticipation, 'and if so,' says the celebrated traveller, 'let us humbly hope that the sufferers by the late inundations in France may be possessed of as much common sense as the little black ants of the Dilolo plains.'

Unable or unwilling to work themselves, some species of ants make war upon others for the sole purpose of procuring bondsmen, who literally and truly labour for them, and perform all the domestic duties of the community; but the Mexican honey ants (*Myrmecocystus Mexicanus*) are, if possible, still more remarkable, for here we see an animal rearing others of the same species for the purpose of food. Some of these ants, namely, are distinguished by an enormous swelling of the ab-

domen, which is converted into a mass like honey, and being unable, in their unwieldy condition, to seek food themselves, are fed by the labourers, until they are doomed to die for the benefit of the community. Whether this vast distension is the result of an intestinal rupture, caused by an excessive indulgence of the appetite, or whether they are purposely selected, confined, and over-fed, or wounded for the purpose, has not yet been ascertained.

The termites, or white ants, as they are commonly called, though they in reality belong to a totally different order of insects, are spread in countless numbers over all the warmer regions of the earth, emulating on the dry land the bore-worm in the sea; for when they have once penetrated into a building, no timber except ebony and iron-wood, which are too hard, or such as is strongly impregnated with camphor and aromatic oils, which they dislike, is capable of resisting their attacks. Their favourite food is wood, and so great are their multitudes, so admirable their tools, that in a few days they devour the timberwork of a spacious apartment. Outwardly, the beams and rafters may seem untouched, while their core is completely consumed, for these destructive miners work in the dark, and seldom attack the outside until they have previously concealed themselves and their operations by a coat of clay. Scarcely any organic substance remains free from their attacks; and forcing their resistless way into trunks, chests, and wardrobes, they will often devour in one night all the shoes, boots, clothes, and papers they may contain. It is principally owing to their destructions, says Humboldt, that it is so rare to find papers in tropical America of an older date than fifty or sixty years. Smeathman relates, that a party of them once took a fancy to a pipe of fine old Madeira, not for the sake of the wine, almost the whole of which they let out, but of the staves, which, however, may not have proved less tasteful from having imbibed some of the costly liquor. On surveying a room which had been locked up during an absence of a few weeks, Forbes, the author of the 'Oriental Memoirs,' observed a number of advanced works in various directions towards some prints and drawings in English frames; the glasses appeared to be uncommonly dull, and the frames covered with dust. On attempting to wipe it off, he was astonished to find the glasses fixed to

the wall, not suspended in frames as he left them, but completely surrounded by an incrustation cemented by the white ants, who had actually eaten up the deal frames and backboards and the greater part of the paper, and left the glasses upheld by the incrustation or covered way which they had formed during their depredations.

On the small island of Goree, near Cape Verde, the French naturalist, Adanson, lived in a straw hut, which, though quite new at the time he took up his residence in it, became transparent in many places before the month was out. This might have been endured, but the villanous termites ravaged his trunk, destroyed his books, penetrated into his bed, and at last attacked the naturalist himself. Neither sweet nor salt water, neither vinegar nor corrosive liquids, were able to drive them away, and so Adanson thought it best to abandon the premises, and to look out for another lodging.

The ravages of the termites are, however, perhaps more than compensated by their services in removing decayed vegetable substances from the face of the earth, and thus contributing to the purity of the air and the beauty of the landscape. If the forests of the tropical world, where thousands of gigantic trees succumb to the slow ravages of time, or are suddenly prostrated by the hurricane, still appear in all the verdure of perpetual youth, it is chiefly to the unremitting labours of the termites that they are indebted for their freshness.

Though belonging to a different order of the insect world, the economy of the termites is very similar to that of the real ants. They also form communities, divided into distinct orders; labourers (larvæ), soldiers (neuters), perfect insects—and they also erect buildings, but of a far more astonishing structure. Several of their species (*T. atrox*, *bellicosus* Smeathman) erect high dome-like edifices, rising from the plain, so that at first sight they might be mistaken for the hamlets of the negroes; others (*T. destructor arborum*) build on trees, often at a considerable height above the ground. These sylvan abodes are frequently the size of a hogshead, and are more generally found in the New World.

The clay-built citadels or domes of the *Termes bellicosus*, a common species on the West Coast of Africa, attain a height of twelve feet, and are constructed with such strength that the traveller often ascends them to have an uninterrupted view of



TERMITE HILLS.



the grassy plain around. Only the under part of the mound is inhabited by the white ants, the upper portion serving principally as a defence from the weather, and to keep up in the lower part the warmth and moisture necessary to the hatching of the eggs and cherishing of the young ones. In the centre, and almost on a level with the ground, is placed the sanctuary of the whole community—the large cell, where the queen resides with her consort, and which she is doomed never to quit again, after having been once enclosed in it, since the portals soon prove too narrow for her rapidly-increasing bulk. Encircling the regal apartment, extends a labyrinth of countless chambers, in which a numerous army of attendants and soldiers is constantly in waiting. The space between these chambers and the external wall of the citadel is filled with other cells, partly destined for the eggs and young larvæ, partly for store-rooms. The subterranean passages which lead from the mound are hardly less remarkable than the building itself. Perfectly cylindrical, and lined with a cement of clay, similar to that of which the hill is formed, they sometimes measure a foot in diameter. They run in a sloping direction, under the bottom of the hill, to a depth of three or four feet, and then ramifying horizontally into numerous branches, ultimately rise near to the surface at a considerable distance. At their entrance into the interior of the hill, they are connected with a great number of smaller galleries, which, gradually winding round the whole building to the top, intersect each other at different heights. The necessity for the vast size of the main galleries underground, evidently arises from the circumstance of their being the great thoroughfares for the inhabitants, by which they fetch their clay, wood, water, or provisions, and their gradual ascent is requisite, as the Termites can only with great difficulty climb perpendicularly.

It may be imagined that such works require an enormous population for their construction; and, indeed, the manner in which an infant colony of termites is formed and grows, until becoming, in its turn, the parent of new migrations, is not the least wonderful part of this wonderful insect's history.

At the end of the dry season, as soon as the first rains have fallen, the male and female perfect termites, each about the size of two soldiers, or thirty labourers, and furnished with four

long narrow wings folded on each other, emerge from their retreats in myriads. After a few hours their fragile wings fall off, and on the following morning they are discovered covering the surface of the earth and waters, where their enemies—birds, reptiles, ants—cause so sweeping a havoc that scarce one pair out of many thousands escapes destruction. If by chance the labourers, who are always busy prolonging their galleries, happen to meet with one of these fortunate couples, they immediately, impelled by their instinct, elect them sovereigns of a new community, and, conveying them to a place of safety, begin to build them a small chamber of clay, their palace and their prison—for beyond its walls they never again emerge.



TERMITE.

Soon after the male dies, but, far from pining and wasting over the loss of her consort, the female increases so wonderfully in bulk that she ultimately weighs as much as 30,000 labourers, and attains a length of three inches, with a proportional width. This increase of size naturally requires a corresponding enlargement of the cell, which is constantly widened by the indefatigable workers. Having reached her full size, the queen now begins to lay her eggs, and as their extrusion goes on uninterruptedly, night and day, at the rate of fifty or sixty in a minute, for about two years, their total number may probably amount to more than fifty millions! A wonderful fecundity, which explains how a termite colony, originally few in number, increases in a few years to a population equalling or surpassing that of the British empire.

This incessant extrusion of eggs necessarily calls for the attention of a large number of the workers in the royal chamber, to take them as they come forth, and carry them to the nurseries, in which, when hatched, they are provided with food, and carefully attended till they are able to shift for themselves, and become in their turn useful to the community.

In widening their buildings according to the necessities of their growing population, from the size of small sugar-loaves to that of domes which might be mistaken for the hovels of Indians or negroes, as well as in repairing their damages, the termite workers display an unceasing and wonderful activity, while the soldiers, or neuters, which are in the proportion of about one to

every hundred labourers, and are at once distinguished by the enormous size of their heads armed with long and sharp jaws, are no less remarkable for their courage and energy.

When anyone is bold enough to attack their nest and make a breach in its walls, the labourers, who are incapable of fighting, immediately retire, upon which a soldier makes his appearance, obviously for the purpose of reconnoitring, and then also withdraws to give the alarm. Two or three others next appear, scrambling as fast as they can one after the other; to these succeed a large body, who rush forth with as much speed as the breach will permit, their numbers continually increasing during the attack. These little heroes present an astonishing, and at the same time a most amusing spectacle. In their haste they frequently miss their hold, and tumble down the sides of their hill; they soon, however, recover themselves, and being blind, bite everything they run against. If the attack proceeds, the bustle increases to a tenfold degree, and their fury is raised to its highest pitch. Woe to him whose hands or legs come within their reach, for they will make their fanged jaws meet at the very first stroke, drawing their own weight in blood, and never quitting their hold, even though they are pulled limb from limb. The courage of the bulldog is as nothing compared to the fierce obstinacy of the termite-soldier.



SOLDIER.

So soon as the injury has ceased, and no further interruption is given, the soldiers retire, and then you will see the labourers hastening in various directions towards the breach, each carrying in his mouth a load of tempered mortar half as big as himself, which he lays on the edge of the orifice, and immediately hastens back for more. Not the space of the tenth part of an inch is left without labourers working upon it at the same moment; crowds are constantly hurrying to and fro; yet, amid all this activity, the greatest order reigns—no one impedes the other, but each seems to thread the mazes of the multitude without trouble or inconvenience. By the united labours of such an infinite host the ruined wall soon rises again; and Mr. Smeathman has ascertained that in a single night they will restore a gallery of three or four yards in length.

In numbers and architectural industry the American Termites

are not inferior to those of the Old World. In the savannahs of Guiana their sugar-loaf or mushroom-shaped, pyramidal or columnar hills are everywhere to be seen, impenetrable to the rain, and strong enough to resist even a tropical tornado. On the summits of these artificial mounds a neat little falcon (*Falco sparverius*) often takes his station, darting down, from time to time, like lightning upon some unfortunate lizard, and then again speedily returning to his look-out. The large caracara eagle (*Polyborus caracara*) likewise chooses these eminences as an observatory from whence he rushes robber-like on his prey; there also an ugly black lizard (*Echymotes torquatus*) loves to sun itself, but disappears immediately in the grass as soon as a traveller approaches.

In many parts of the Brazilian campos or savannahs the termite-hills, which are there generally of a more flattened form, are so numerous that one is almost sure to meet with one of them at the distance of every ten or twenty paces. The great ant-bear digs deep holes into their sides, where afterwards small owls build their nests. Similar termite structures, of a dark-brown colour, and a round form, are attached to the thick branches of the trees, and you will scarcely meet with a single specimen of the tall candelabra-formed cactuses (*Cerei*), so common on those high grass-plains, that is not loaded with their weight.

In spite of their working in the dark, in spite of their subterranean tunnels, their strongholds, and the fecundity of their queens, the termites, even when their swarms do not expose themselves to the dangers already mentioned, are subject to the attacks of innumerable foes—ant-eaters, birds, and a whole host of insects—that do man no little service by keeping them within bounds.

One of their most ferocious enemies is a species of black ant, which, on the principle of setting one thief to catch another, is used by the negroes of Mauritius for their destruction. When they perceive that the covered ways of the termites are approaching a building, they drop a train of syrup as far as the nearest encampment of the hostile army. Some of the black ants, attracted by the smell and taste of their favourite food, follow its traces and soon find out the termite habitations. Immediately part of them return to announce the welcome intelli-

gence, and after a few hours a black army, in endless columns, is seen to advance against the white-ant stronghold. With irresistible fury (for the poor termites are no match for their poisonous sting and mighty mandibles) they rush into the galleries, and only retreat after the extirpation of the colony. Mr. Baxter ('Eight Years' Wanderings in Ceylon') once saw an army of black ants returning from one of these expeditions. Each little warrior bore a slaughtered termite in his mandibles, rejoicing no doubt in the prospect of a quiet dinner-party at home. Even man is a great consumer of termites, and they are esteemed a delicacy by the natives, both in the old and in the new world.

In some parts of the East Indies the people have an ingenious way of emptying a termite-hill, by making two holes in it, one to the windward and the other to the leeward, placing at the latter opening a pot rubbed with an aromatic herb to receive the insects, when driven out of their nest by the smoke of a fire made at the former breach. In South Africa the general way of catching them is to dig into the ant-hill, and when the builders come forth to repair the damage, to brush them off quickly into the vessel, as the ant-eater does into his mouth. They are then parched in iron pots over a gentle fire, stirring them about as is done in roasting coffee, and eaten by handfuls, without sauce or any other addition, as we do comfits. According to Smeathman, they resemble in taste sugared cream, or sweet almond paste, and are, at the same time, so nutritious that the Hindoos use them as a restorative for debilitated patients.

While most termites live and work entirely under covered galleries, the marching white ant (*T. viarum*) exposes itself to the day. Smeathman, on one occasion, while passing through a dense forest, suddenly heard a loud hiss like that of a serpent; another followed, and struck him with alarm; but a moment's reflection led him to conclude that these sounds proceeded from white ants, although he could not see any of their huts around. On following this noise, however, he was struck with surprise and pleasure at perceiving an army of these creatures emerging from a hole in the ground, and marching with the utmost-swiftness. Having proceeded about a yard, this immense host divided into two columns, chiefly composed of labourers, about

fifteen abreast, following each other in close order, and going straight forward. Here and there was seen a soldier, carrying his vast head with apparent difficulty, at a distance of a foot or two from the columns; many other soldiers were to be seen, standing still or passing about, as if upon the look-out lest some enemy should suddenly surprise their unwarlike comrades. But the most extraordinary and amusing part of the scene was exhibited by some other soldiers, who having mounted some plants, ten or fifteen inches from the ground, hung over the army marching below, and by striking their jaws upon the leaves at certain intervals, produced the noise above mentioned; to this signal the whole army immediately returned a hiss and increased their pace. The soldiers at these signal-stations sat quite still during these intervals of silence, except now and then making a slight turn of the head, and seemed as solicitous to keep their posts as regular sentinels. After marching separately for twelve or fifteen paces, the two columns of this army again united, and then descended into the earth by two or three holes. Mr. Smeathman watched them for more than an hour, without perceiving their numbers to increase or diminish. Both the labourers and soldiers of this species are furnished with eyes.

One of the many unsolved mysteries of termite life is whence they derive the large supplies of moisture with which they not only temper the clay for the construction of their long covered ways above ground, but keep their passages uniformly damp and cool below the surface. Yet their habits in this particular are unvarying, in the seasons of drought as well as after rain; in the most arid positions; in situations inaccessible to drainage from above, and cut off by rocks and impervious strata from springs from below. Struck with this wonderful phenomenon, Dr. Livingstone raises the question whether the termites may not possess the power of combining the oxygen or hydrogen of their vegetable food by vital force, so as to form water; and indeed it is highly probable that they are endowed with some such faculty, which, however wonderful, would still be far less astonishing than the miracles of their architectural instinct.

After having described the miseries which the tropical insects inflict upon man—how they suck his blood, destroy his

rest, exterminate his cattle, devour the fruits of his fields and orchards, ransack his chests and wardrobes, feast on his provisions, and plague and worry him wherever they can—it is but justice to mention their services.

Among the insects which are of *direct* use to us, the silk-worm (*Bombyx mori*) is by far the most important. Originally a native of tropical or sub-tropical China, where the art of making use of its filaments seems to have been discovered at a very early period, it is now reared in countless numbers far and wide over the western world, so as to form a most important feature in the industrial resources of Europe. Thousands of skilful workmen are employed in spinning and weaving its lustrous threads, and thousands upon thousands, enjoying the fruits of their labours, now clothe themselves, at a moderate price, in silken tissues which but a few centuries back were the exclusive luxury of the richest and noblest of the land.

Besides the silk-worm, we find many other moths in the tropical zone whose cocoons might advantageously be spun, and only require to be better known to become considerable articles of commerce. The tusseh-worm (*Bombyx mylitta*) of Hindostan, which lives upon the leaves of the *Rhamnus jujuba* furnishes a dark-coloured, coarse, but durable silk; while the Arandi (*B. cynthia*), which feeds upon the foliage of the castor-oil plant (*Ricinus communis*), spins remarkably soft threads, which serve the Hindoos to weave tissues of uncommon strength.

In America, there are also many indigenous moths whose filaments might be rendered serviceable to man, and which seem destined to great future importance, when trade, quitting her usual routine, shall have learnt to pry more closely into the resources of Nature.

While the Cocci, or plant bugs, are in our country deservedly detested as a nuisance, destroying the beauty of many of our garden plants by their blighting presence, two tropical members of the family, as if to make up for the misdeeds of their relations, furnish us—the one with the most splendid of all scarlet dyes, and the other with gumlac, a substance of hardly inferior value.

The English gardener spares no trouble to protect his hot- and greenhouse plants from the invasion of the *Coccus hesperidum*;

but the Mexican *haciendero* purposely lays out his Nopal plantations that they may be preyed upon by the *Coccus cacti*, and rejoices when he sees the leaves of his opuntias thickly strewn with this valuable parasite. The female,\* who from her form and habits might not unaptly be called the tortoise of the insect



COCHINEAL.

world, is much larger than the winged male, and of a dark-brown colour, with two light spots on the back, covered with a white powder. She uses her little legs only during her first youth, but soon she sucks herself fast, and henceforward remains immovably attached to the spot she has chosen, while her mate continues to lead a wandering life. While thus fixed like an oyster, she swells or grows to such a size that she looks more like a seed or berry than an insect; and her legs, antennæ, and proboscis, concealed by the expanding body, can hardly be distinguished by the naked eye. Great care is taken to kill the insects before the young escape from the eggs, as they have then the greatest weight, and are most impregnated with colouring matter. They are detached by a blunt knife dipped in boiling water to kill them, and then dried in the sun, when they have the appearance of small, dry, shrivelled berries, of a deep-brown purple or mulberry colour, with a white matter between the wrinkles. The collecting takes place three times a year in the plantations, where the insect, improved by human care, is nearly twice as large as the wild coccus, which in Mexico is gathered six times in the same period. Although the collecting of the cochineal is exceedingly tedious—about 70,000 insects going to a single pound—yet, considering the high price of the article, its rearing would be very lucrative, if both the insect and the plant it feeds upon were not liable to the ravages of many diseases, and the attacks of numerous enemies.

The conquest of Mexico by Cortez first made the Spaniards acquainted with cochineal. They soon learnt to value it as one of the most important products of their new empire, and in order to secure its monopoly, prohibited, under pain of death, the exportation of the insect, and of the equally indigenous

Nopal, or *Cactus cochinellifer*, supposing it not to be able to live upon any other plant. In the year 1677, however, Thierry de Meronville, a Frenchman, made an effort to deprive them of the exclusive possession of the treasure they guarded with such jealous care. Under a thousand dangers, and by means of lavish bribery, he succeeded in transporting some of the plants, along with their costly parasite, to the French colony of San Domingo; but, unfortunately, his perseverance did not lead to any favourable results, and more than a century elapsed after this first ineffectual attempt before the rearing of cochineal extended beyond its original limits.

In the year 1827, M. Berthelot, director of the botanical garden at Orotava, was more fortunate in introducing it into the Canary Islands, where it thrives so well upon the *Opuntia Ficus indica*, that Teneriffe rivals Mexico in its production. At present Cochineal is not only raised in many other parts of the tropical world, but even in Spain, near Valencia and Malaga.

The Coccus which produces lac, or gumlac, is a native of India, and thrives and multiplies best on several species of the fig-tree. A cheap method having been discovered within the last few years of separating the colouring matter which it contains from the resinous part, it has greatly increased in commercial importance.

In the tropical zone we find that not only many birds and several four-footed animals live chiefly, or even exclusively, on insects, but that they are even consumed in large quantities, or eaten as delicacies, by man himself. The nomade of the Sahara and the South African bushman hail the appearance of locust swarms as a season of plenty and good living, and ants' eggs eke out the meagre bill of fare of the wild Indians on the banks of the Orinoco.

Several of the large African caterpillars are edible, and considered as a great delicacy by the natives. On the leaves of the Mopané tree, in the Bushman country, the small larvæ of a winged insect, a species of *Psylla*, appear covered over with a sweet gummy substance, which is collected by the people in great quantities, and used as food. Another species in New Holland, found on the leaves of the Eucalyptus, emits a similar secretion, which, along with its insect originator, is scraped off the leaves and eaten by the aborigines as a saccharine dainty.

The chirping *Cicadæ*, or frog-hoppers, which Aristotle mentions as delicious food, are still in high repute among the American Indians; and the Chinese, who allow nothing edible to go to waste, after unravelling the cocoon of the silkworm, make a dish of the pupæ, which the Europeans reject with scorn.

The Goliath beetles of the coast of Guinea are roasted and eaten by the natives, who doubtless, like many other savages, not knowing the value of that which they are eating, often make a *bonne bouche* of what an entomologist would most eagerly desire to preserve.

Several of the more brilliant tropical beetles are made use of as ornaments, not only by the savage tribes, but among nations which are able to command the costliest gems of the East. The golden elytra of the *Sternocera chrysis* and *Sternocera sternicornis* serve to enrich the embroidery of the Indian zenana, while the joints of the legs are strung on silken threads, and form bracelets of singular brilliancy.

The ladies in Brazil wear necklaces composed of the azure green and golden wings of lustrous *Chrysomelidæ* and *Curculionidæ*, particularly of the Diamond beetle (*Entimus nobilis*); and in Jamaica, the elytra of the *Buprestis gigas* are set in ear-rings, whose gold-green brilliancy rivals the rare and costly *Chrysopras* in beauty.



DIAMOND BEETLE.



BUPRESTIS GIGAS.



MALAY PIRATES.

## CHAPTER XX.

### THE MALAYAN RACE.

Physical Conformation of the Malays—Betel Chewing—Their Moral Character—Limited Intelligence of the Malays—Their Maritime Tastes—Piracy—Gambling—Cock-fighting—Running A-muck!—Fishing—Malayan Superstitions—The Battas—Their Cannibalism—Eating a Man alive—The Begus—Aërial Huts—Funeral Ceremonies—The Dyaks—Head-hunting—The Sumpitan—Large Houses.

UNLIKE the apathetic Indian hunter, whose wishes are bounded by the forest or the savannah, where the chase provides him with a scanty subsistence, or the good-humoured Negro who, fond of agriculture, and attached to the soil on which he was born, never thinks of wandering of his own free will to distant countries, the roving race of the Malays has scattered its colonies far and wide over the Indian Archipelago.

The colour of the various tribes of this remarkable people is a yellowish-brown, and varies but little throughout the numerous islands extending from Sumatra and the peninsula of Malacca to the Moluccas. The hair is black, coarse and straight, the beard scanty. The stature is below the average European size,

the breast well developed, the limbs meagre. The face is broad and somewhat flat, with high cheek-bones, a small nose, a large mouth with broad lips, and black eyes with angular orbits. The children and young people of both sexes are often really handsome in face and graceful in figure, but as they advance in age their features become hard, and frequently present a repulsive appearance.

Like most nations in a rude state of society, they are in the habit of permanently disfiguring parts of the body under the idea of ornament. Considering blackness a becoming colour for the teeth—for dogs, they say, have them white—they file the enamel so that the bone may be tinged by the juice of the pungent betel, which, wrapped round the nut of the areca palm, and mixed with lime, they are in the habit of chewing from morning till night. This combination, besides discolouring the teeth, has the disgusting property of dyeing the saliva of so deep a red that the lips and gums appear as if coloured with blood; yet it is in universal use throughout the whole Indian Archipelago, and, as excuses are never failing to justify bad habits, is said to have tonic effects and to promote digestion.

The Malays are not a demonstrative people; their behaviour towards strangers is marked by a reserve, a distrust, or even a timidity which inclines the observer to tax with exaggeration the wild and bloodthirsty character which is generally ascribed to their race. The feelings of astonishment, admiration, and fear are never openly expressed, and their slow and considerate speech shows how careful they are not to give offence.

To indulge in a joke is quite contrary to their natural disposition, and they deeply feel, and are ever ready to resent, a breach of etiquette or a personal affront. The higher classes are extremely polite, and have all the quiet manners and dignity of the best educated Europeans. But this external polish is united with a reckless cruelty and contempt for human life which forms the dark side of their character. Hence it is not to be wondered at that different authors give us such totally contradictory accounts of them.

An old traveller, Nicolo Conti, who wrote in 1430, says that 'the inhabitants of Java and Sumatra surpass all other people in cruelty,' while Drake praises their love of truth and justice.

Mr. Crawford describes the Javanese as a peaceable and industrious people, but Barbosa, who visited Malacca about the year 1660, informs us that they are extremely cunning and great cheats; that they seldom speak the truth, and are ever ready for a villanous deed.

Their intelligence seems to be incapable of any higher flight. They comprehend nothing which goes beyond the simplest combination of ideas, and have little taste and energy to obtain an increase of knowledge. The civilisation they possess shows no traces of original growth, but is entirely confined to those nations or states which have adopted the Mahometan religion, or in still earlier times received their culture from India.

It must, however, be remarked in their favour that the curse both of domestic tyranny and of a foreign yoke weighs heavily upon them, and that the extension of European domination in the Indian Ocean has been as fatal to their race as it has been in America and Africa to the Red-skin and the Negro.

‘The first voyagers from the west,’ says Rajah Brooke, ‘found the natives rich and powerful, with strong established governments, a flourishing literature, and a thriving trade with all parts of the eastern world. The rapacious European has reduced them to their present abject condition. Their governments have been broken up; the old states decomposed by treachery, by bribery, and intrigue; their possessions wrested from them under flimsy pretences, their trade restricted, their vices encouraged, and their virtues repressed.’

‘Among the Malays of the present day,’ says Newbold, ‘we look in vain for that desire of knowledge which excited their ancestors to transplant the flowers of Arabian literature among their own forests. Works of science are now no longer translated from the Arabic, and creations of the imagination have almost ceased to appear. The few children educated among them learn nothing but to mumble in an unknown tongue a few passages from the Koran, entirely neglecting arithmetic and the acquirement of any useful manual art or employment. Painting, sculpture, architecture, mechanics, geography, are totally unknown to the Malays. Their literature declined with the fall of their empire in the Archipelago, nor could it

well be expected to flourish under the Upas trees of Portuguese intolerance, Dutch oppression, and British apathy.'

Essentially maritime in their tastes, the Malays have been named the Phœnicians of the East; but not satisfied with the peaceful pursuits of the fisherman or the merchant, many of them infest the Indian Ocean as merciless pirates.

Encouraged by the weakness and distraction of the old-established Malay governments, the facilities offered by natural situation, and the total absence of all restraint from European nations, except now and then the destruction of some mud fort or bamboo-village, which is soon rebuilt, the Illanuns, the Balagnini, and other sea-robbing tribes, issue forth like beasts of prey, enslave or murder the inhabitants on the coasts or at the entrance of rivers, and attack ill-armed or stranded European vessels.

The Illanuns of Mindanao are particularly noted for their daring and long-protracted piratical excursions, which they undertake in large junks with sails, netting, and heavy guns. On one occasion the 'Rajah Brooke' met eighteen Illanun boats on neutral ground, and learned from their two chiefs that they had been two years absent from home; and from the Papuan slaves on board it was evident that their cruise had extended from the most eastern islands of the Archipelago to the north-western coast of Borneo.

The Balagnini inhabit a cluster of small islands in the vicinity of Sooloo, where they probably find encouragement and a slave market. They cruise in large prahus, and to each of these a fleet boat or 'sampan' is attached, which on occasion can carry from ten to fifteen men. They seldom have large guns like the Illanuns, but, in addition to their other arms, brass pieces, carrying from a one- to a three-pound ball. They use long poles with barbed iron points, with which, during an engagement or flight, they hook their prey. By means of their sampans they are able to capture all small boats; and it is a favourite device with them to disguise one or two men, whilst the rest lie concealed in the bottom of the boat, and thus to surprise prahus at sea, and fishermen or others at the mouths of rivers. Their cruising grounds are very extensive; they frequently make the circuit of Borneo; Gillolo and the Moluccas lie within their range, and it is probable that Papua is

occasionally visited by them. The Borneans, from being so harassed by these freebooters, who yearly take a considerable number of this unwarlike people into slavery, call the easterly monsoon 'the pirate wind.' Their own native governments are probably without exception participators in or victims to piracy, and in many cases both—purchasing from one set of pirates and enslaved and plundered by another; and whilst their dependencies are abandoned, the unprotected trade goes to ruin. Thus piracy rests like a blighting curse upon lands pre-eminently blessed by Nature, and proves as ruinous to the welfare of the Eastern Archipelago as the black stain of the African slave trade to that of the Negroes.

The Malays are inveterate gamblers, and, perhaps for want of some nobler object on which to expend their mental energies, carry the mania of betting at cock-fights to a ruinous excess. Passionately addicted to this favourite amusement, they will lose all their property on a favourite bird, and having lost that, stake their families, and after the loss of wife and children, their own personal liberty, being prepared to serve as slaves in case of losing. Whole poems are devoted to enthusiastic descriptions of cock-fighting, which is regulated by universally acknowledged laws as minute as those of the Hoyleian Code.

The birds are not trimmed as in England, but fight in full feather, armed with straight or curved artificial spurs, sharp as razors and about two and a half inches long. Large gashes are inflicted by these murderous instruments, and it rarely happens that both cocks survive the battle. One spur only is used, and is generally fastened near the natural spur on the inside of the left leg. Cocks of the same colour are seldom matched. The weight is adjusted by the setters-to, passing them to and from each other's hands as they sit facing each other in the cock-pit. Should there be any difference, it is brought down to an equality by the spur being fixed so many scales higher on the leg of the heavier cock, or as deemed fair by both parties. In adjusting these preliminaries the professional skill of the setters-to is called into action, and much time is taken up in grave deliberation, which often terminates in wrangling. The birds, after various methods of irritating them have been practised, are then set to. During the continuance of the battle the excitement and interest taken by the gambling spectators in

the barbarous exhibition is vividly depicted in their animated looks and gestures.

The Malays who are not slaves go always armed; they would think themselves disgraced if they went abroad without their crees or poniards, which, to render them more formidable, are often steeped in poison. These weapons, which thus afford them the ready means for avenging an affront, are probably the chief cause which renders their outward deportment to each other remarkably punctilious and courteous, but they sometimes become highly dangerous in the hands of a people whose nervous temperament is liable to sudden explosions of frantic rage. Like the old Berserks of the heroic ages of Scandinavia, a Malay is capable of so far working himself into fury, of so far yielding to some spontaneous impulse, or of so far exciting himself by stimulants, as to become totally regardless of what danger he exposes himself to. In this state, which is called 'running a-muck,' he rushes forth as an infuriated animal and attacks all who fall in his way, until he is either struck down like a wild beast, or having expended his morbid rage he falls down exhausted.

The Malays are bad agriculturists and artisans but excellent sportsmen. From the small birds which they entangle in their snares to the large animals of the forest, which they shoot or entrap in pit-falls, or destroy by spring-guns, nothing worth catching escapes their attention. Such is their delight in fishing, that even women and children may be seen in numbers during the rains angling in the swampy rice grounds. Spearing excursions against the swordfish are undertaken during the dark of the moon by the light of torches. A good eye, a steady hand are necessary, and a perfect knowledge of the places where the fish are to be found. Each canoe carries a steersman, a man with a long pole to propel the vessel, and a spearsman, who, armed with a long slender javelin having a head composed of the sharpened spikes of the Nibong palm, and holding in his left hand a large blazing torch, takes his station at the stern of the canoe. They thus glide slowly and noiselessly over the still surface of the clear water, till the rays of the flambeau either attract the prey to the surface or discover it lying seemingly asleep at a little depth below. The sudden splash of the swiftly descending spear is heard, and the fish is the next moment seen glittering in the air, either transfixed

by the spikes or caught in the interstices as the weapon is withdrawn.

As a natural consequence of their extreme ignorance, the Malays, even the best educated, are inordinately superstitious, and people the invisible world with a host of malignant spirits. The Pamburk roams the forest, like the wild huntsman of the Haruz, with démon dogs, and the storm fiend Hantu Ribut howls in the blast and revels in the whirlwind. Tigers are considered in many instances to be the receptacles of the souls of departed human beings, and they believe that some men have the faculty of transforming themselves at pleasure into tigers, and that others enjoy the privilege of invulnerability. They rely firmly on the efficacy of charms, spells, amulets, talismans, lucky and unlucky moments, magic, and judicial astrology. To pull down or repair a seriously damaged house is considered unlucky, so that whenever a Malay has occasion to build a new house he leaves the old one standing.

While the coasts of Borneo and Sumatra are occupied by the more civilised Mahometan Malays, the interior of these vast islands is inhabited by nations, probably of the same race, who, secluded from the rest of the world, exhibit in their customs a strange and almost incredible mixture of good and evil, of humane tendencies and diabolical barbarism.

Thus the Battas, who next to the Malays are the most numerous people of Sumatra, have the same polite and ceremonious manner, they possess an ancient code of law, they write books, and are fond of music, they build commodious houses, which they ornament with tasteful carvings, they wear handsome tissues and know the art of smelting and amalgamating metals; they are extremely good-natured, and yet they not only eat human flesh, but eat it under circumstances of unexampled atrocity.

According to their own traditions, their ancestors knew nothing of this horrid practice, which was first instigated by the demon of war about the year 1630, and from being originally an act of vengeance or fury, became at length one of their institutions in times of peace, and is now legally sanctioned as a punishment for certain heavy crimes. In some cases the delinquent is first killed and then eaten, in others he is eaten alive, an aggravated punishment which, however, is only reserved for traitors, spies, and enemies seized arms in

hand. Before the day appointed for execution, messengers are sent to all friends and allies, and preparations made as for a great festival. The victim, tied to a stake, awaits his horrible fate, while the air resounds with music and the clamour of hundreds of spectators. The rajah of the village steps forward, draws his knife, addresses the assembly, relates the crimes which justify the sentence, and says that now the moment is come for punishing the doomed wretch, whom he describes as a hellish scoundrel, as a Satan in a human form. At these words the actors in the shocking drama about to be performed feel, as they say, an invincible longing to swallow a piece of the villain's flesh, as they then feel sure that he can do them no further harm, and impatiently brandish their knives.

The rajah or the injured person, such is his privilege, now cuts off the first piece of flesh, which he generally selects from the inner side of the forearm (this being esteemed the most delicate morsel), or from the cheek when sufficiently fat, holds it up triumphantly, and tastes some of the flowing blood, his eyes at the same time sparkling with delight. He then hurries to one of the fires that have been kindled close by to broil his piece of meat before swallowing it, while the whole troop falls upon the miserable wretch, who, hacked to pieces, and bleeding from a hundred wounds, in a few moments expires. The avidity with which they devour his quivering flesh, untouched by his shrieks and supplications, is the more to be wondered at as in other cases they show themselves susceptible of a tender pity for the sufferings of others. As if scenes like these were not sufficiently horrible, it has even been affirmed that the Battas eat their aged parents alive, but we hardly need the authority of Dr. Junghuhn, who, during a residence of two years among the Battas, only heard of three cases of public cannibalism, that this report has no foundation in truth. So much, however, is certain, that this singular people have a great liking for human flesh, and in all cases where a simple execution takes place seize the opportunity of quietly carrying home some favourite joint.

The Battas have no priests, no temples, no idols.\* They believe in a number of evil spirits, or Begus, who have their seat in the various diseases of the human body, and in a few

\* Junghuhn, 'Die Battaländer.' Berlin, 1847.

good spirits, or Sumongot, the immortal souls of great forefathers, who reside on the high mountain tops. The souls only of such persons as die of a violent death ascend into the invisible land of immortality, and this may be some consolation to the poor wretches whom they horribly cut up at their cannibal feasts, while all persons dying of illness are considered as having fallen into the power of the Begus, and as totally annihilated. They have no idea of a Supreme Being, and their only religious ceremony, if such it may be called, is that on festival occasions they scatter rice to the four quarters of the wind, in order to propitiate the Begus.

In consequence of the general state of anarchy in which their unfortunate country is plunged, they live in small fortified villages, surrounded by palisades and deep ditches so as to leave but two gates for a passage.

As in the feudal times, eminences strong by nature are frequently selected for the sites of these settlements, where the Batta, though removed from the more fruitful plains, cultivates his small field of mountain rice in greater security. In some districts, where hostile invasions are less to be feared, he possesses, besides his village residence, a detached hut in a forest clearance near some river navigable by canoes. To be out of the reach of wild animals or inundations, these huts are frequently built on trees whose central branches have been lopped off, while the outer ones have been left standing, so as to afford a grateful shade to the little aerial dwelling.

From this eminence, which the proprietor reaches by a ladder from twenty-five to thirty feet high, he looks down complacently upon his paddy field below, and as he is no sportsman, the undisturbed denizens of the forest afford him many a pastime. Monkeys gambol without fear on the trees around him; long-tailed squirrels leap from bough to bough; elephants bathe in the river; lemurs and fox-bats fly about in the evening; stags feed in the thicket beneath; and the only enemy he seeks to destroy is the Leguan lizard, who, intent on plundering his hen-roost, lies concealed among the reeds on the river's bank.

The Battas, having frequently suffered by foreign invasions, suspect all strangers of evil intentions, and desire to be as little as possible disturbed by their visits. For this reason, as well

as for additional security against hostile incursions, they have no roads nor bridges, and as the villages are generally many miles apart and separated from each other by jungles or woods, this total want of the means of communication presents an almost insuperable obstacle to the traveller. Their distrust of strangers extends even to the members of their own nation, so that Battas of one province cannot enter another without running the risk of being seized as spies and eaten alive.

While two of the great events of human life—birth and marriage—pass almost unnoticed among the Battas, the third and last act of this ‘strange eventful history’ gives rise to ceremonies which one would hardly expect to meet with among a nation of cannibals. When the rajah of a large village dies, his body is kept so long in the house, until the rice which is sown on the day of his death by his son or his brother comes to maturity. When the rice is about to ripen, a buffalo is killed, and its bones sent round to all friends and relations among the rajahs of the neighbourhood as an invitation to the burial, which is to take place on the tenth day after the reception of these strange missives. Every rajah who accepts the invitation is obliged to bring with him a buffalo. The coffin is placed on a bier before the house, and on the arrival of the guests their buffaloes are tied to strong poles close by. The wives, sons, and other near relations of the deceased, now walk seven times with loud lamentations round the buffaloes, after which the oldest or first wife breaks a pot of boiled rice grown from the seed sown on the dying day on the forehead of one of the buffaloes. This is the signal for a frantic explosion of grief among the mourning women, whose piercing cries are accompanied by the incessant beating of drums and brass kettles in the house. After this lugubrious scene, which soon terminates with the real or feigned exhaustion of the actors, each of the rajahs now in his turn walks seven times round the buffalo which he brought with him, and kills it with a stroke of his lance. The coffin is then removed to the burial-place, and placed on the side of the open grave, amid the profound silence of the assembly. Its lid is opened, and the eldest son of the deceased, stepping forward, looks at the corpse, the face of which is turned towards the sun, and, raising his hand to the sky, says, ‘Now, father, thou seest for the last time the sun, which thou wilt never see again.’ After this short

but affecting allocution the lid is closed and the coffin lowered into the grave, upon which the company returns to the village, where meantime the slaughtered buffaloes have been made ready for the funeral feast. Their horns, skulls, and jaw-bones, fastened to stakes, are placed as ornaments round the grave, which has no other monument or inscription. On each of the two following days some food is carried to it, a welcome treat for the dogs, and then it is consigned to the neglect which is the ultimate fate of all.

The mystical sowing of rice, and the touching words spoken at the grave, prove that the Battas, though without any fixed religious worship, have still religious feelings, and may serve to confirm the truth of the remark, that there is no nation, however barbarous, which does not show at least some traces of a belief in the Divinity, and reveal, however obscurely, that man has been born for something higher than a mere animal existence.

Among the Dyaks, a name indiscriminately applied to all the wild people on the island of Borneo, we find no less revolting customs than among the Battas of Sumatra. They are hunters of their kind, not merely for the sake of an unnatural feast, but simply for the sake of collecting heads. Skulls are the commonest ornaments of a Dyak house, and the possession of them is the best token of manly courage. A Dyak youth is despised by all the maidens of his village as long as he has not cut off the head of an enemy or waylaid a stranger; returning from a successful chase with one of these ghastly trophies, he is welcomed as a hero. The head is stuck upon a pole, and old and young dance around it, singing and beating gongs. Murder of the most revolting atrocity, which anywhere else would make its perpetrator be considered the enemy of his kind, is thus by a horrible perversity one of the elements of courtship. The same atrocious custom is found among the Harafuras of Celebes, the Nias Islanders, and some other Malay nations of the Indian Archipelago. When the Harafuras go to war, they first steal some heads, boil them, and drink the broth to render themselves invulnerable.

The Minkokas of Celebes limit the custom of taking heads to funeral or festive occasions, more especially on the death of their rajah or chief. When this occurs they sally forth, with a

white band across their forehead to notify their object, and destroy alike their enemies and strangers. From twenty to forty heads, according to the rank of the deceased rajah, being procured, buffaloes are killed, rice boiled, and a solemn funeral feast is held, and, whatever time may elapse, the body is not previously buried. The heads, on being cleaned, are hung up in the houses of the three principal persons of the tribe, and regarded with great veneration and respect.

The national weapon of the Dyaks, though not in use among all their tribes, is the Sumpitan, a blow-pipe about five feet long, with an arrow made of wood, thin, light, sharp-pointed, and dipped in the poison of the upas tree. As this is fugacious, the points are generally dipped afresh when wanted. For about twenty yards the aim is so true that no two arrows shot at the same mark will be above an inch or two apart. On a calm day the utmost range may be a hundred yards. Though impregnated with a poison less deadly than the Wourali of the American Indians, yet the shafts of the sumpitan are formidable weapons from the frequency with which they can be discharged, and the skill of those who use them. The arrows are contained in a bamboo case, hung at the side, and at the bottom of this quiver is the poison of the upas. When they face an enemy the box at the side is open, and, whether advancing or retreating, they fire the poisoned missiles with great precision.

The style of building of the Dyaks is very peculiar; most of their villages consisting of a single house, in which from fifteen to twenty families live together, in separate compartments.

The floor of these long buildings, which are thatched with palm leaves, rests on piles about six or ten feet from the ground, and the simple furniture consists of some mats, baskets, and a few knives, pots, a very primitive loom, and some dried heads by way of ornament.

Though habitual assassins from ignorance and superstitious motives, the Dyaks are said to be of a mild, good-natured, and by no means bloodthirsty character. They are hospitable when well used, grateful for kindness, industrious and honest, and so truthful that the word of one of them might safely be taken before the oath of half-a-dozen civilised Malays.

The celebrated traveller, Mrs. Ida Pfeiffer, who had the

courage to wander among the Dyaks, and the good fortune to return with her head on her shoulders, speaks highly of their patriarchal life, the love they have for their children, and the respectful conduct of the children towards their parents.

As to their personal appearance, she affirms that, though some authors describe them as fine men, they are only a little less ugly than the Malays.



CORAL ISLAND.

## CHAPTER XXI.

### THE TROPICAL OCEAN.

Wanderings of an Iceberg—The Tropical Ocean—The Cachalot—The Frigate Bird—The Tropic Bird—The Esculent Swallow—The Flying-fish—The Bonito—The White Shark—Tropical Fishes—Crustaceans—Land Crabs—Molluscs—Jelly Fish—Coral Islands.

**D**AY after day the glacier of the north protrudes its mass farther and farther into the sea, until finally, rent by the tides, and with a crash louder than that of the avalanche, the iceberg rolls into the abyss. The frost-bound waters, that have languished so many years in their Greenland prison, are now drifting to the south, on their way to the tropical ocean; but the sun must rise and set for many a day before they bid adieu to the fogs of the north.

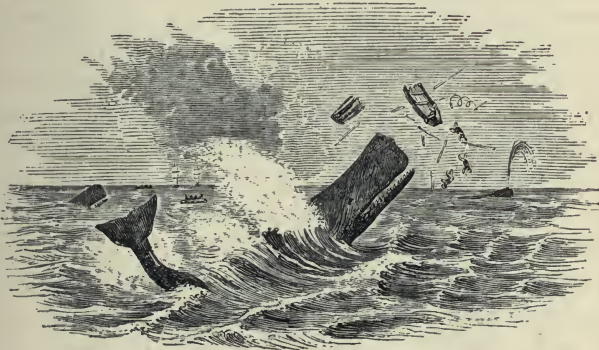
See there yon dismal ice-blocked shore, with the jagged mountains in the background, their snowy peaks rising high into the sky. Screeching sea-birds—fulmars, gulls, guillemots, auks—mix their hoarse voices with the melancholy tones of the breakers and the winds, and between them all resounds, from time to time, the bellowing of the walrus or the roar of the polar bear.

The weak rays of the sun, just dipping over the horizon, have called forth these symptoms of life; but as soon as the

great luminary disappears, animal creation becomes mute, and the voices of the air and ocean are again the only sounds which break the silence of the arctic night.

The crystal mass floats along, buried in deep darkness; but soon a new and wondrous sight is seen, for the flaming swords of the northern light flit through the heavens, casting a magic gleam, here on the desert shore, there on the dark bosom of the sea.

Advancing farther and farther to the south, the iceberg loses one after another the witnesses of its first migrations, and wasting more and more, at length entirely merges in the tepid Gulf Stream. The enthralled waters are now all liberated, but many on their western passage are again diverted to the north,



SPERM WHALE.

and the others reach, only after a long circuit, the mighty equatorial stream, which carries them along, through the torrid ocean, from one hemisphere to the other.

The animal life they meet with in these sunny regions is very different from that which witnessed their passage through the higher latitudes.

The large whalebone whale, the rorqual and narwhal of the north, have disappeared, but *pods* of the mighty sperm whale rapidly traverse the equatorial seas.

The birds also exhibit new types of being. The royal albatross avoids the torrid zone, but the high-soaring frigate-bird hovers over the waters, where it is seen darting upon the flying-fish, and, like the skua gull of the north, attacking the weaker sea-birds in order to make them disgorge their prey.

‘He is almost always a constant attendant upon our fishermen,’ says Dr. Chamberlain,\* ‘when pursuing their vocation



FRIGATE BIRD.

on the sand-banks in Kingston Harbour, or near the Palisados. Over their heads it takes its aërial stand, and watches their motions with a patience and a perseverance the most exemplary. It is upon these occasions that the pelicans, the gulls, and other sea-birds become its associates and companions. These are

also found watching with equal eagerness and anxiety the issue of the fishermen’s progress, attracted to the spot by the sea of living objects immediately beneath them. And then it is, when these men are making their last haul, and the finny tribe are fluttering and panting for life, that this voracious bird exhibits his fierce propensities. His hungry companions have scarcely secured their prey by the side of the fishermen’s canoes, when, with the lightning’s dart, they are pounced upon with such violence that, to escape his rapacious assaults they readily, in turn, yield their hard-earned booty to this formidable opponent. The lightness of its trunk, the short torso and vast spread of wing, together with its long slender and forked tail, all conspire to give it a superiority over its tribe, not only in length and rapidity of flight, but also in the power of maintaining itself, on outspread pinions, in the regions of its aërial habitations amidst the clouds; where, at times, so lofty are its soarings, that its figure becomes almost invisible to the spectator in this nether world.’

The beautiful tropic birds, whose name implies the limit of their abode—for they are seldom seen but a few degrees south or north of either tropic—hover at such a distance from the nearest land that it is still an enigma where they pass the night—whether they sleep upon the waters, or whether their extraordinary length of wing bears them to some isolated rock. Nothing can be more graceful than their flight. They glide along, most frequently without any motion of their outstretched pinions, but at times this smooth progression is interrupted by sudden jerks. When they see a ship, they never fail to sail round it, and the mariner bound to the equatorial regions hails

\* ‘Jamaica Almanac,’ 1843.

them as the harbingers of the tropics. The two long straight narrow feathers of which their tail consists, are employed by the natives of the greater part of the South Sea Islands as ornaments of dress, and serve to distinguish the chieftains from the multitude.

The esculent swallow (*Colocalia esculenta*)—whose edible nest, formed by a secretion which hardens in the air, is one of the greatest dainties of the Chinese epicure—may almost be considered as a sea-bird, as it chiefly inhabits marine caves in



ESCULENT SWALLOWS' NESTS.

various islands of the Indian Archipelago, and exclusively seeks its food in the teeming waters.

The steep sea-walls along the south coast of Java are clothed to the very brink with luxuriant woods, and screw-pines strike everywhere their roots into their sides or look down from the margin of the rock upon the sea below. The surf of ages has worn deep caves into the chalk cliffs, and here the swallow builds her nest. When the sea is most agitated, whole swarms are seen flying about, and purposely seeking the thickest wave-foam, where no doubt they find

their food. From a projecting cape, or looking down upon the play of waters, may be seen the mouth of the cave of Gua Rongkop, sometimes completely hidden under the waves, and then again opening its black recesses, into which the swallows vanish, or from which they dart forth with the rapidity of lightning. While at some distance from the coast the blue ocean sleeps in peace, it never ceases to fret and foam against the foot of these mural rocks, where the most beautiful rainbows glisten in the rising vapour.

Who can explain the instinct which prompts the birds to glue their nests to the high dark vaults of those apparently inaccessible caverns? Did they expect to find them a safe retreat from the persecutions of man? Then surely their hopes were vain, for where is the refuge to which his insatiable cupidity cannot find the way? At the cavern of Gua Gede the brink of the coast lies eighty feet above the level of the sea at ebb-tide. The wall first bends inwards, and then at a height of twenty-five feet from the sea throws out a projecting ledge, which is of great use to the nest-gatherers, serving as a support for a rattan ladder let down from the cliff. The roof of the cavern's mouth lies only ten feet above the sea, which even at ebb-tide completely covers the floor of the cave, while at flood-tide the opening of the vast grotto is entirely closed by every wave that rolls against it. To penetrate into the interior is thus only possible at low water, and during very tranquil weather, and even then it could not be done if the roof were not perforated and jagged in every direction.

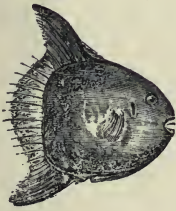
The boldest and strongest of the nest-gatherers wedges himself firmly in the hollows, or clings to the projecting stones while he fastens rattan ropes to them, which then hang four or five feet from the roof. To the lower end of these ropes long rattan cables are attached, so that the whole forms a kind of suspension bridge, throughout the entire length of the cavern, alternately rising and falling with its inequalities. The cave is 100 feet broad and 150 feet long, as far as its deepest recesses. If we justly admire the intrepidity of the St. Kildans, who, let down by a rope from the high level of their rocky birthplace, remain suspended over a boisterous sea, we needs must also pay a tribute of praise to the boldness of the Javanese nest-gatherers, who, before preparing their ladders

for the plucking of the birds' nests, first offer solemn prayers to the goddess of the south coast, and deposit gifts on the tomb where the first discoverer of the caves and their treasures is said to repose.

While traversing the tropical ocean, the mariner often sees whole shoals of flying-fishes (*Exocoetus volitans*, *Pterois volitans*) dart out of the water to escape the jaws of the bonito and the coryphæna. But while avoiding the perils of the deep, new dangers await them in the air; for, before they can drop into the sea, the frigate-bird frequently pounces upon them, and draws them head-foremost into his maw.

The bonito and coryphæna in their turn are often transpierced by the lance of the sword-fish, who, like the saw-snouted pristis, is said to engage even the sperm whale, and to put this huge leviathan to flight.

But of all the monsters of the tropical seas, there is none more dreaded by man than the white shark.



SUN FISH.



SWORD TAIL.

Woe to the sailor that falls overboard while one of these tyrants of the ocean is prowling about the ship; but woe also to the shark who, caught by a baited hook, is drawn on board, for a slow and cruel death is sure to be his lot. Mutilated and hacked to pieces, his torments are protracted by his uncommon tenacity of life.

Such, besides herds of playful dolphins, are the members of the finny creation most commonly met with on the high seas, but in general the waters at a greater distance from the land are poor in fishes. The tropical fishes chiefly abound near the coasts, in the sheltered lagoons, and in the channels which wind through numberless reefs or islands.

As the colibris dart from flower to flower in the Brazilian woods, thus the gorgeous balistinæ and glyphodons sport about the submerged coral-gardens, and enhance the brilliancy of their fairy bowers.

While these lustrous fishes belted with azure, red, and gold, defy the imagination of the poet to describe their beauty, others remind one by their deformity of the chimeras engendered by the diseased brain of a delirious patient. Here we see the hideous frog-fish creeping along like a toad upon his hand-like fin, there the sun-fish swimming about like a vast head severed from its trunk. Cased like the armadillo in an inflexible coat of mail, into which every movable part can be withdrawn, the trunk-fish derides the attack of many an enemy; and inflating its spiny body, the diodon, like the hedgehog of the land, bids defiance to his foes.

On examining the crustacean world, we find that it has established its head-quarters in the tropical zone. There a multitude of wondrous types unknown to the colder regions of the globe attract the attention of the naturalist: the transparent phyllosomas, not thicker than the thinnest wafer, and the strange sword-tails, whose body is covered by a double shield, and terminates in a long horny process, used by the Malays to point their arrows. The crabs and lobsters of the tropical waters are not only more numerous than in our colder seas, but they attain a far greater size than those of the temperate regions of the globe.

The decapod crustaceans (cray-fish) which inhabit our rivers and brooks, are long-tailed like the lobster, but in the torrid zone the river species all belong to the order of the short-tailed crabs, the most perfect and highly developed of the class. Some species even entirely forsake the water and spend their days on shore, not only on the beach, but far inland on the hills. When the season for spawning arrives, large numbers of these land-crabs set out from their mountainous abodes, marching in a direct line to the sea-shore, for the purpose of depositing their eggs, which are attached to the lower surface of the abdomen and are washed off by the surf. This done, they recommence their toilsome march towards their upland retreats, setting out after nightfall and steadily advancing until the dawn warns them to seek con-

cealment in the inequalities of the ground or among any kind of rubbish, where they lie, until the stars again invite them to pursue their course. On their seaward journey, which they prosecute so eagerly that they suffer no opposition to deter them from their purpose, they are in full vigour and fine condition, and this is the time when they are caught in great numbers



LAND CRAB.

for the table, their flesh being held in high estimation ; but on returning from the coast they are exhausted and unfit for use.

Wherever the West Indian Land Crabs make their home, their burrows are as thickly sown as those of a rabbit warren. Concealed during the greater part of the day in these subterranean abodes, they come out at night to feed, but are always ready to scuttle back at the least alarm. Should, however, their retreat be intercepted they show a bold front to the

enemy, seizing him with one of their long claws, and then shaking off the limb at its junction with the body. As the claw retains its tension for some little time after this voluntary separation, the effect is the same as if the creature were still actively biting, and while the enemy's attention is engaged with these troublesome pincers, the crab takes the opportunity to conceal itself in some crevice. As is the case with all crustaceans, a new limb soon sprouts out and repairs the loss of the discarded member.

A singular species of land decapod, called the Fighting Crab from its bellicose propensities, possesses one large and one very little claw, which gives it a very strange and ridiculous appearance, particularly when, running along at full speed, it holds the large claw in the air, and nods it continually, as beckoning to its pursuer.

The molluscs are no less profusely scattered over the tropical seas and coasts than the higher organised crustaceans. There we find those mighty cephalopods, whose long fleshy processes, as thick as a man's thigh, are able, it is said, to seize the fisherman in his boat and drag him into the sea; and there is the abode of the tridacna, whose colossal valves, measuring five feet across, attain a weight of five hundred pounds, and serve both as receptacles for holy water in Catholic churches and to collect the rain in the South Sea Islands.

The rarest and most beautiful of shells, the royal *Spondylus*, the *Carinaria vitrea*, the *Scalaria pretiosa*, the *Cypræa aurora*, and a host of *Volutes*, *Harps*, *Marginelles*, *Cones*, &c., of the most exquisite colouring, are all inhabitants of the warmer waters; and the most costly gift of the sea, the oriental pearl, is the produce of a mollusc which is found scattered over many parts of the Indian and Pacific Oceans.

On descending still lower in the scale of marine life, we find the jelly-fish disporting in the tropical waves in hosts as brilliant as the skies. Some are formed like a mushroom, others assume the shape of a belt or girdle; others are globular, while some are circular, flat, or bell-shaped; and others again resemble a bunch of berries. In colour, perhaps the most delicate is the lovely *Velella*, with its pellucid crest, its green transparent body and fringe of purple tentacles; but it is surpassed in size and gorgeoussness by the *Physalia*, or

‘Portuguese man-of-war,’ whose large air-sack, with its splendid vertical comb, shines in every shade of purple and azure. The greatest marvels of the tropical ocean are, however, beyond comparison, the wondrous buildings of the Lithophytes, or stone polyyps, the reefs and coral islands. Here we see them forming vast barriers which fringe the shores for hundreds and hundreds of miles ; there they rise in circular atolls over the blue waves, like bridal rings dropped from the heavens upon the surface of the seas. All is wonderful in these amazing constructions—their puny architects, the lagoons they encircle, the power with which they resist the most furious breakers, the little world of plants drifted over the waters, which ultimately covers them with a verdant crown, and invites man to settle on these gardens of the ocean. There the tall cocoa-palm rocks its feathered crest in the breeze, affording both shade and fruit to the islander, and there the sea-bird finds a resting-place after its wide flight over the deserts of the equatorial sea.



POLYNESIAN FISHERMEN.

## CHAPTER XXII.

### THE PAPUANS AND POLYNESIANS.

The Papuans—Their Physical and Moral Characteristics—Their Artistic Tastes—Their Dwellings—Their Primitive Political Institutions—Their Weapons and Mode of Fighting—The Polynesians—Their Manners and Customs when first visited by Europeans—Tattooing—The Tapa Cloth—Their Canoes—Swimming Feats—Aristocratic Forms of Government—The Tabu—Religion—Superstitious Observances—Human Sacrifices—Infanticide—Low Condition of the Coral Islanders.

**T**WO races of man, widely differing from each other in character, social condition, and physical conformation—the Papuans and the Polynesians—are spread over the islands of the Pacific and the archipelagoes of the Coral Sea. The Papuans who occupy the area comprising New Guinea, New Ireland, New Britannia, New Caledonia, the New Hebrides, the Solomon Group, Loyalty, and many other islands of minor importance, are in stature equal to if not surpassing the average European size. Their legs are long and thin, and their hands and feet greater than those of the Malays. The face is somewhat elongated, the forehead flat, the brows very prominent, the eyes sufficiently large and well formed, not too deeply set,

nor with the overhanging brow of the Australians; the nose large, slightly aquiline, and broad at the base; the mouth large with thick and pouting lips. The colour of the skin is commonly of a deep black-brown or black, sometimes approaching the coal-black of the genuine Negro races.

The growth of the hair is very peculiar, and at first sight might be confounded with the wool of the negro. Its distribution is most easily seen on the body and limbs, when it may be observed to grow in small tufts or pencils, separated one from the other, and giving a blotchy or woolly aspect to the skin. The hair of the head doubtless grows in the same way, but here the tufts are close together, and each forms a separate small curl, very stiff, and when suffered to grow long hangs down in a narrow pipe-like ringlet. The fashion of dressing the hair varies in different localities, but generally the greatest care is bestowed upon it. The face of the Papuans has upon the whole a more European expression than that of the Malays, and the prominent nose, the strongly marked eyebrows, and the character of the hair enable one at once to distinguish these two races from each other.

The difference in their moral characteristics is no less remarkable.

The Papuan is impulsive and demonstrative in his language and actions. His passions and emotions express themselves in screaming and laughing, in howling and jumping. The women and children take part in every conversation, and show no fear at the sight of strangers and Europeans. The Malay is timid, cold, quiet; the Papuan bold, impetuous, and noisy. The former is serious, and seldom laughs; the latter is jovial, and loves a joke: the one hides his emotions, the other shows them openly.

It is difficult to form an opinion of the intelligence of the Papuans, but Mr. Wallace is inclined to place it on a somewhat higher level than that of the Malays, although the latter, influenced for centuries by the immigration and intercourse with Hindoos, Chinese, and Arabs, have made some progress in civilisation, while the former, communicating but little with the rest of the world, are still plunged in barbarism. The Papuan has much more vital energy, which certainly would materially aid his intellectual development were he placed in more

favourable circumstances. He combines a remarkable taste and skill in the ornamenting of his furniture with an utter disregard of all order and convenience in his household arrangements. He has no chair or bench to sit upon, does not know the use of a brush, and his dress, such as it is, consists of dirty bark or rags. He never takes the trouble to clear the path which he daily treads, of overhanging branches or prickly thorns. In many parts his nourishment consists almost entirely of roots and vegetables; fish and game being only occasional luxuries; and in consequence both of his coarse food and his filthy habits, he is very liable to various cutaneous diseases. The children, particularly, have often a miserable look, and are covered over their whole body with eruptions and sores. If these people are not savages, where are we to look for them? And yet these same savages have a decided taste for the fine arts, and employ their leisure hours in executing ornamental works, the neatness and elegance of which would often do honour to our schools of design.

They cover the outside of their houses with rude but characteristic figures, and their canoes, and other implements and furniture are decorated with elaborate carvings in various patterns; a custom very seldom met with among the Malayan tribes.

But the most striking instance of Papuan industry, and the one which seems most at variance with their utter barbarism in almost every other respect, is shown in the construction of the immense houses in New Guinea which strike the stranger with astonishment. They are upwards of 300 feet long, about 30 feet in width, and 16 or 18 feet high in the centre, from which the roof slopes down on either hand to the floor; their inside looks just like a great tunnel. Down each side are a row of cabins with walls of bamboo and neatly made doors. Inside these cabins are low frames covered with mats, apparently bed-places, and overhead are shelves and pegs for bows and arrows, baskets, stone axes, and other utensils. These immense structures rest on a number of posts, like the ancient lacustrine habitations of Switzerland, so that their floor is raised from the muddy ground about six feet. The roof, formed of an arched framework of bamboo, is covered with a perfectly waterproof thatch of sago-palm leaves. The centre of the house for about a

third of its width is kept quite clear, forming a noble covered promenade, though rather dark, as the only light proceeds from the large doors at the end and the little side doors between the cabins.

Most accounts describe the honesty of the Papuans as superior to that of the Polynesian race, and they seem to be less eagerly addicted to pilfering; they are, however, commonly much more hostile and ferocious, sometimes waging open warfare, sometimes having recourse to the grossest treachery. Travellers mention them honourably for the treatment of their women. Mr. Jukes never saw a woman beaten or abused among the Torres Straits Islanders, and in all the harder kinds of work the men appeared to take their fair share of labour. Their care and affection for their children seemed always great. Although wanting in the engaging liveliness and fascinating manners of some of the eastern Polynesian nations, they are of a cheerful disposition, readily engaging in sports and amusements, and their curiosity is easily excited by anything interesting or uncommon. When bartering with Europeans they show their good sense in preferring useful articles to mere ornaments.

The political institutions of the Papuans are extremely primitive. We do not hear of any division into ranks or of any hereditary chieftainship or authority among them. They apparently live in small tribes, hostile the one to the other. They have never attained to any great skill in navigation. Their canoes are commonly small, rudely fashioned, and unfit to encounter the swell of the open sea. Their agriculture is very rude and they seem in no instance to cultivate rice or any other sort of grain. No genuine Papuan nation has been known to have invented or practised the art of making any kind of cloth. Their favourite weapons are the bow and arrow, in the use of which they are very expert, but they appear never to have acquired anything like discipline or skill in warfare, although apparently more constantly engaged in it than the Polynesians.

Of their mode of fighting, the following account of a skirmish witnessed by Mr. Jukes gives us a good idea. 'The hostile parties approached each other at full speed to within about thirty or forty yards, when they both halted, sheltering

themselves behind rocks and large stones; and there was a pretty brisk interchange of arrows. The sharp twanging or smacking of the bows, the rattling of bundles of arrows and the hurtling of arrows through the air, and their glancing from the rocks, was heard above the shouts and cries of the combatants. The fierce gestures, quick and active movements, and the animated attitudes of the black and naked warriors, ornamented, as many of them were, with glittering pearl shells or red flowers and yellow leaves hanging from their hair, and the crouching of the women, known by their petticoats, in the rear or skirts of the battle with fresh stores of ammunition, formed for a short time an interesting and exciting spectacle. After a minute or two's skirmishing they all rushed together, hand to hand, and formed a confused mob. The shouting and noise was then redoubled, and there was a short clatter of long poles, sticks, or canoe paddles, which we could see waving above their heads, and we thought some of them were using their arrows as spears or daggers. Still no execution seemed to be done, as we saw none of them down, and in a very short time the poles and paddles were all held erect, the women closed up, and the war of deeds seemed to end in one of words. The fight being done, both parties seemed very glad it was over. Several of the combatants were slightly scarred with arrow marks, but in some cases had evidently had a very narrow escape. It seemed as if they had seen the arrow coming and avoided it by twisting the body as the Australians avoid spears.'

As to the future prospects of the Papuan race, there can hardly be a doubt that as soon as they come within the range of European emigration or dominion, their speedy extinction must be the result. Their very qualities will seal their doom, for a warlike and energetic people will never quietly submit to the yoke of a foreign master, and must as surely disappear before the white man as the wolf or the tiger.

With the single and remarkable exception of the Feejee Islanders, who form a kind of intermediate race between the Papuan and Polynesian races, all the archipelagoes and islands of the tropical Pacific, situated on the east and north of the above-mentioned groups, are inhabited by nations distinguished from the Papuan stock by a yellow, olive-coloured, or brown skin; by smooth, generally black, hair; by a finer

proportioned body, with well-rounded limbs and swelling muscles. The nations belonging to this yellow or Polynesian race have in general attained a much higher degree of civilisation than the black hordes of the western islands; and though enormous distances intervene between them, the inhabitants of the large groups of the Sandwich, Society, Navigators, and Friendly Islands, are more similar to each other than the various nations crowded together in the comparatively narrow space of our continent. Their features are everywhere the same; they speak dialects of the same language, so nearly resembling each other that the people of Tonga can freely converse with those of Hawaii; and when first visited by European navigators they showed a surprising similarity in their customs, their religious observances, and their political institutions, as well as in the progress they had made in agriculture and the industrial arts.

Not satisfied with the spontaneous bounty of Nature, they forced the willing soil to yield them a variety of productions. The Tahitians, besides multiplying the bread-fruit tree and the cocoa palm, chiefly cultivated the banana, the sweet potato, and the yam; while the roots of the taro formed the principal nourishment of the Sandwich Islanders, who by an admirable system of irrigation extended the plantations of this water-loving plant, even high up the hills, where it grew in artificial ponds. These served likewise as basins for the reception of mullets, which were taken when quite young out of the sea, and placed in reservoirs into which some sweet water was made to flow. They were then gradually accustomed to water less and less salt, and ultimately, after five or six weeks, transferred to the submerged taro plantations, where they grew to a large size, and acquired a delicious flavour.

The food of the common people in all these islands consisted entirely of vegetables: pork, and the flesh of dogs, which was particularly esteemed, being exclusively reserved for the use of the great. This taste seems strange, but as the dogs destined for the table were fed wholly upon bread-fruit, cocoa-nuts, and other vegetables, their flesh was but little inferior to English lamb, and might well pass for a delicacy in a country where beef, mutton, and venison were unknown. The general drink was water or the milk of the cocoa-nut, but on festive occasions

they prepared an intoxicating beverage called Kava from the root of a species of pepper.

Both men and women were dressed in Tapa, a kind of white cloth, which was not woven, but made like paper, of the macerated fibres of the bark of the Chinese mulberry and bread-fruit trees spread out and beaten together. The lower classes wore but a scanty covering of this material, while the nobles were amply attired in long and flowing garments, stained with various colours.

When even the rude Australian shows some desire to decorate his ugly person by sticking a bone through his nostrils, or by bedaubing his filthy body with paint, we cannot wonder at the taste for ornament displayed by the more polished South Sea Islanders. Elegant chaplets, of gaily-coloured feathers, adorned their raven hair, and flowers in the ears gratified at once the eye by their lively hues, and the smell by their delicious perfume.

The custom of tattooing so frequent among the Malays, and even among the Negroes and American Indians, was nowhere so universally and so elaborately practised as among the South Sea islanders. Each group had its particular patterns, each rank was differently marked. The instrument used for this painful operation was a kind of comb, the teeth of which were struck just through the skin, after which the punctures were rubbed with a kind of paste made of soot and oil which left an indelible stain.

The industrial dexterity of this ingenious people appeared in the manufacture of many other articles besides the Tapa. Rushes, grass, the bark of trees, and fibrous leaves furnished the material for finer mats than any made in Europe. The coarser kind of matting was employed for sleeping on in the night, or sitting on through the day; the finer sort was converted into garments in rainy weather, the Tapa being soon penetrated by wet. They were also very expert in making basket and wicker work; their baskets were of a vast number of different patterns, many of them exceedingly neat, and the making of them was an art practised by everyone, both men and women. Essentially maritime in their tastes, they excelled in the construction of their canoes, which were the more to be admired as an adze made of stone, a chisel or gouge

made of bone, a rasp of coral, and the skin of a sting ray as a file and polisher, were the only tools which they possessed. With these rude implements they generally took up several days in felling a tree, which was then split into planks. The boards, having been very dexterously smoothed, were afterwards fitted to the boat with the same exactness that might be expected from an expert joiner.

To fasten them together, holes were bored with a piece of bone fixed into a stick for that purpose, and through these holes a kind of plaited cordage was passed, so as to hold the planks strongly together. The seams were caulked with dry rushes, and the whole outside of the vessel was painted over with a kind of gummy juice which supplied the place of pitch. Considering the inferiority of their tools, the building of one of their large war canoes, which sometimes had the enormous length of 108 feet and could hold forty men, was undoubtedly a piece of workmanship not inferior to the huge vessels constructed in Europe with the assistance of iron. Generally two of these war canoes were lashed together, with two masts set up between them, and a high platform raised above, on which the warriors, armed with spears and slings, were stationed; the rowers sat below, ready to receive the wounded from above and to send reinforcements to take their place. Single boats had an outrigger on one side, and only one mast in the middle; and in these frail constructions, they did not hesitate to sail far beyond the sight of land, shaping their course in the daytime by the sun, at night by the stars, to which they gave their particular names.

A fleet of war canoes with its curved figures, its waving pennants, and its men gracefully clothed in flowing garments, afforded a highly picturesque spectacle, which might give some idea of the vessels in which the Argonauts sailed to Colchis, or the Homeric heroes embarked for the destruction of Troy.

Accustomed to bathe from infancy, the half-amphibious South Sea Islanders are admirable swimmers. Captain Cook was amazed at the natatorial expertness of the Tahitians in a tremendously high surf, in which the best European swimmer would have been drowned, as the shore was covered with pebbles and large stones. Whenever a huge wave broke near

them they dived under it and rose again on the other side. The stern of an old canoe added much to their sport. This they took out before them, and swam as far as the outermost breach in the reef, through which the sea came pouring in; when two or three getting into it and turning the square end to the breaking waves, were driven in towards the shore with incredible rapidity, sometimes almost to the beach, but generally the wave broke over them before they got half-way, in which case they dived and rose to the other side with the canoe in their hands and swimming out with it again were again driven back.

On the border of the reef of the island of Huaheini, Ellis frequently saw more than a hundred persons of all ages play like dolphins in the rolling breakers, sometimes riding on the crest of a wave and nearly enveloped with foam, and then again disappearing under the billows, which rolled like mountains above them.

The dwellings of the South Sea Islanders were small huts built under the shade of bread-fruit trees or cocoa palms, and open at the sides, so as to allow a free entrance to the cooling breeze—a great enjoyment in a climate blessed with a perpetual spring. A strong thatch of palm leaves effectually kept out the rain, and the floor was covered with hay, over which they spread mats to sleep on, this being the chief use to which their simple constructions were devoted, for, unless it rained, they ate and performed all their work in the open air.

The form of government in the large Polynesian groups was monarchical and aristocratic. When Captain Wallis first landed on Tahiti, a queen reigned over the beautiful island, and when Cook discovered the Sandwich Archipelago a succession of kings had long ruled over Hawaii. The genealogy of the great nobles was traced back as far as the remotest periods of their legendary history, and in some islands the kings, as in the old times of Greece, derived their origin in a direct line from the gods, so that religion lent its aid to secure their authority by the prestige of birth. Their person was sacred, none of the lower classes was allowed to touch them, and he who should have ventured to cast his shadow over their path would have been punished with death. Whenever the king or queen appeared in public, they were always carried on the shoulders of men, whose honourable office exonerated them from

all other labour. In this manner they travelled full speed at the rate of more than five miles an hour. Other carriers, with a considerable retinue, ran alongside for the relief of their tired comrade, and at each relay royalty never placed its foot upon the ground, but vaulted over the head of the exhausted carrier upon the shoulders of his successor, who instantly proceeded on his journey at a sharp trot.

In the Friendly Archipelago the Tui Tonga, a sacred personage descending in a direct line from one of the chief Polynesian gods, enjoyed divine honours, which were paid him not only by his countrymen, but even by part of Samoa and the Feejee Islands. The highest nobles were obliged to sit down when he passed; a mark of reverence which they themselves exacted from the meanest peasant.

An etiquette as severe and circumstantial as that which prescribes the courtly forms existing among the most civilised people of Asia or Europe, served to maintain the wide line of demarcation which separated the lords of the land from the common artisans and cultivators of the soil: and the strange superstition of the Tabu, one of the most effectual instruments of government ever invented by man, still further secured the willing obedience of the people.

In general the Tabu signified a prohibition. It interdicted the visiting of certain spots, the use of certain articles of food, the touching of certain objects, the use of certain words, the performance of certain actions, and he who, for instance, touched the dead body of a chieftain was subjected during several months to a tabu, and was then not allowed to carry his victuals to his mouth with his own hands. When hungry and no one near at hand to feed him, he was obliged to creep on all fours and seize his victuals with his lips.

The Tabu spread its influence over every occurrence of life. It was political or religious, general or individual, of limited duration or perpetual. Sometimes it proceeded from the whim of a chieftain, or the caprice of a priest; sometimes it appeared as a measure of general utility, and then again as a protection for individual property; sometimes it extended over a whole people, and in other cases was limited to a single individual. Its yoke lay particularly heavy on the women, whom it deprived of many enjoyments, and subjected to many irksome restric-

tions. But, though frequently tyrannical and oppressive, it often performed the salutary part of our laws and police regulations, with this difference, however, in its favour: that whereas many of us are, more or less, inclined to infringe the law, no Polynesian would have ventured to disobey the Tabu, being perfectly convinced that this crime would immediately entail upon him the signal vengeance of his gods. Every chieftain had the right to subject his inferiors to a Tabu, and was in a like manner obliged to submit to the interdictions pronounced by his superior. If by some chance he had infringed a Tabu, he could only be exonerated by a chieftain of higher rank. Thus the Tabu placed an enormous power in the hands of the privileged castes, and secured by the chains of superstition the eternal slavery of the people.

As among the ancient Greeks an invisible world of gods ruled over the visible phenomena of nature, thus also the fertile fancy of the Polynesians peopled earth and heaven, the ocean and the mountains with a mighty host of spirits. They recognized their presence in the rising sun, the mild moonlight, the howling storm, the roaring breaker, and the soft evening breeze. The peak of the mountain, the fleecy vapours hanging on its side, the foaming waterfall, and above all the volcano and the earthquake, were all palpable objects, connected with a presiding divinity. Most of these gods were vindictive, proud, irascible beings, ever ready to do mischief in a material or immaterial form; and even the spirits of deceased relations were feared as malignant demons. Thus, here as elsewhere, superstition added its fantastical terrors to the real evils of existence.

The Polynesian Pantheon, a strange mixture of poetry and absurdity, was as richly peopled as that of the ancient Greeks or Scandinavians. Tangaloa was the creator of their little world, which, according to the Tonga account, he fished up from the sea. Tahiti was the first part that appeared. Just as its rock showed above water, the line broke. However, the rock in which the hook stuck could still be seen on the island of Hoonga, and the family of Tuitonga were in possession of the hook. In Tahiti and Samoa the workman was the same, but the work different. The Tahitian Tangaloa formed the ocean from the sweat of his brow—so hard did he work in making the land.

The Samoan sent down his daughter Toli in the shape of a snipe to survey the world below. As she saw nothing but sea, her father rolled down a stone, which became one island, and another which became a second, and so on. The first growth of such islands was wild vine. They were pulled out of the ground and heaped up to rot, so that worms were produced. Out of these worms grew men and women.

Oro, the god of war, was the mighty protector of Tahiti. His father, Taaroa, was the son of night, for here also, as among the Greeks, all originally proceeded from darkness.

Hiro, the Polynesian Neptune, likewise played a considerable part in legendary lore. Once the monsters of the deep had lulled him with a profound sleep while the god of winds raised a terrible storm to destroy a vessel in which his friends were embarked. Their destruction seemed inevitable, but a good spirit penetrated into the sea-grot where the god was dozing, awoke him from his slumbers, and told him of the danger his followers were in. Instantly he rose to the surface, where his presence scared away the weaker storm-god, and his friends were saved.

In the Sandwich Islands, the chief divinities resided in the burning craters of Mauna Loa, for no phenomenon of nature was equal in terrific grandeur to these explosions of subterranean fire, and the mysterious powers which caused them were necessarily prominent in power. There dwelt Pele the supreme goddess of fire, with a whole train of subordinate deities, such as Kamoho 'the king of steam,' Teoahitamata 'the fire-spitting son of war,' Hiatawawahilani 'the sky-rending cloud-compeller.' The roar of the volcano was the music to which their deities danced, their delight was to swim in the waves of the fiery sea. Never did these dreadful beings leave their abodes for a beneficial purpose, but only to receive offerings or to wreak vengeance: the quaking of the earth, the outpouring lava stream announced their coming. This religion of dread placed of course an enormous power in the hands of the priests, who profited largely by the terrors of a credulous people.

As in Greece, the divinities of the Polynesian Pantheon were worshipped under the palpable form of idols in large temples, or inclosures; but while Apollo or Jove fashioned by the hand of a Phidias or Scopas still command the admiration of a world

which has long since ceased to believe in them, the rude figures which the Tahitian or the Hawaiian adored were models of hideous deformity.

Like the ancient Greeks, the Polynesians had also their Elysium. The higher gods, and the souls of kings, chiefs and councillors, resided in a happy island, more beautiful than any on earth; but the common people were excluded from this abode of felicity, as they have been debarred from all political rights in life. The idea of a retributive justice had no room in the Polynesian mind, and birth claimed its privileges even after death, while merit was ignored.

To judge by their progress in the industrial arts, their elaborate political institutions, and the courtesy of their manners, the South Sea Islander, particularly the Tahitians, might claim a place among civilized nations, but in many respects they were still deeply plunged in barbarism. Their wars were sanguinary and cruel, their morals dissolute. Infanticide was extremely common among them, and the cause of this horrible crime was not the want of food but a culpable laziness. Although the fertility of the soil and the mildness of a delicious climate rendered it easy to provide for a large family, the general indolence was so great that a man with more than three children (a rare case) was looked upon as groaning under an intolerable burden, and thus thousands of infants were immolated to the love of ease of their unnatural parents.

Human sacrifices were frequently offered to propitiate the gods—in war time, on the occasion of some great festival, of the illness or coronation of a king, or at the building of a temple. Each of the pillars which sustained the roof of one of these edifices was planted in the body of a wretch immolated in honour of the cruel divinity to whom the building was consecrated. To the honour of Polynesian humanity it must, however, be added, that the victims—either prisoners of war or persons who had incurred the enmity of some priest or noble—were not made to suffer any additional torment, but suddenly despatched by the unexpected blow of a club.

In all the larger Polynesian groups the state of society briefly described in the foregoing pages has long since disappeared.

In Hawaii, Tahiti, Tonga, and Samoa, the ancient religion, the ancient customs, the ancient manufactures have more or less given way to European influences, and now only exist in the more remote or more insignificant islands where the missionary has either not appeared or which are too poor to tempt our avarice.

The difference between the geological structure of the different islands of the Pacific has a marked influence upon the condition of their inhabitants. In the high and more extensive islands, where the structure is primitive and volcanic, the productions of the soil are more abundant and various, and the conditions for social development more favourable, than in the low small islands of a coralline structure, where food is less abundant, the sun more scorching, and generally the complexion of the inhabitants darker.

While the Tahitians, Sandwich Islanders, Samoans, and Fijians cultivate the taro plant or pluck the fruits of the bread-fruit tree, the coral islander is frequently restricted to the nuts of the cocoa palm, or even to those of the screw pine, and adds to his sparing vegetable meal only a few crabs or fishes which he gathers on the reef or catches in the lagoon.

On some of the low Caroline Islands, whose inhabitants undertake long sea voyages, the ideas of the people have naturally a somewhat wider range; but in general the poverty of the language corresponds with the narrow circle of a life confined to so small a space and to so few objects of interest.

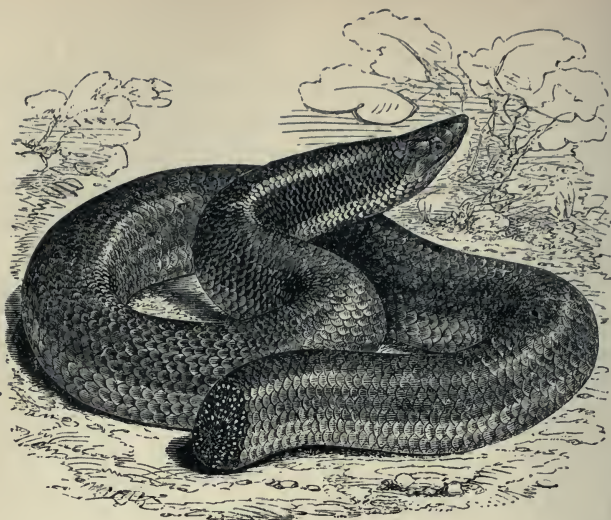
The inhabitants of Hau or Bow Island, situated in the centre of the extensive Paumotu group, give us a good idea of the dreary monotony of a coral islander's life. Captain Beechey, who visited them in 1826, describes them as an ill-favoured, indolent race, above the middle size, with strong bones but flaccid muscles. The ugliness of the men was surpassed by that of the women, who were obliged to work in the hot sun while their lazy lords and masters looked on, reclining in the shade. Having obtained the chief's permission to fell some wood, he endeavoured to procure the natives' assistance by liberal offers of tobacco and shirts, but in spite of this tempting salary the chief was the only man among them who could be roused from his lethargy and induced to work, and even he let the axe drop before the first tree was felled.

With the aid of an interpreter, Captain Beechey learned many interesting particulars about these islanders during his four days' sojourn among them. They had, as they said, given up cannibalism some time ago; but, to judge by the diabolical animation which spread over the chief's brutal countenance as he described the excellent flavour of human flesh, there is every reason to believe that they were in great danger of a relapse. These savages preferred eating their victuals raw, and were thus in fact but one degree removed from that horrid custom. A canoe full of fish having landed in the neighbourhood of the village, they immediately devoured the whole cargo, leaving nothing but the bones and fins. Their marriage ceremonies were as simple as possible: a man had only to say to a woman 'Thou shalt be my wife!' and, provided she was not pre-engaged, no further ceremony was required. The children seemed to be the only objects for which the men showed any affection; the women at least came in for no share of it. While the men stretched their lazy limbs in the shade, these unfortunate creatures were obliged to gather shell-fish on the pointed coral reefs, or to seek for pandanus nuts in the woods. They went to this work at break of day, and on returning from their morning's labour had no time to rest, but were obliged to serve their hungry masters, who first devoured the best part of the fleshy substance inclosed in the rind of the nuts and then threw the rest to the women as we should throw a bone to a dog. After this, the women cracked the nuts with a heavy stone in order to extract the four or five small kernels about the size of an almond which they contain, and which were laid aside for the men. As a great number of nuts was necessary to satisfy their voracious appetite, the women were in fact occupied all day long in gathering mussels, sea-urchins, and pandanus nuts, and cracking the latter.

The supremacy of the stronger sex was asserted with the utmost severity, and nowhere did the tyranny of man show itself in a more contemptible light. Once a poor woman, fancying herself unobserved, ventured to eat a few kernels of the nuts she had fetched from a great distance, but unfortunately did not escape the vigilant eye of her brutal husband, who immediately rose and knocked her down. Thus overworked and debased by ill-treatment, we cannot wonder if the

females possess none of those qualities and graces which render women in Europe so charming.

Truly, even in the wildest regions of the earth, it would be difficult to find a spot still less adapted to the moral and intellectual improvement of its inhabitants than a coral island, despite its cloudless sky, its waving palm trees, its azure lagoon, and the magnificence of the sea hurling its snow-white breakers against the reef.



THE UROPELTIS PHILIPPINUS.

## CHAPTER XXIII.

### SNAKES.

First Impression of a Tropical Forest—Exaggerated Fears—Comparative rareness of Venomous Snakes—Their Habits and External Characters—Anecdote of the Prince of Neu Wied—The Bite of the *Trigonocephalus*—Antidotes—Fangs of the Venomous Snakes described—The Bush-master—The *Echidna Ocellata*—The Rattlesnakes—Extirpated by Hogs—The *Cobra de Capello*—Indian Snake-Charmers—Maritime Excursions of the *Cobra*—The Egyptian Haje—The *Cerastes*—Boas and Pythons—The *Jiboya*—The *Anaconda*—Enemies of the Serpents—The Secretary—The Adjutant—The Mongoos—A Serpent swallowed by another—The Locomotion of Serpents—Anatomy of their Jaws—Serpents feeding in the Zoological Gardens—Domestication of the Rat-Snake—Water-Snakes.

ON penetrating for the first time into a tropical forest, the traveller is moved by many conflicting emotions. This luxuriance of vegetation revelling in ever-changing forms, these giants of the woods clasped by the python-folds of enormous creepers, and bearing whole hosts of parasites on their knotty arms; this strange and unknown world of plants, harbouring in its impenetrable recesses a no less strange and unknown world of animals, all unite in filling the soul with pleasurable excitement; and yet the heart is, at the same time, chilled with

vague fears, that mix like a discordant sound with the harmonies of this sylvan world. For in the hollows of the tangled roots and in the dense underwood of the forest a brood of noxious reptiles loves to conceal itself, and who knows whether a snake, armed with poisonous fangs, may not dart forth from the rustling foliage.

Gradually, however, these reflections wear away, and time and experience convince one that the snakes in the tropical woods are hardly more to be feared than in the forests of Germany or France, where also the viper will sometimes inflict a deadly wound. These reptiles are, indeed, far from being of so frequent occurrence as is generally believed; and on meeting with a snake, there is every probability of its belonging to the harmless species, which show themselves much more frequently by day, and are far more numerous. Even in India and Ceylon, where serpents are said to abound, they make their appearance so cautiously that the surprise of long residents is invariably expressed at their being so seldom seen.

Sir E. Tennent, who frequently performed journeys of two to five hundred miles through the jungle without seeing a single snake, never heard, during his long residence in Ceylon, of the death of a European being caused by the bite of one of these reptiles; and in almost every instance accidents to the natives happened at night, when the animal, having been surprised or trodden on, had inflicted the wound in self-defence. Thus, to avoid danger, the Singhalese, when obliged to leave their houses in the dark, carry a stick with a loose ring, the noise of which, as they strike it on the ground, is sufficient to warn the snakes to leave their path.

During his five years' travels through the whole breadth of tropical America, from the Atlantic to the Pacific, M. de Castelnau, although ever on the search, collected no more than ninety-one serpents, of which only twenty-one were poisonous; a proof that they are not more frequently met with in the primitive forests of Brazil than in the jungles of India or Ceylon.

The habits of the venomous snakes, and the external characters by which they are distinguished from the harmless species, likewise tend to diminish the danger to be apprehended from them. Thus, their head is generally flat, broad, lanceo-

late ; they have an aperture or slit on each cheek, behind the nostrils, and an elongated vertical pupil like many other nocturnal animals.

They are also generally slower and more indolent in their motions, and thus are more easily avoided. No venomous snake will ever be found on a tree, and on quietly approaching one in the forest or in the savannah, it will most likely creep away without disputing the path, as it is not very anxious uselessly to squander the venom which Nature gave it as the only means for procuring itself food.

‘There is not much danger in roving amongst snakes,’ says Waterton, who, from spending many a month in tropical wilds, may justly be called an excellent authority, ‘provided only that you have self-command. You must never approach them abruptly ; if so, you are sure to pay for your rashness ; because the idea of self-defence is predominant in every animal, and thus the snake, to defend himself from what he considers an attack upon him, makes the intruder feel the deadly effect of his envenomed fangs. The labarri snake is very poisonous, yet I have often approached within two yards of him without fear. I took care to advance very softly and gently, without moving my arms, and he always allowed me to have a fine view of him, without showing the least inclination to make a spring at me. He would appear to keep his eye fixed on me, as though suspicious, but that was all. Sometimes I have taken a stick ten feet long and placed it on the labarri’s back ; he would then glide away without offering resistance. However, when I put the end of the stick abruptly to his head, he immediately opened his mouth, flew at it, and bit it.’ But although accidents from venomous snakes are comparatively rare, yet the consequences are dreadful when they do take place, and the sight of a cobra or a trigonocephalus preparing for its fatal spring may well appal the stoutest heart.

Prince Maximilian of Neu Wied, having wounded a tapir, was following the traces of his game along with his Indian hunter, when suddenly his companion uttered a loud scream. He had come too near a labarri snake, and the dense thicket prevented his escape. Fortunately the first glance of the distinguished naturalist fell upon the reptile, which with extended jaws and projecting fangs was ready to dart upon the Indian,

but at the same moment, struck by a ball from the prince's rifle, lay writhing on the ground. The Indian, though otherwise a strong-nerved man, was so paralysed by fear, that it was some time before he could recover his self-possession—a proof, among others, that it is superfluous to attribute a fascinating power to the venomous snakes, as the effects of terror are quite sufficient to explain why smaller animals, unable to flee the impending danger, become their unresisting victims, and even seem, as it were, wantonly to rush upon destruction. Thus Pöppig saw on the banks of the Huallaga an unfortunate frog, which, after being for some time unable to move, at length made a desperate leap towards a large snake that was all the time fixing its eye upon it, and thus paid for the confusion of its senses with the loss of its life.

A poor Indian girl that accompanied Schomburgk on his travels through the forests of Guiana was less fortunate than the Prince of Neu Wied's companion. She was bitten by a *trigonocephalus*, and it was dreadful to see how soon the powers of life began to ebb under the fatal effects of the poison. The wound was immediately sucked, and spirits of ammonia, the usual remedy, profusely applied both externally and inwardly, but all in vain. In less than three minutes, a convulsive trembling shook the whole body, the face assumed a cadaverous aspect, dreadful pains raged in the heart, in the back, less in the wound itself; the dissolved blood flowed from the ears and nose, or was spasmodically ejected by the stomach; the pulse rose to 120–130 in the minute; the paralysis which first benumbed the bitten foot spread farther and farther, and in less than eight minutes the unfortunate girl was no longer to be recognised. The same day the foot swelled to shapeless dimensions, and she lay senseless until, after an agony of sixty-three hours, death relieved her from her sufferings.

A great many antidotes have been recommended against serpentine poison, but their very number proves their inefficacy. One of the most famous is the juice of a Peruvian climbing plant, the *vejuco de huaco* (*Mikania Huaco*, Kunth), the remarkable properties of which were first discovered by a negro, who observed that when the huaco, a kind of hawk which chiefly feeds on snakes, has been bitten by one of them, it immediately flies to the *vejuco* and eats some of its leaves.

It is a well-known fact that serpentine poison may be swallowed with impunity; it shows its effects only on mixing directly with the blood. A tight ligature above the wound, along with sucking, burning, or cutting it out, are thus very rational remedies for preventing the rapid propagation of the venom. Suction is, however, not always unattended with danger to the person who undertakes the friendly office. Thus Schomburgk relates the misfortunes of a poor Indian, whose son had been bitten in the cheek. The father instantly sucked the wound, but a hollow tooth conveyed the poison into his own body. His cheek swelled under excruciating pains, and without being able to save his son, his own health and vigour were for ever lost. For such are the dreadful consequences of this poison, that they incurably trouble the fountains of life. The wound generally breaks open every year, emitting a very offensive odour, and causes dreadful pains at every change of the weather.

Although all the venomous snakes produce morbid symptoms nearly similar, yet the strength of the poison varies according to the species of the serpent, and to the circumstances under which it is emitted. It is said to be most virulent during very hot weather, when the moon changes, or when the animal is about to cast its skin. The effects are naturally more powerful and rapid when a larger quantity of poison flows into the wound, and a snake with exhausted supplies from repeated bitings will evidently strike less fatally than another whose glands are inflated with poison after a long repose.

Before describing some of the most conspicuous of the venomous serpents, a few words on the simple but admirable mechanism of their delicate but needle-like fangs will not be out of place. Towards the point of the fang, which is invariably situated in the upper jaw, there is a little oblong aperture on the convex side of it, and through this there is a communication down the fang to the root, at which lies a little bag containing the poison. Thus, when the point of the fang is pressed, the root of the fang also presses against the bag and sends up a portion of the poison it contains. The fangs being extremely movable, can be voluntarily depressed or elevated; and as from their brittleness they are very liable to break, Nature, to provide for a loss that would be fatal, has added behind each of them

smaller or subsidiary fangs ready to take their place in case of accident.

Unrivalled in the display of every lovely colour of the rainbow, and unmatched in the effects of his deadly poison, the bush-master or counacutchi (*Lachesis rhombeata*) glides on, sole monarch of the forests of Guiana or Brazil, as both man and beast fly before him. In size he surpasses most other venomous species, as he sometimes grows to the length of fourteen feet. Generally concealed among the fallen leaves of the forest, he lives on small birds, reptiles, and mammalians, whom he is able to pursue with surprising activity. Thus, Schomburgk once saw an opossum rushing through the forest, and closely followed by an enormous bush-master. Frightened to death and utterly exhausted, the panting animal ascended the stump of an old tree, and thence, as if rooted to the spot, looked with staring eyes on its enemy, who, rolled in a spiral coil, from which his head rose higher and higher, slowly and leisurely, as if conscious that his prey could not possibly escape him, prepared for his deadly spring. This time, however, the bush-master was mistaken, for a shot from Schomburgk's rifle laid him writhing in the dust, while the opossum, saved by a miracle, ran off as fast as he could. Fortunately for the planter and negroes, the bush-master is a rare serpent, frequenting only the deepest shades of the thicket, where in the day-time he generally lies coiled upon the ground.

Still rarer, though if possible yet more formidable, is a small brown viper (*Echidna ocellata*), which infests the Peruvian forests. Its bite is said to be able to kill a strong man within two or three minutes. The Indian, when bitten by it, does not even attempt an antidote against the poison, but stoically bids adieu to his comrades, and lays himself down to die.

The ill-famed wide-extended race of the rattlesnakes, which ranges from South Brazil to Canada, belongs exclusively to the New World. They prefer the more elevated, dry, and stony regions, where they lie coiled up in the thorny bushes, and only attack such animals as come too near their lair. Their bite is said to be able to kill a horse or an ox in ten or twelve minutes; but, fortunately, they are afraid of man, and will not venture to attack him unless provoked. When roused to anger they are, however, very formidable, as their fangs penetrate through

the strongest boot. One of the most remarkable features of their organisation is a kind of rattle terminating the tail, and consisting of a number of pieces inserted into each other, all alike in shape and size, hollow, and of a thin, elastic, brittle substance, like that of which the scales are externally formed. When provoked, the strong and rapid vibratory motions imparted to the rattle produce a sound which has been compared to that of knife-grinding, but is never loud enough to be heard at any distance, and becomes almost inaudible in rainy weather.



RATTLESNAKE.

Naturalists distinguish at least a dozen different species of rattlesnakes, the commonest of which are the Boaquira (*Crotalus horridus*), which frequents the warmest regions of South America, and the Durissus (*C. durissus*), which has chosen the United States for its principal home. The chief enemy of this serpent is the hog, whom it dreads so much that on seeing one it immediately loses all its courage, and instantly takes to flight. But the hog, who smells it from afar, draws nearer and nearer, his bristles erected with excitement, seizes it by the neck, and devours it with great complacency, though without touching the head. As the hog is the invariable companion of the settler in the backwoods, the rattlesnake everywhere disappears before the advance of man, and it is to be hoped that a century or two hence it will be ranked among the extinct animals. The American Indians often regale on the rattlesnake. When they find it asleep, they put a small forked stick over its neck, which they keep immovably fixed to the ground, giving the snake a stick to bite, and this they pull back several times with great force, until they perceive that the poisonfangs are torn out. They then cut off the head, skin the body, and cook it as we do eels. The flesh is said to be white and excellent.

None of the American snakes inhabit the old world, but in the East Indies and Ceylon other no less dangerous species appear upon the scene, among which the celebrated Cobra de Capello is one of the most deadly.

As long as it is in a quiet mood, its neck is nowhere thicker than its head or other parts; but as soon as it is excited, it raises vertically the anterior part of its trunk, and dilating the hood on each side of the neck, which is curiously marked in the centre in black and white, like a pair of spectacles, advances against the aggressor by the undulating motion of the tail. It is not only met with in the cultivated grounds and plantations, but will creep into the houses and insinuate itself among the furniture. Bishop Heber heard at Patna of a lady who once lay a whole night with a cobra under her pillow. She repeatedly thought during the night that she felt something move, and in the morning when she snatched her pillow away, she saw the thick black throat, the square head, and the green diamond-like eyes of the reptile advanced within two inches of her neck. Fortunately the snake was without malice; but alas for her if she had during the night pressed him a little too roughly.

This is the snake so frequently exhibited by the Indian jugglers, who contrive by some unknown method to tame them so far as to perform certain movements in cadence, and to dance to the sound of music, with which the cobra seems much delighted, keeping time by a graceful motion of the head, erecting about half its length from the ground, and following the few simple notes of the conjuror's flute with gentle curves like the undulating lines of a swan's neck. It has been naturally supposed, before this could be done, that the poisonous fangs had been extracted; but Forbes, the author of 'Oriental Memoirs,' had nearly been taught at his cost that this is not always practised. Not doubting but that a cobra, which danced for an hour on the table while he painted it, had been disarmed of its fatal weapons, he frequently handled it to observe the beauty of the spots, and especially the spectacles on the hood. But the next morning his upper servant, who was a zealous Mussulman, came to him in great haste and desired he would instantly retire and praise the Almighty for his good fortune. Not understanding his meaning, Forbes told him that he had already performed his devotions, and had not so many stated prayers as the followers of his prophet. Mahomet then informed him that while purchasing some fruit in the bazaar, he observed the man who had been with him on the

preceding evening entertaining the country people with the dancing snakes ; they, according to their usual custom, sat on the ground around him, when, either from the music stopping too suddenly or from some other cause irritating the snake which he had so often handled, it darted at the throat of a young woman, and inflicted a wound of which she died in about half an hour. That the snake-charmers control the cobra not by extracting its fangs, but by courageously availing themselves of its timidity and reluctance to use them, was also proved during Sir E. Tennent's residence in Ceylon by the death of one of these performers, whom his audience had provoked to attempt some unaccustomed familiarity with the cobra ; it bit him on the wrist, and he expired the same evening.

The deserted nests of the termites are the favourite retreat of the sluggish and spiritless cobra, which watches from their apertures the toads and lizards on which it preys. On coming upon it, its only impulse is concealment ; and when it is unable to escape, a few blows from a whip are sufficient to deprive it of life.

It is a curious fact that, though not a water-snake, the cobra sometimes takes considerable excursions by sea. When the 'Wellington,' a Government vessel employed in the inspection of the Ceylonese pearl-banks, was anchored about a quarter of a mile from land, a cobra was seen, about an hour before sunset, swimming vigorously towards the ship. It came within twelve yards, when the sailors assailed it with billets of wood and other missiles, and forced it to return to land.

The Egyptian Haje (*Naja Haje*), a near relation of the Indian cobra, is probably the asp of ancient authors, which Queen Cleopatra chose as the instrument of her death, to avoid figuring in the triumph of Augustus. Like the cobra, it inflates its neck when in a state of excitement, and as it raises its head on being approached, as if watchful for its safety, it was venerated by the ancient Egyptians as a symbol of divinity, and as the faithful guardian of their fields. Divine honours have, however, much more frequently been paid to the venomous snakes from the terror they inspire, than from far-fetched notions of beneficence. Several Indian tribes in North America adore the rattlesnake ; and in the kingdom of Widah, on the coast of Guinea, a viper has its temple and ministers,

and is no less carefully provided for than if it were an inmate of the Zoological Gardens.

The Cerastes, or horned viper, one of the most deadly serpents of the African deserts, is frequently exhibited by Egyptian jugglers, who handle and irritate it with impunity: they are supposed to render themselves invulnerable by the chewing of a certain root, but most likely, as in the case of the cobra-charmers, their secret consists in their courage and perfect knowledge of the animal's nature.

Although the Boas and Pythons are unprovided with venomous fangs, yet, from their enormous size, they may well be ranked among the deadly snakes; for, as Waterton justly remarks, 'it comes nearly to the same thing in the end whether the victim dies by poison from the fangs, which corrupts his blood, or whether his body be crushed to mummy and swallowed by a Python.'

The kingly Jiboya (*Boa constrictor*) inhabits the dry and sultry localities of the Brazilian forests, where he generally conceals himself in crevices and hollows in parts but little frequented by man, and sometimes attains a length of thirty feet. To catch his prey he ascends the trees, and lurks, hidden in the foliage, for the unfortunate agutis, pacas, and capybaras, whom their unlucky star may lead within his reach. When full-grown he seizes the passing deer; but, in spite of his large size, he is but little feared by the natives, as a single blow of a cudgel suffices to kill him. Prince Maximilian of Neu Wied tells us that the experienced hunter laughs when asked whether the Jiboya attacks and devours man.

The Sucuriaba, Anaconda, or Water Boa (*Eunectes murinus*), as it is variously named, abounds in the swampy lowlands of tropical America, where it attains so enormous a size that, according to trustworthy witnesses,\* monsters more than sixty feet long are sometimes seen slowly crawling through the submerged groves of the Buriti palm. While lazily stretched out in the grass, it might easily be mistaken for the prostrate trunk of one of these noble trees. It passes most of its time, however, on the water, now reposing on a sand-bank with only its head above the surface of the stream, now rapidly swimming

\* Spix and Martius, 'Reisen in Brasilien.'

like an eel, or abandoning itself to the current of the river. Often, also, it suns itself on the sandy margin of the stream, or patiently awaits its prey, stretched out upon some rock or fallen tree. With sharp eye it observes all that swims in the waters, as well as all that flies over them, or all that comes to the banks to drink; neither fish nor aquatic bird is secure from its rapid assault, and woe to the capybara that comes within its grasp.

When preparing for an attack, it attaches itself with its tail to a tree or rock, and then suddenly darts its prodigious length upon its prey, the bones of which it breaks in its resistless folds before slowly swallowing it. A large snake will thus engulf a horse and its rider, or a whole ox as far as the horns, which eventually separate from the putrefying body. Even water-boas of a smaller size are able to swallow enormous masses; a deer and two pecaris were found in the stomach of one forty feet long. The chase of these hideous reptiles is not dangerous, for they are slow and cowardly, and a wound in the spine soon renders them stiff and unable to move. Their flesh is unfit to be eaten, but their fat is considered a remedy for consumption, and their tanned skin makes excellent coverings for saddles.

The boas principally inhabit America, although some species are likewise met with in Asia; but the still more formidable pythons are confined to the hot regions of the Old World. They are said to enlace even the tiger or the lion in their fatal embrace, and, to judge by their size and strength, this assertion seems by no means improbable.

The various serpent tribes are exposed to the attacks of many enemies, who fortunately keep their numbers within salutary bounds, and avenge the death of the countless insects, worms, toads, frogs, and lizards, that fall a prey to their strength or their venom. Several species of rapacious and aquatic birds live upon snakes, the American ostrich thins their ranks whenever he can, and the African Secretary is renowned for his prowess in serpentine warfare.



SECRETARY BIRD.

‘The battle was obstinate,’ says Le Vaillant, describing one

of these conflicts, 'and conducted with equal address on both sides. The serpent, feeling the inferiority of his strength, in his attempt to flee, and regain his hole, employed that cunning which is ascribed to him, while the bird, guessing his design, suddenly stopped him, and cut off his retreat by placing herself before him at a single leap. On whatever side the reptile endeavoured to make its escape, his enemy was still found before him. Then, uniting at once bravery and cunning, he erected himself boldly to intimidate the bird, and hissing dreadfully, displayed his menacing throat, inflamed eyes, and a head swelled with rage and venom. Sometimes this threatening appearance produced a momentary suspension of hostilities, but the bird soon returned to the charge, and covering her body with one of her wings as a buckler, struck her enemy with the horny protuberances upon the other, which, like little clubs, served the more effectually to knock him down as he raised himself to the blow; at last he staggered and fell, the conqueror then despatched him, and with one stroke of her bill laid open his skull.'

The secretary-eagle has now been successfully acclimatised in the West Indies, where he renders himself useful by the destruction of the venomous snakes with which the plantations are infested.

Gravely, 'with measured step and slow,' like a German philosopher cogitating over the nature of the absolute, but, as we shall presently see, much more profitably engaged, the adjutant wanders among the reeds on the banks of the muddy Ganges. The aspect of this colossal bird, measuring six feet in height and nearly fifteen from tip to tip of the wings, is far from being comely, as his enormous bill, his naked head and neck, except a few straggling curled hairs, his large craw hanging down the forepart of the neck like a pouch, and his long naked legs, are certainly no features of beauty. Suddenly he stops, dips his bill among the aquatic plants, and immediately raises it again triumphantly into the air, for a long snake, despairingly



ADJUTANT.

twisting and wriggling, strives vainly to escape from the formidable pincers which hold it *in carcere duro*. The bird throws back his head, and the reptile appears notably diminished in size; a few more gulps and it has entirely disappeared. And now the sedate bird continues his stately promenade with the self-satisfied mien of a merchant who has just made a successful speculation, and is engaged in the agreeable calculation of his gains. But, lo! again the monstrous bill descends, and the same scene is again repeated. The good services of the giant heron in clearing the land of noxious reptiles, and the havoc he is able to make among their ranks, may be judged of by the simple fact, that, on opening the body of one of them, a land-tortoise ten inches long and a large black cat were found entire within it, the former in the pouch, as a kind of stock in trade, the latter in the stomach, all ready for immediate consumption.

The Marabou Storks, though so intensely ugly, furnish in their superb white and downy plumes, which grow under their wings, a highly prized ornament of beauty. To procure these valuable feathers, of which each bird generally yields but four serviceable ones, they are bred in some villages in the neighbourhood of Calcutta, but may also be seen stalking about the streets of the 'City of Palaces,' where, on account of their scavenger utility, a heavy fine is imposed upon their destruction.

Brehin, who chased the Marabou on the banks of the White Nile, found him a most provoking game, always regulating his steps after those of his pursuer and keeping at a safe distance of two or three hundred paces. Such is his caution that he places sentinels to give notice of approaching danger, which is the more remarkable as he is one of the most voracious of birds.

Trusting to his agility and the certainty of his eye, the Indian ichneumon or Mongoos attacks without hesitation the most venomous serpents. The cobra, which drives even the leopard to flight, rises before the little creature with swelling hood and fury in its eye; but, swift as thought, the ichneumon, avoiding the death-stroke of the projecting fangs, leaps upon its back, and fastening his sharp teeth in the head, soon despatches the helpless reptile.

The serpents sometimes even feed upon their own brethren. Thus a rat-snake in the Zoological Gardens was once seen to

devour a common *Coluber Natrix*, but not having taken the measure of his victim, he could not dispose of the last four inches of his tail, which stuck out rather jauntily from the side of his mouth, with very much the look of a cigar. After a quarter of an hour the tail began to exhibit a retrograde motion, and the swallowed snake was disgorged, nothing the worse for his living sepulchre, with the exception of the wound made by his partner when first he seized him.

A python in the same collection, who had lived for years on friendly terms with a brother nearly as large as himself, was found one morning sole tenant of his den. As the cage was



MONGOOS.

secure, the keeper was puzzled to know how the serpent had escaped. At last it was observed that the remaining inmate had swollen remarkably during the night, when the truth came out.

When we consider that the snakes have neither legs, wings, nor fins, and are indeed deprived of all the usual means of locomotion, the rapidity of their progress is not a little surprising. On examining the anatomical structure of their body, however, it will be remarked that while we have only twelve pairs of ribs united in front by the breast-bone and cartilage, the snake has often more than three hundred, unconnected in front, and consequently much more free in their motions, a

faculty which is still further increased by the great mobility of the spondyli of the backbone. Between the ribs and the broad transverse scales or plates which exist on the belly of all such serpents as move rapidly, we find numerous muscles connecting them one with another, and thus, amply provided with a whole system of strong pulleys and points of attachment, the reptile, bringing up the tail towards the head, by bending the body into one or more curves, and then again resting upon the tail and extending the body, glides swiftly along, not only upon even ground, but even sometimes from branch to branch, as the smallest hold suffices for its stretching out its body at a foot's length into the air, and thus reaching another sallying point for further progress.

The anatomy of the serpent's jaws is no less remarkable than the mechanism of its movements. In spite of their proverbial wisdom, snakes would not be able to exist unless they were able to swallow large animal masses at a time. For, however rapid their motions may be, those of their prey are in general still more active, and thus they are obliged to wait in ambush till a fortunate chance provides them with a copious meal. The victim is often much more bulky than the serpent itself, but still, without tearing it to pieces, it is able to engulf it in its swelling maw. For the two halves of its lower jaw do not coalesce like ours into one solid mass, but are merely connected in front by a loose ligament, so that each part can be moved separately. The bones of the upper jaw and palate are also loosely attached or articulated one with the other, and thus the whole mouth is capable of great distension. By this mechanism, aided by the numerous sharp teeth, which are so many little hooks with the point curved backwards, each side of the jaws and mouth being able to act as it were independently of the other, alternately hooks itself fast to the morsel, or advances to fasten itself farther on in a similar manner, and thus the reptile draws itself over its prey, somewhat in the same way as we draw a stocking over our leg, after having first, by breaking the bones, fashioned it into a convenient mass, and rendered its passage more easy by lubricating it with its saliva. Slowly the huge lump disappears behind the jaws, descends lower and lower beneath the scales, which seem ready to burst asunder with distension, and then the satisfied monster coils

himself up once more to digest his meal in quiet. The time required for this purpose varies of course according to the size of the morsel ; but often weeks or even months will pass before a boa awakens from the lethargic repose in which—the image of disgusting gluttony—he lies plunged after a superabundant meal.

The reptiles in the Zoological Gardens are offered food once a week, but even then their appetites are frequently not yet awakened, though great care is taken never to spoil their stomachs by excess.

This is the time for visiting the Reptile House, which otherwise offers but little amusement, as the great snakes have either retired from public life under their blankets, or lie coiled upon the branches of the trees in their dens. Three o'clock is the feeding-time, and the reptiles, which are on the look-out, seem to know full well the errand of the man who enters with the basket, against the side of which they hear the fluttering wings of the feathered victims, and the short stamp of the doomed rabbits. The keeper opens the door at the back of the den of the huge pythons, for these he need not fear, takes off their blanket and drops a rabbit, who hops from side to side, curious to inspect his new habitation, and probably finding it to his taste, sits on his haunches and leisurely begins to wash his face. Silently the python glides over the stones, uncurling his huge folds, looks for an instant upon his unconscious victim, and the next has seized him with his jaws. His contracting folds are twisted as swiftly as a whiplash round his shrieking prey, and for ten minutes the serpent lies still, maintaining his mortal knot until his prey is dead, when seizing it by the ears, he draws it through his vice-like grip, crushing every bone, and elongating the body preparatory to devouring it.

The arrangement for feeding the venomous kinds, is, of course, more cautious. The door opens at the top instead of at the side of the dens, and with good reason ; for no sooner does the keeper remove with a crooked iron rod, the blanket from the cobra, than the reptile springs with inflated hood into an S-like attitude and darts laterally at his prey, whose sides have scarcely been pierced, when it is seized with tetanic spasms, and lies convulsed in a few seconds.

These instantaneous effects, almost as rapid as those of a mortal shot or of lightning itself, might at first sight seem to warrant the conclusion that the genius of evil had formed the venomous serpents to be his chosen agents of destruction; but at a nearer view, they afford but another proof of the beneficence of the Creator in providing weak, sober, and by no means cruel creatures, with a weapon which makes up to them for the want of speed, and at the same times abridges the torments of their victims.

Though generally the objects of abhorrence and fear, yet serpents sometimes render themselves useful or agreeable to man. Thus the rat-snake of Ceylon (*Coryphodon Blumenbachii*), in consideration of its services in destroying vermin, is often kept as a household pet, and so domesticated by the natives as to feed at their table.

The agility of this serpent in seizing its nimble-footed prey is truly wonderful. One day Sir Emerson Tennent had an opportunity of surprising a coryphodon which had just seized on a rat, and of covering it suddenly with a glass shade, before it had time to swallow its prey. The serpent, which appeared stunned with its own capture, allowed the rat to escape from its jaws, which cowered at one side of the glass in an agony of terror. On removing the shade, the rat, recovering its spirits, instantly bounded towards the nearest fence, but quick as lightning it was followed by its pursuer, which seized it before it could gain the hedge, through which the snake glided with its victim in its jaws.

The beautiful coral-snake (*Elaps corallinus*) is fondled by the Brazilian ladies, but the domestication of the dreaded cobras as protectors in the place of dogs, mentioned by Major Skinner, on undoubtedly good authority,\* is still more remarkable. They glide about the house, going in and out at pleasure, a terror to thieves, but never attempting to harm the inmates.

The Tree-snakes offer many beautiful examples of the adaptation of colour to the animal's pursuits; which we have already had occasion to admire in our brief review of the tropical insect world. They are frequently of an agreeable green or bluish

\* Sir E. Tennent's 'Ceylon,' vol. i. p. 193.

hue, so as hardly to be distinguishable from the foliage among which they seek their prey, or where they themselves are liable to be seized upon by their enemies. They are often able vertically to ascend the smoothest trunks and branches, in search of squirrels and lizards, or to rifle the nests of birds.

The Water-snakes which infest some parts of the tropical seas, though far from equalling in size the vast proportions of the fabulous sea-serpent, are very formidable from their venomous bite. They have the back part of the body and tail very much compressed and raised vertically, so as to serve them as a paddle with which they rapidly cleave the waters.



TOAD AND ANOLIS.

## CHAPTER XXIV.

### LIZARDS, FROGS AND TOADS.

Their Multitude within the Tropics—The Geckoes—Anatomy of their Feet—The Anolis—Their Love of Fight—The Chameleon—Its wonderful Changes of Colour—Its Habits—Peculiarities of its Organisation—The Iguana—The Teju—The Water-Lizards—Lizard Worship on the Coast of Africa—The Flying Dragon—The Basilisk—Frogs and Toads—The Pipa—The Bahia Toad—The Giant Toad—The Musical Toad—Brazilian and Surinam Tree-Frogs.

THE equatorial regions may well be called the head-quarters of the lizard race, as these reptiles nowhere else appear in such a multitude of genera, species, and individuals. The stranger is struck with their numbers as soon as he sets his foot on a tropical shore, for on all sides, on the sands and in the forests, on banks and rocks, on the trees and on the ground, innumerable varieties of lizards are seen basking, rustling, crawling, climbing, or rapidly darting along.

The *Geckoes* might even claim to be ranked among the domestic animals, as they take up their abode in the dwellings of man, where they make themselves useful by the destruction of flies, spiders, and other noxious or disagreeable insects, which they almost always swallow entire, their throat being as broad as

the opening of their jaws. During the day time they generally remain concealed in some dark crevice or chink, but towards evening they may be seen running along the steepest walls with marvellous rapidity, in keen pursuit of their prey, frequently standing still, nodding with their head, and uttering shrill tones, most likely by smacking their tongue against the palate. Their flattened flexible body seems to mould itself into the hollows, in which they often remain motionless for hours, and their generally dull colour harmonises so well with their resting-places, as to render them hardly distinguishable, a circumstance which answers the double purpose of masking their presence from the prey for which they lie in wait, and from the enemies that might be inclined to feast upon them. Among these, some of the smaller birds of prey—hawks and owls—are the most conspicuous, not to mention man, the arch-persecutor of almost every animal large enough to attract his notice.



GECKO.

How comes it that these nocturnal lizards, seemingly in defiance of the laws of gravitation, are thus able to adhere to ceilings or any other overhanging surfaces? An inspection of the soles of their broad feet will soon solve the enigma, for all their toes are considerably dilated on their margins, and divided beneath into a number of transverse lamellæ, parallel to each other, and generally without any longitudinal furrow. From these a fluid exudes which serves to attach the animal to the surface. They are also generally provided with sharp and crooked claws, retractile and movable, like those of a cat, and which render them good service in climbing trees.

In spite of their harmless nature, the Geckoes, their real utility being forgotten over imaginary grievances, nowhere enjoy a good reputation, probably in consequence of their ugliness, and the wild expression of their large eyes. They are accused of tainting with a virulent secretion every object they touch, and of provoking an eruption on the skin merely by running over it—a popular prejudice which naturally causes many a poor inoffensive Gecko's death. They abound all over the torrid zone, even in the remote islands of the Pacific, such

as Tahiti and Vanikoro. Duméril, enumerates fifty-five different species, only two of which are indigenous in Southern Europe, while India monopolises no less than thirteen for her share.

Mr. Adams once witnessed in Borneo a desperate struggle between a Gecko and a large Tarantula spider. After a long and doubtful contest, the Gecko proved at length victorious, and succeeded in swallowing the insect, whose enormous legs, protruding from the lizard's mouth, gave the animal the look some monstrous cuttle-fish.

The graceful *Anolis* are peculiar to America. By the structure of their feet, provided with long unequal toes, they are related to the Geckoes, but are distinguished from them by a more slender form of body, by their extremely long thin tail, and a large neck-pouch, which dilates under the influence of excitement. These small and nimble creatures, the largest species seldom exceeding eight inches in length, are as touchy as fighting-cocks. On approaching them, they instantly blow up their pouch, open widely their diminutive jaws, and spring upon the aggressor, striving to bite him with their teeth, which, however, are too tiny to do much harm. Among each other they live in a perpetual state of warfare. As soon as one *Anolis* sees another, he makes a rapid advance, while his adversary awaits him with all the courage of a gallant knight. Before beginning the conflict, they make all sorts of menacing gestures, convulsively nodding their heads and puffing up their pouches, until finally they close in desperate struggle.

‘The meeting of these champions proud  
Seems like the bursting thunder-cloud.’

If they are of equal strength, the battle remains for some time undecided. At length the vanquished *Anolis* turns and runs away, but he may think himself fortunate if he escapes with the loss of his tail. Many of them are thus deprived of this ornamental appendage, which they voluntarily leave behind to avoid a still greater disaster, and then they become timid, melancholy, and fond of retirement, as if ashamed of being seen, only regaining their spirits when, by a wonderful power of reproduction, the amputated tail has been replaced by another.

Like many other lizards, the *Anolis* possesses the faculty of

changing colour when under the influence of excitement, but of all animals, whether terrestrial or marine, none is more famous or remarkable in this respect than the *Chameleon*. It frequently happens that man, not satisfied with the wonders which Nature everywhere exposes to his view, adds to their marvels others of his own invention, and thus many a fable has been told about the Chameleon. It has been said, for instance, that it could emulate all the colours of the rainbow, but the more accurate observations of Hasselquist and other naturalists have shown that the whole change, which takes place most frequently when the Chameleon is exposed to full sunshine or under the influence of emotion, consists in its ordinary bluish-ash colour, turning to a green or yellowish hue with irregular spots of a dull red. Like many other reptiles, the Chameleon has the power of inflating its lungs and retaining the air for a long time so as one moment to appear as fat and well-fed as an alderman, and the next as lean and bony as a hungry disciple of the Muses. These alternating expansions and collapses seem to have a great influence on the change of colour, which, however, according to Milne-Edwards, is principally owing to the skin of the animal consisting of two differently coloured layers, placed one above the other, and changing their relative position under the influence of excitement.



CHAMELEON.

In our cold and northern regions the captive Chameleon cuts but a sorry figure: but in his own and sunny regions, which extend from southern Spain and Sicily to the Cape, and eastwards from Arabia and Hindostan to Australia, it is said to be by no means deficient in beauty, in spite of its strangely-formed carinated head, its enormously projecting eyes, and its granulated skin. Its manner of hunting for the little winged insects, that form its principal food, is very peculiar. Although the movements of its head are very limited, on account of the shortness of its neck, this deficiency is amply supplied by the wide range of its vision, each eye being able to move about in all directions independently of the other. Thus, while one of them attentively gazes upon the heavens,

the other minutely examines the ground, or while one of them rolls in its orbit, the other remains fixed; nay, their mobility is so great, that without even moving its stiff head, this wonderful lizard, like Janus, the double-faced god of ancient Rome, can see at the same time all that goes on before and behind it. When an insect comes flying along, the Chameleon, perched on a branch, and half concealed between the foliage, follows it in all its movements by means of his powerful telescopes, until the proper moment for action appears. Then, quick as thought, he darts forth, even to a distance of five or six inches, his long fleshy glutinous tongue, which is moreover furnished with a dilated and somewhat tubular tip, and drawing it back with the same lightning-like velocity, engulphs his prey. This independence of the eyes is owing to the imperfect sympathy which subsists between the two lobes of the brain and the two sets of nerves which ramify throughout the opposite sides of its frame. Hence also one side of the body may be asleep while the other is vigilant, one may be green while the other is ash-blue, and it is even said that the Chameleon is utterly unable to swim, because the muscles of both sides are incapable of acting in concert.

Destined for an arboreal life, he is provided with organs beautifully adapted for supporting himself on the flexible branches; for, besides the cylindrical tail nearly as long as his body which he coils round the boughs, his five toes are united two and three by a common skin, so as to form, as it were, a pair of pincers or a kind of hand, admirably suited for a hold-fast.

Among the *Iguanas*, a huge lizard tribe, characterised by a carinated back and tail, and a large denticulated gular pouch, the common or Great American Guana (*Iguana tuberculata*) deserves particular notice, as its white flesh is considered a great delicacy in Brazil and the West Indies. Notwithstanding its large size, for



IGUANA.

it not seldom attains a length of four or five feet, and the formidable appearance of its serrated back, it is in reality by no means of a warlike disposition, and so stupid that, instead of endeavouring to save itself by a

timely flight, it merely stares with its large eyes, and inflates its pouch, while the noose is passing round its neck to drag it from its hole.

The Bahama Islands abound with Guanas, which form a great part of the subsistence of the inhabitants. They are caught by dogs, trained for the purpose, in the hollow rocks and trees where they nestle, and either carried alive for sale to Carolina, or kept for home consumption. They feed wholly on vegetables and food, particularly on a kind of fungus, growing at the roots of trees, and on the fruits of the different kinds of pine apples, whence their flesh most likely acquires its delicate flavour.

The famous South American monitory lizard or Teju (*Tejus monitor*) is one of the largest and most beautiful of the whole race, as he measures no less than five feet from the snout to the tip of the tail, which is nearly twice as long as the body, while his black colour, variegated with bright yellow bands and spots, produces an agreeable and pleasing effect. The head is small, the snout gradually tapers, the limbs are slender, and the tail, which is laterally compressed, gradually decreases towards the extremity. The Teju lives in cavities and hollows, frequently under the roots of trees. When pursued, he runs rapidly straight forward to his burrow; but when his retreat is intercepted, he defends himself valiantly, and proves a by no means contemptible antagonist, as he is able to bite through a thick boot, and a stroke with his strong and muscular tail will completely disable a dog. Though the Monitor generally lives on land, he is an excellent swimmer, and catches many a fish in its native element. His chief food, however, consists in various fruits, rats, mice, birds, and he also devours a large number of the eggs and young of the alligator. The attachment to man which is universally attributed to him in Brazil, and the warning which, like his relation the Monitor of the Nile, he is said to give to him of the approach of the cayman or the crocodile, by emitting a peculiar and shrill sound, are idle fables which hardly required the contradiction of Prince Maximilian of Neu Wied, who in all his travels never once heard the Teju's



MONITOR.

monitory cry, although occasions were not wanting when it might have been of service.

The large Water-lizards (*Hydrosauri*) frequent the low river banks or the margins of springs, and although they may be seen basking on rocks or on the dead trunk of some prostrate tree in the heat of the sun, yet they appear more partial to the damp weeds and undergrowth in the neighbourhood of water. Their gait has somewhat more of the awkward lateral motion of the crocodile than of the lively action of the smaller saurians. When attacked, they lash violently with their tail, swaying it sideways with great force like the cayman. These modern types of the *Ichthyosaurus* have a graceful habit of extending the neck, and raising the head to look about them, and as you follow them leisurely over the rocks, or through the jungle, they frequently stop, turn their heads round, and take a deliberate survey of the intruder. They are by no means vicious, though they bite severely when provoked, acting, however, always on the defensive. On examining their stomachs, crabs, locusts, beetles, the remains of jumping fish, the scales of snakes, and bones of frogs and other small animals are discovered. Like that of the Iguanas, their flesh is delicate eating, resembling that of a very young sucking-pig. Mr. Adams gives us an amusing description of his contests with a gigantic Water-lizard (*Hydrosauria giganteus*): 'Throwing myself on him, I wounded him with a clasp knife in the tail, but he managed to elude my grasp, and made for the woods. I succeeded, however, in tracking his retreating form, on hands and knees, through a low covered labyrinth in the dense undergrowth, until I saw him extended on a log; when, leaving the jungle, I called my servant, a marine, who was shooting specimens for me, and pointing out the couchant animal, desired him to shoot him in the neck, as I did not wish the head to be injured, which he accordingly did. Entering the jungle, I then closed with the wounded saurian, and seizing him by the throat, bore him in triumph to our quarters. Here he soon recovered; and hoping to preserve him alive to study his habits, I placed him in a Malay wicker hen-coop. As we were sitting, however, at dinner, the black cook, with great alarm depicted in his features, reported that 'Alligator got out his cage!' Seizing the carving knife, I

rushed down, and was just in time to cut off his retreat into the adjoining swamp. Turning sharply round, he made a snap at my leg, and received in return a 'Rowland for his Oliver' in the shape of an inch or so of cold steel. After wrestling on the ground, and struggling through the deserted fire of our sable cook, I at length secured the runaway, tied him up to a post, and to prevent further mischief, ended his career by dividing the jugular. The length of this lizard from actual measurement was five feet ten inches and a half.

These semi-aquatic, dingy-hued saurians are admirably adapted to the hot moist swamps and shallow lagoons that fringe the rivers of the tropical alluvial plains. As we watch their dark forms, plunging and wallowing in the water, or sluggishly moving over the soft and slimy mud, the imagination is carried back to the age of reptiles, when the muddy shores of the primæval ocean swarmed with their uncouth forms. The huge lizard, six or seven feet long, to which divine honours are paid at Bonny on the coast of Guinea, belongs most likely to this amphibious class. Undisturbed, the lazy monsters crawl heavily through the streets, and as they pass, the negroes reverentially make way. A white man is hardly allowed to look at them, and hurried as fast as possible out of their presence. An attempt was once made to kidnap one of these dull lizard-gods for the benefit of a profane museum, but the consequences were such as to prevent a repetition of the offence, for all trade and intercourse with the ships in harbour was immediately stopped, and affairs assumed so hostile an aspect, that the foreigners were but too glad to purchase peace with a considerable sacrifice of money and goods. When one of these lizards crawls into a house, it is considered a great piece of good fortune; and when it chooses to take a bath, the Bonnians hurry after it in their canoes. After having allowed it to swim a stretch, and to plunge several times, they seize it for fear of danger, and carry it back again to the land, well pleased at once more having the sacred reptile in their safe possession.

The formidable name of Flying Dragons has been given to a genus of small lizards, remarkable for the expansible cutaneous processes with which the sides are furnished, and by whose means they are enabled to spring with more facility from branch to branch, and even to support themselves for some

time in the air, like the bat or flying-squirrel. The tiny painted Dragon of the East, the Flying Lizard of the woods,



FLYING DRAGON.

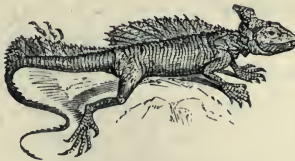
is fond of clinging with its wings to the smooth trunks of trees, and there remaining immovable, basking in the sun. When disturbed, it leaps and shuffles away in an awkward manner. One Mr. Adams had in his possession, reminded him of a bat when placed on the ground. Sometimes the strange creature would feign death, and remain perfectly motionless, drooping its head, and doubling its limbs, until

it fancied the danger over, then cautiously raising its crouching form, it would look stealthily around, and be off in a moment. The dragon consumes flies in a slow and deliberate manner, swallowing them gradually; its various species belong exclusively to India and the islands of the Eastern Archipelago.

Who has not heard of the fatal glance of the *basilisk*, which, according to poetical fancy, obliged all other poisonous animals to keep at a respectful distance

‘from monster more abhorr’d than they’?

The truth is, that the ugly lizards that bear this dreaded name, which has been given them from the fanciful resemblance of their pointed occipital crest to a regal crown, are quite as harmless and inoffensive as the flying dragon. They are chiefly inhabitants of South America, where they generally lead a sylvian life, feeding on insects.



BASILISK.



SURINAM TOAD.

Among the toads of the torrid zone there is none more curious than the large and hideous *Pipa Surinamensis*, whose

deformity is often aggravated by a phenomenon unexampled in the rest of the animal world, namely, the young in various stages of exclusion, proceeding from cells dispersed over the back of the parent. It was for a long time supposed that the ova of this extraordinary reptile were produced in the dorsal cells without having been first excluded in the form of spawn; but it is now thoroughly ascertained that the female *Pipa* deposits her eggs or spawn at the brink of some stagnant water, and that the male collects or amasses the heap of ova, and deposits them with great care on the back of the female, where, after impregnation, they are pressed into the cellules, which are at that period open for their reception, and afterwards close over them; thus retaining them till the period of their second birth, which happens in somewhat less than three months, when they emerge from the back of the parent in their complete state. The *Pipa* is fond of dark nooks and corners, and avoids the light of day as if conscious of its unrivalled hideousness.

Mr. Darwin thus describes a remarkable species of toad he noticed at *Bahia*. 'Amongst the Batrachian reptiles, I found only one little toad, which was most singular from its colour. If we imagine, first, that it had been steeped in the blackest ink, and then, when dry, allowed to crawl over a board freshly painted with the brightest vermilion, so as to colour the sides of its feet and parts of its stomach, a good idea of its appearance will be gained. If it is an unnamed species, surely it ought to be called *diabolicus*, for it is a fit toad to preach in the ear of Eve. Instead of being nocturnal in its habits as other toads are, and living in damp and obscure recesses, it crawls during the heat of the day about the dry sand hillocks and arid plains, where not a single drop of water can be found. It must necessarily depend on the dew for its moisture, and this probably is absorbed by the skin, for it is known that these reptiles possess great powers of cutaneous absorption. At Maldonado I found one in a situation nearly as dry as at Bahia Blanca, and, thinking to give it a great treat, carried it to a pool of water; not only was the little animal unable to swim, but I think without help would soon have been drowned.'



BAHIA TOAD.

The giant-toad (*Bufo gigas, aqua*) frequents the Brazilian campos in such numbers that in the evening or after a shower of rain, when they come forth from their hiding-places to regale on the damp and murky atmosphere, the earth seems literally to swarm with them. They are double the size of our common toad, and are even said to attain, with their outstretched hind legs, a foot's length, with a proportionate girth. Covered with unsightly warts, and of a dull grey colour, their aspect is repulsive, and when excited, they eject a liquid which is very much feared by the natives. Their voice is loud and disagreeable; while Guinea possesses, in the *Breviceps gibbosus*, a small toad which is said to sing delightfully, 'charming the swamps with its melodious note.'

A Brazilian tree-frog, (*Hyla crepitans*) which adheres to the large leaves, not merely with its widened toes, but with its constantly viscid body, has a voice which sounds like the cracking of a large piece of wood, and generally proceeds from many throats at a time. On wandering through the forests of Brazil, Prince Maximilian of Neu Wied was often surprised by this singular concert issuing from the dark shades of the forest.

A Surinam tree-frog (*Hyla micans*) has the singular property of secreting a luminous slime, so as to look in the dark like a yellowish will-o'-the-wisp. Its voice is most disagreeable, and is said at times completely to overpower the orchestra of the theatre in Paramaribo, thus emulating the stentorian achievements of the Virginian bull-frog.

## CHAPTER XXV.

## TORTOISES AND TURTLES.

The Galapagos—The Elephantine Tortoise—The Marsh-Tortoises—Mantega—River-Tortoises—Marine-Turtles—On the Brazilian Coast—Their Numerous Enemies—The Island of Ascension—Turtle-Catching at the Bahama and Keeling Islands—Turtle caught by means of the Sucking-Fish—The Green Turtle—The Hawksbill Turtle—Turtle Scaling in the Feejee Islands—Barbarous mode of selling Turtle-flesh in Ceylon—The Coriaceous Turtle—Its awful Shrieks.

**I**N the South Sea, exposed to the vertical beams of the equatorial sun, lies a large group of uninhabited islands, on whose sterile shores you would look in vain for the palms, bananas, or bread-fruit trees of more favoured lands, as rain falls only upon the heights, and never descends to call forth plenty on the arid coasts.

And yet, this desolate group offers many points of interest to the naturalist, for the Galapagos or Tortoise Islands represent, as it were, a little world in themselves, a peculiar creation of animals and plants, reminding us, more strongly than the productions of any other land, of an earlier epoch of planetary life. Here are no less than twenty-six different species of land-birds, which, with one single exception, are found nowhere else. Their plumage is homely, like the flora of their native country; their tameness so great that they may be killed with a stick. A sea-mew, likewise peculiar to this group, mixes its shriek with the hoarse-resounding surge; lizards, existing in no other country, swarm about the shore, and the gigantic land-tortoise (*Testudo indica, elephantina*), although now spread over many other countries, is supposed by Mr. Darwin to have had its original



AMBLYRHINE.

seat in the Galapagos, where it was formerly found in such vast numbers as to have given the group its Spanish name. If the seafarer visits these treeless shores, which as yet produce nothing else worth gathering, it is chiefly for the purpose of catching a few of these huge animals, which, in spite of frequent persecutions, still amply reward a short sojourn with a rich supply of fresh meat. Their capture costs nothing but the trouble, for man has not yet drawn the boundary marks of property over the tenantless land.

The elephantine tortoise inhabits as well the low and sterile country, where it feeds on the fleshy leaves of the cactus, as the mountainous regions where the moist trade-wind calls forth a richer vegetation of ferns, grasses, and various trees. On this meagre food, which seems hardly sufficient for a goat, it thrives so well that three men are often scarcely able to lift it, and it not seldom furnishes more than 200 pounds of excellent meat.

‘The tortoise,’ says Mr. Darwin, ‘is very fond of water, drinking large quantities, and wallowing in the mud. The larger islands alone possess springs, and these are always situated towards the central parts, and at a considerable elevation. The tortoises, therefore, which frequent the lower districts, when thirsty, are obliged to travel from a long distance. Their broad and well-beaten paths radiate off in every direction, from the wells even down to the sea coast, and the Spaniards, by following them up, first discovered the watering places. When I landed at Chatham Island, I could not imagine what animal travelled so methodically along the well-chosen tracks. Near the springs it was a curious spectacle to behold many of these great monsters, one set eagerly travelling onward with outstretched necks, and another set returning after having drank their fill. When the tortoise arrives at the spring, quite regardless of any spectator, it buries its head in the water above the eyes, and greedily swallows great mouthfuls, at the rate of about ten in a minute. The inhabitants\* say each animal stays three or four days in the neighbourhood of the water, and then returns to the lower country; but they differed in their accounts respecting the fre-

\* At the time of Mr. Darwin's visit an attempt, since given up, had been made to colonise the islands, which are once more only tenanted by casual adventurers, and may be well called *uninhabited*.

quency of these visits. The animal probably regulates them according to the nature of the food which it has consumed. It is, however, certain that tortoises can subsist even on those islands where there is no other water than what falls during a few rainy days in the year. I believe it is well ascertained that the bladder of the frog acts as a reservoir for the moisture necessary to its existence—such seems to be the case with the tortoise. For some time after a visit to the springs, the urinary bladder of these animals is distended with fluid, which is said gradually to decrease in volume, and to become less pure. The inhabitants, when walking in the lower districts and overcome with thirst, often take advantage of this circumstance by killing a tortoise, and if the bladder is full, drinking its contents. In one I saw killed, the fluid was quite limpid, and had only a very slightly bitter taste.

‘The tortoises, when moving towards any definite point, travel by night and day, and arrive at their journey’s end much sooner than would be expected. The inhabitants, from observations on marked individuals, consider that they can move a distance of about eight miles in two or three days. One large tortoise, which I watched, I found walked at the rate of sixty yards in ten minutes, that is, three hundred and sixty in the hour, or four miles a day, allowing also a little time for it to eat on the road. The flesh of this animal is largely employed, both fresh and salted, and a beautifully clear oil is prepared from the fat.

‘When a tortoise is caught, the man makes a slit in the skin near its tail, so as to see inside its body, whether the fat under the dorsal plate is thick. If it is not, the animal is liberated, and it is said to recover soon from this strange operation. In order to secure the tortoises, it is not sufficient to turn them like turtle (their upper buckler being highly arched, while it is more flattened in the aquatic families, for the better adaptation of their forms to motion in a liquid), for they are often able to regain their upright position.’

They are said to be completely deaf; so much is certain, that they do not perceive a person even when walking close behind them. Mr. Darwin often amused himself by overtaking the slow and monstrous creatures, who, as soon as he had passed them, instantly withdrew their head and legs, and fell flat

down with a loud hiss and heavy noise as if touched by lightning. He then mounted upon their back, and on giving them a smart slap or two on the hind part of their carapace, they rose and leisurely proceeded with their learned freight, the author of 'Origin of Species' finding it very difficult to maintain his equilibrium on this strange beast of burthen.

It is a remarkable fact, that though the land-tortoises are scattered in many places over the warmer regions of the globe, and even extend as far as Patagonia and the south of Europe, yet not a single one has hitherto been found in Australia, where, equally strange to say, no indigenous monkey exists.

The marsh tortoises, or *Emydae*, have their chief seat in tropical America and the Indian Archipelago, where an abundance of swamps, lagoons, lakes, pools, and gently-flowing rivers favours the increase of their numbers. In the month of September, as soon as the



MARSH TORTOISE.  
(*EMYS PICTA.*)

sand-banks begin to be uncovered, the females deposit their eggs, scraping hollows of a considerable depth, covering them over carefully, smoothing and beating down the sand, and then walking across and across the place in various directions, for the purpose of concealment. There are such numbers of them, that some beaches are almost one mass of eggs beneath the surface, and here the Indians come to make oil. A canoe is filled with the eggs, which are all broken and mashed up together. The oil rises to the top, and is skimmed off and boiled, when it will keep, and is used both for light and for cooking. During this operation, the neighbouring strand swarms with carrion vultures, and the smell of the offal attracts also a number of alligators, eager to come in for their share of the feast. Millions of eggs are thus annually destroyed, and of those that remain a very small portion only arrives at maturity. When the young tortoises issue from the egg and run to the water, many enemies are awaiting them. Great alligators open their jaws, and swallow them by hundreds; the jaguars and the smaller felidæ from the forest come to feed upon them; eagles and buzzards and the great wood ibises attend the feast, and when they have escaped all these, there are many ravenous fishes which seize them in the stream.

The marsh-tortoises may be said to form the connecting link between the eminently aquatic marine and river chelonians and the land-tortoises, as the formation of their feet, armed with sharp claws or crooked nails, and furnished with a kind of flexible web, connecting their distinct and movable toes, allows them both to advance much quicker on the dry land than the latter, and to swim rapidly either on the surface or in the depth of the waters.

Endowed with more rapid powers of locomotion, they are not vegetarians, like the land-tortoises, but chiefly live on mollusks, fishes, frogs, toads, and annelides.

The river-tortoises differ in many respects from the sea-turtles, although formed like them for a purely aquatic life. In both families the extremities are complete fins, serving as oars, but the fore feet of the river-tortoises are not double the length of the hind feet, as we find in the marine chelonians; and while the latter have a short apoplectic neck, that of the river-tortoise is generally very long, and surmounted by a small and narrow head. The river-tortoises are exclusively confined to the warmer countries of the globe, and sometimes weigh as much as seventy pounds. It seems that during the night, and when they fancy themselves secure from danger, they repose upon the small river islands, or on rocks and trunks of trees that have fallen on the banks, or are drifted along by the current, and instantly plunge again into the water at the sight of man or at the least alarming noise. They are extremely voracious, and being very active swimmers, kill numbers of fish and reptiles. When they wish to seize their food or to defend themselves, they dart forwards their head and long neck with the velocity of lightning, and are said in this manner to surprise and seize even small birds that incautiously fly too near the surface of the water. They bite lustily with their sharp beak, never quitting their hold till they have fairly scooped out the morsel, so that the fishermen stand in great awe of their powerful mandibles, and generally cut off their head as soon as they are caught, rightly judging this to be the most radical means to prevent any further mischief. The Indians of the Amazons catch them either with the hook, net, or arrow. The last is the most ingenious method, and requires the most skill. The tortoise never shows its back above water,

only rising to breathe, which it does by protruding its nostrils almost imperceptibly above the surface. The Indian's keen eye perceives this, even at a considerable distance, but an arrow shot obliquely would glance off the smooth flat shell, so he shoots up into the air with such accurate judgment that the arrow falls nearly vertically upon the shell, which it penetrates, and remains securely fixed in the tortoise's back. The head of the arrow fits loosely on to the shaft, and is connected with it by a long fine cord, carefully wound round it; as the tortoise dives they separate, the light shaft forming a float or buoy which the Indian secures, and by the attached cord draws the prize up into his canoe. In this manner almost all the tortoises sold in the small settlements on the Amazons are procured, and the little square vertical hole of the arrow-head may generally be seen in the shell.

The turtles, which are likewise inhabitants of the warmer latitudes, though sometimes a strange erratic propensity or mischance will carry them as far from their usual haunts as the North Sea, have, as we all know, a far greater commercial and gastronomic value than all the rest of the tortoise tribes.\*

During the Brazilian summer (December, January, February), colossal turtles are seen everywhere swimming about along the coast, raising their thick round heads above the water, and waiting for the approach of night to land. The neighbouring Indians are their bitterest enemies, killing them whenever they can. Thus these dreary sand coasts, bounded on one side by the ocean and on the other by gloomy primæval forests, offer on all sides pictures of destruction, for the bones and shells of slaughtered turtles everywhere bestrew the ground. Two parallel grooves indicate the path of the turtle after landing; they are the marks of the four large and long fin-shaped feet or paddles, and between them may be seen a broad furrow where the heavy body trailed along the ground. On following these traces about thirty or forty yards shore-upwards, the huge animal may be found sitting in a flat excavation formed by its circular movements, and in which one half of its body is imbedded. It allows itself to be handled on all sides without

\* For more ample details on the Marine Chelonians, see chap. ix. of 'The Sea and its Living Wonders.'

making the least attempt to move away, being probably taught by instinct how useless all endeavours to escape would be. A blowing or snorting like that of a goose when any one approaches its nest, at the same time inflating its neck a little, are the sole signs of defence which it exhibits.

On the small islands of Talong, on the coast of Borneo, Mr. Brooke had an opportunity of seeing a turtle deposit its eggs: When on the sand it wandered from place to place, and tried several by digging a little, apparently rejecting them as unfit. At length, having made its choice, it buried its nose, and began scooping the sand with its hinder feet in a most deliberate and easy manner, throwing the sand to a considerable distance. It often stopped in its work and recommenced, and so dug till the body was pretty well buried, and the hole a depth of three or more feet. It then took its station over the hole and began to lay its eggs, which it did at intervals for a length of time, to the number of two hundred and thirty, and all the while was perfectly indifferent to the proximity of numerous spectators. Having deposited the eggs, it filled the hole with its hinder fins, and beat down the sand both on the spot and all around, and then retired, not *directly* (for the track would have been a guide to the nest), but in numerous tortuous courses, round and round, and finally took its departure for the sea at a point distant from its eggs. The Malays on watch have small sticks with flags on them, and as each turtle deposits its eggs they mark the spot with one of these, and the following morning take the eggs. With all their vigilance, however, numbers escape their observation, and some nests they purposely spare.

Similar scenes take place during the dry season throughout the whole of the tropical zone, on every sandy, unfrequented coast: for the same instinct which prompts the salmon to swim stream-upwards, the cod to seek elevated submarine banks, or the penguin to leave the high seas and settle for the summer on some dreary rock, attracts also the turtles from distances of fifty or sixty leagues to the shores of desert islands or solitary bays.

The enemies of the marine chelonians are no less numerous than those of the terrestrial or fluviatile species. While the full-grown turtles, as soon as they leave the water, are exposed

to the attacks of many ravenous beasts, from the wild dog to the tiger or jaguar; storks, herons, and other strand- or sea-birds devour thousands upon thousands of the young before they reach the ocean, where sharks and other greedy fishes still further thin their ranks, so that but very few escape from the general massacre, and the whole race can only maintain itself by its great fecundity.

Of all the foes of the turtle-tribe there is, however, none more formidable than man, as even on the most lonely islands the seafarer lies in wait for them, eager to relieve the monotony of his coarse fare by an abundant supply of their luscious flesh.

On the isle of Ascension, the head-quarters of the finest turtle in the world, all the movements of the poor creatures are carefully watched, and when, after having deposited their eggs in the sand, they waddle again towards the sea, their retreat is often intercepted, for two stout hands running up to the unfortunate turtle after the completion of her task, one seizes a fore-flipper and dexterously shoves it under her belly to serve as a purchase; whilst the other, avoiding a stroke which might lame him, cants her over on her back, where she lies helpless. From fifteen to thirty are thus turned in a night. In the bays, when the surf or heavy rollers prevent the boats being beached to take on board the turtles when caught, they are hauled out to them by ropes.

In former times, as long as the island had neither master nor inhabitants, every ship's crew that landed helped itself to as many turtles as it could catch; but since England has taken possession of the island, turtle-turning has been converted into a Government monopoly. They are kept in two large enclosures near the sea, which flows in and out, through a break-water of large stones. A gallows is erected between the two ponds, where the turtles are slaughtered for shipping, by suspending them by the hind-flippers and then cutting their throats. Often above 300 turtles, of 400 lbs. and 500 lbs. each, are lying on the sand or swimming about in the ponds—a fine sight for an alderman.

The way by which the turtles are most commonly taken at the Bahama Islands is by striking them with a small iron peg of two inches long, put in a socket at the end of a staff of twelve feet long. Two men usually set out for this work in a canoe,

one to row and gently steer the boat, while the other stands at the end of it with his weapon. The turtles are sometimes discovered by their swimming with their head and back out of the water, but they are more often seen lying at the bottom a fathom or more deep. If a turtle perceives he is discovered, he starts up to make his escape; the men in the boat, pursuing him, endeavour to keep sight of him, which they often lose and recover again by the turtle putting his nose out of the water to breathe.

On Keeling Island, Mr. Darwin witnessed another highly interesting method of catching turtle.

‘I accompanied Captain Fitzroy to an island at the head of the lagoon,’ says the eminent naturalist; ‘the channel was exceedingly intricate, winding through fields of delicately-branched corals. We saw several turtles, and two boats were then employed in catching them. The method is rather curious: the water is so clear and shallow that, although at first a turtle quickly dives out of sight, yet in a canoe, or boat under sail, the pursuers, after no very long chase, come up to it. A man, standing ready in the bows, at this moment dashes through the water upon the turtle’s back; then clinging with both hands by the shell of the neck, he is carried away till the animal becomes exhausted and is secured. It was quite an interesting chase to see the two boats thus doubling about, and the men dashing into the water trying to seize their prey.’

The Green turtle (*Chelonia midas*), which has been known to attain a length of seven feet, and a weight of 900 lbs., is most prized for its flesh; but the Hawksbill (*Chelonia imbricata*), which hardly reaches one-third of the size, is of far greater commercial value, the plates of its shell being stronger, thicker, and clearer than those of any other species. It is caught all over the tropical seas, but principally near the Moluccas, the West Indian, and the Feejee Islands, where it is preserved in pens by the chiefs, who have a barbarous way of removing the valuable part of the shell from the living animal. A burning brand is held close to the outer shell, until it curls up and separates a little from that beneath. Into the gap thus formed a small wooden wedge is then inserted, by which the whole is



GREEN TURTLE.

easily removed from the back. When stripped, the animal is again put into the pen, where it has full time for the growth of a new shell—for though the operation appears to give great pain, it is not fatal.

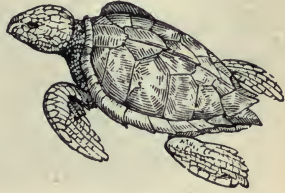
A similar cruel method of removing the tortoise's shell by heat is resorted to in Ceylon; but the mode in which the flesh of the edible turtle is sold piecemeal, while it is still alive, by the fishermen of that island, is still more repulsive, and a disgrace to the Colonial Government which allows it to be openly practised. 'The creatures,' says Sir Emerson Tennent, 'are to be seen in the market-place undergoing this frightful mutilation, the plastron and its integuments having been previously removed, and the animal thrown on its back, so as to display all the motions of the heart, viscera, and lungs. A broad knife, from twelve to eighteen inches in length, is first inserted at the left side, and the women, who are generally the operators, introduce one hand to scoop out the blood, which oozes slowly. The blade is next passed round till the lower shell is detached and placed to one side, and the internal organs exposed in full action. Each customer, as he applies, is served with any part selected, which is cut off as ordered, and sold by weight. Each of the fins is thus successively removed, with portions of the fat and flesh, the turtle showing by its contortions that each act of severance is productive of agony. In this state it lies for hours writhing in the sun, the heart and head being usually the last pieces selected; and till the latter is cut off, the snapping of the mouth, and the opening and closing of the eyes, show that life is still inherent, even when the shell has been nearly divested of its contents.'

The Coriaceous turtle (*Sphargis coriacea*), of a more elongated form than the other species, and whose outer covering, marked along its whole length by seven distinct, prominent, and tuberculated ridges, is not of a horny substance, but resembles strong leather, grows to the greatest size of all the marine chelonians, some having been taken above eight feet in length, and weighing no less than 1,600 lbs., so that even the crocodile can hardly be compared to it in bulk.

While the land-tortoises can scarcely be said to have a voice, merely hissing or blowing when irritated or seized, the Coriaceous turtle, when taken in a net or seriously wounded,

utters loud shrieks, or cries, that may be heard at a considerable distance—a power which, in an inferior degree, seems to belong to most of the fluviatile and marine chelonians.

The turtles generally live on marine plants, but the Caouana, or Loggerhead (*Chelonia caouana*), and the Hawksbill (*C. imbricata*), feed on crustaceans and cuttle-fish, which they can easily crush in their strong, horny beak. The Caouana and the Coriaceous turtles are frequently found in the Mediterranean, and on the coasts of South America and Africa. Both are of no commercial importance; their shell is almost useless, and their flesh, which, like that of the alligator, exhales a strong smell of musk, is extremely coarse and ill flavoured.



LOGGERHEAD.



CROCODILES AND ALLIGATORS.

## CHAPTER XXVI.

### CROCODILES AND ALLIGATORS.

Their Habits—The Gavial and the Tiger—Mode of Seizing their Prey—Their Voice—Their Preference of Human Flesh—Alligator against Alligator—Wonderful Tenacity of Life—Tenderness of the Female Cayman for her Young—The Crocodile of the Nile—Its Longevity—Enemies of the Crocodile—Torpidity of Crocodiles during the Dry Season—Their Awakening from their Lethargy with the First Rains—‘Tickling a Crocodile.’

**T**HERE was a time, long before man appeared upon the scene, when huge Crocodiles swarmed in the rivers of England, and, for aught we know, basked on the very spot where now their grim representatives can hardly be said to adorn the grounds of Sydenham Palace.

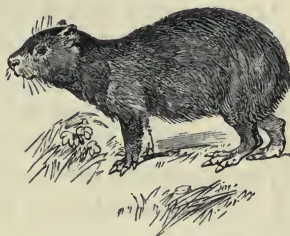
But the day when the ferocious, bone-harnessed Saurians lorded it in the European streams has passed, never to return ; the diminished warmth of what are now the temperate regions of the globe having long since confined them to the large rivers and lagunes of the torrid zone. The scourge and terror of all that lives in the waters which they frequent, they may with full justice be called the very images of depravity, as perhaps no animals in existence bear in their countenance more decided marks of cruelty and malice. The depressed head, so significant of a low cerebral development ; the vast maw, garnished with formidable rows of conical teeth, entirely made for snatch and swallow ; the elongated mud-coloured body, with

its long lizard-like tail, resting on short legs, stamp them with a peculiar frightfulness, and proclaim the baseness of their instincts.

The short-snouted, broad-headed Alligators, or Caymen, belong to the New World; the Gavials, distinguished by their straight, long, and narrow jaw, are exclusively Indian; while the oblong-headed Crocodiles are not only found in Africa and Asia, but likewise infest the swamps and rivers of America. All these animals, however, though different in form and name, have everywhere similar habits and manners; so that, in general, what is remarked of the one may be applied to the others.



ALLIGATOR.



CAPYBARA.

Formed for an aquatic life they are very active in the water, darting along with great rapidity by means of their strong muscular tail and their webbed hind feet. They sometimes bask in the sunbeams on the banks of the rivers, but oftener float on the surface, where, concealing their head and feet, they appear like the rough trunk of a tree, both in shape and colour, and thus are enabled the more easily to deceive and catch their prey.

In America, many a slow-paced Capybara, or water-pig, coming in the dusk of evening to slake its thirst in the lagune, has been suddenly seized by an insidious Alligator; and the Gangetic Gavial is said to make even the tiger his prey. When the latter quits the thick cover of the jungle to drink at the stream, the Gavial, concealed under water, steals along the bank, and, suddenly emerging, furiously attacks the tiger, who never declines the combat; and though in the struggle the Gavial frequently loses his eyes and receives dreadful wounds on the head, he at length drags his adversary into the water, and there devours him.\*

\* Forbes' 'Oriental Memories,' vol. i. p. 357.

In order to observe the manner in which the Alligator seizes its prey, Richard Schomburgk frequently tied a bird or some large fish to a piece of wood, and then turned it adrift upon the stream. Scarcely had the Cayman perceived his victim than he slowly and cautiously approached, without even rippling the surface of the water, and then curving his back, hurled his prey, by a stroke of his tail, into his wide-extended jaws.

On the American streams, the stillness of the night is often interrupted by the clacking of the Cayman's teeth, and the lashing of his tail upon the waters. The singular and awful sound of his voice can also readily be distinguished from that of all the other beasts of the wilderness. It is like a suppressed sigh, bursting forth all of a sudden, and so loud as to be heard above a mile off. First, one emits this horrible noise; then another answers him; and far and wide the repetition of the sound proclaims that the Caymen are awake. When these hideous creatures have once tasted the flesh of man, they are said, like the cannibals of the Feejee Islands, to prefer it to that of any animal.

During Humboldt's stay at Angostura, a monstrous Cayman seized an Indian by the leg while he was busy pushing his boat ashore in a shallow lagoon, and immediately dragged him down into the deeper water. The cries of the unfortunate victim soon attracted a large number of spectators, who witnessed the astonishing courage with which he searched in his pocket for a knife. Not finding a weapon, he then seized the reptile by the head, and pressed his fingers into its eyes—a method which saved Mungo Park's negro from a similar fate. In this case, however, the monster did not let go his hold, but disappearing under the surface with the Indian, came up again with him as soon as he was drowned, and dragged the body to a neighbouring island.

'One Sunday evening,' says Waterton, 'some years ago, as I was walking with Don Felipe de Yriarte, Governor of Angostura, on the bank of the Orinoco—"Stop here a minute or two, Don Carlos," said he to me, "while I recount a sad accident. One fine evening, last year, as the people of Angostura were sauntering up and down in the Alameda, I was within twenty yards of this place, when I saw a large Cayman rush out of the river, seize a man, and carry him down, before anybody had it

in his power to assist him. The screams of the poor fellow were terrible, as the Cayman was running off with him. He plunged into the river with his prey; we instantly lost sight of him, and never saw or heard him more.”

Humboldt also relates that, during the inundations of the Orinoco, alligators will sometimes make their appearance in the very streets of Angostura, where they have been known to attack and drag away a human prey.

Even among each other, these ferocious animals frequently engage in deadly conflict. Thus, Richard Schomburgk once saw a prodigiously large Cayman seize one of a smaller species (*Champsia vallifrons*) by the middle of the body, so that the head and tail projected on both sides of its muzzle. Now both of them disappeared under the surface, so that only the agitated waters of the otherwise calm river announced the death-struggle going on beneath; and then again the monsters reappeared, wildly beating the surface; so that it was hardly possible to distinguish here a tail, or there a monstrous head, in the seething whirlpool. At length, however, the tumult subsided, and the large Cayman was seen leisurely swimming to a sand-bank, where he immediately began to feed upon his prey.

The same traveller relates an interesting example of the Cayman's tenacity of life. One of them having been wounded with a strong harpoon, was dragged upon a sand-bank. Here the rays of the sun seemed to infuse new life into the monster, for, awakening from his death-like torpidity, he suddenly snapped about him with such rage that Schomburgk and his assistants thought it prudent to retreat to a safer distance. Seizing a long and mighty pole, the bravest of the Indians now went towards the Cayman, who awaited the attack with wide-extended jaws, and plunged the stake deep into his maw—a morsel which the brute did not seem to relish. Meanwhile two other Indians approached him from behind, and kept striking him with thick clubs upon the extremity of the tail. At every blow upon this sensitive part, the monster bounded in the air and extended his frightful jaws, which were each time immediately regaled with a fresh thrust of the pole. After a long and furious battle, the Cayman, who measured twelve feet in length, was at last slain. Another remarkable instance of the vitality of the common crocodile is mentioned

by Sir E. Tennent. A gentleman at Galle having caught on a baited hook an unusually large one, it was disembowelled by his coolies, the aperture in the stomach being left expanded by a stick placed across it. On returning, in the afternoon, with a view to secure the head, they found that the creature had crawled for some distance, and made its escape into the water.

We all know the intense hatred which sailors bear to the shark, and with what savage delight they drag one on board, and hack him to pieces with their knives before life is extinct; but the American Indian is a no less inveterate enemy of the Cayman, and, when occasion offers, lets him feel the full extent of his inventive cruelty. Among the Javanese, on the contrary, we find the crocodile considered as a sacred animal, on account of his clearing the rivers and lagunes of putrefying substances; and the friendship even seems to be reciprocal, as Bennett saw Javanese convicts busy working up to their middle in water, quite near the monsters.

Like the sea-turtles, the crocodiles generally deposit their eggs, which are about the size of those of a goose, and covered with a calcareous shell, in holes made in the sand, leaving them to be hatched by the warm rays of the tropical sun. In some parts of America, however, they have been observed to resort to a more ingenious method, denoting a degree of provident instinct which could hardly have been expected in a cold-blooded reptile. Raising a small hillock on the banks of the river, and hollowing it out in the middle, they collect a quantity of leaves and other vegetable matters, in which they deposit their eggs. These are covered with the leaves, and are hatched by the heat extricated during their putrefaction, along with that of the atmosphere.

Callous to every other generous sentiment, the female Cayman continues for some time after their birth to watch over her young with great care. One day, as Richard Schomburgk, accompanied by an Indian, was busy fishing on the banks of the Essequibo, he suddenly heard in the water a strange noise, resembling the mewling of young cats. With eager curiosity he climbed along the trunk of a tree overhanging the river, about three feet above the water, and saw beneath him a brood of young alligators, about a foot and a half long. On his seizing and lifting one of them out of the water, the mother, a

creature of prodigious size, suddenly emerged with an appalling roar, making desperate efforts to reach her wriggling and screeching offspring, and increasing in rage every time Schomburgk tantalised her by holding it out to her. Having been wounded with an arrow, she retired for a few moments, and then again returned with redoubled fury, lashing the waters into foam by the repeated strokes of her tail. Schomburgk now cautiously retreated, as in case of a fall into the water below, he would have had but little reason to expect a friendly reception, the monster pertinaciously following him to the bank, but not deeming it advisable to land, as here it seemed to feel its helplessness. The scales of the captured young one were quite soft and pliable, as it was only a few days old, but it already had the peculiar musk-like smell which characterises the full-grown reptile.

The sight of the first crocodile he meets with, lying on a flat sand-bank of the Nile, is a great event in the traveller's life in Egypt. With all the eagerness of curiosity he first seizes his telescope to have a look at the monster, and then his gun, to drive, if possible, a bullet through its harnessed skin. But long before the enemy approaches, the wary reptile creeps slowly into the river, and plunging into the water, mocks all further pursuit. If the sportsman wishes to become better acquainted with the leviathan, he must wander farther to the South. The thousands of crocodile mummies piled up in the pits of Monfaloot, prove that in ancient times the dreaded reptile must have been common in the land of the Pharaohs; at present this can only be affirmed of the Sudan, where one may reckon with certainty upon finding a crocodile upon every sand-bank of the two Niles. The favourite resorts of the crocodile are quiet places in the rivers, where it can bask undisturbed in the sun; the cataracts it seems are not to its taste. It is no lover of change, for old men affirm that since their childhood they have seen the same crocodile invariably make its appearance upon the same island, nor is there reason to doubt their word, as the reptile attains an extreme old age. A life of a hundred years is exceptional with man, with the crocodile it is probably but a part of its existence. At its birth the animal issues from an egg not bigger than that of a goose; it grows very slowly like all amphibia, and yet reaches the enormous length of twenty

feet. When bursting its shell it is scarce nine inches long; after a year it attains the double, sometimes the triple length, and then grows slower. On comparing the full-grown with the new-born crocodile, one can hardly conceive how this neat little creature can ever expand to such a size.

In spite of its unwieldy appearance, the crocodile is by no means awkward in its movements. The web uniting the four toes of its hind feet, and its long oar-like tail, enable it to catch fish without difficulty, but also on land it is far from being slow. According to Brehm, an excellent observer, it moves in every direction with the greatest ease, and is able to turn in a circle, the diameter of which is about equal to its length—so that running backwards and forwards, so warmly recommended by the inventors of fables, as the best means to escape the reptile, would hardly be of use. Fortunately, the crocodile on land never gives occasion to show the fallacy of this method, as it invariably runs away at the approach of man. During his journeys in Fassokl, Dr. Penney disturbed a crocodile which had hidden itself in a heap of dried leaves. The animal fled at the approach of the riders, and ran bellowing in a direct line to the river, which was several miles distant. It was impossible to come up to it with the swiftest dromedaries.

The chief food of the gigantic reptile consists of fishes, but nothing living, which it can reach and master, comes amiss to its voracity. Land animals it generally surprises while drinking. Slowly it approaches, swimming under the surface of the water; then suddenly darts its head forward, seizes its prey, drags it into the water, and leisurely devours it, though as some believe not before the carcass is in a certain state of putrefaction. Its human victims are generally those whom it seizes while wading into the river to fetch water. The dogs in the neighbourhood of the Nile hate and fear the crocodile. While a dog born in the interior of the country will approach the stream without any signs of shyness, the others are extremely cautious, drink quickly, having all the time an attentive eye upon the water. Their hatred shows itself in their rage at sight of a great lizard.

But the natives also testify on every occasion their but too well-founded fear of the harnessed monster, for in all Sudan there is not a village on the banks of the two rivers which has

not to deplore the loss of more than one of its inhabitants from the insidious attack of the crocodile.

According to the natives, the hideous reptile possesses a true friend in a small bird (*Hyaß Ægyptiacus*), called by the Arabs Rhafih-r-el-Timsach, or the 'crocodile's guardian'—a not inappropriate name, though the bird performs the part of a guardian not from any friendly feeling but accidentally. It lives on the islands and flat banks of the Nile and its tributaries, and being extremely swift has no reason to fear the crocodile. It runs without the least hesitation over the back of the sleeping monster, feeds on the leeches and water-insects that may have settled there, and seems to consider it as harmless as a log of wood. Its habit of uttering a piercing cry at the sight of man betrays his approach to the crocodile, who generally awakes and creeps into the water.

The young of the crocodiles have no less numerous enemies than those of the snakes. Many an egg is destroyed in the hot sand by small carnivora, or birds, before it can be hatched; and as soon as the young creep out of the broken shell, and instinctively move to the waters, the herons, cranes and other long-legged wading birds gobble up many of them, so that their span of life is short indeed. In the water they are not only the prey of various sharp-toothed fishes, but even of the males of their own species, while the females do all they can to protect them. Even man not only kills the crocodile in self-defence, or for the sake of sport, but for the purpose of regaling upon its flesh. In the Siamese markets, crocodiles, large and small, may be seen hanging in the butchers' stalls; and Captain Stokes,\* who more than once supped off alligators' steaks, informs us that the meat is by no means bad.

According to one of those zoological fables which by frequent repetition usurp the authority of facts, the Ichneumon or Pharaoh's Rat, a small animal closely resembling the weasel tribe, is supposed to be the most dangerous enemy of the full grown crocodile. It is said to creep into the maw of the unwieldy reptile when asleep, to penetrate into its stomach, to tear its heart, and then with its sharp teeth to cut its way out of the dead Leviathan's body. In plain truth the Ichneumon

\* 'Discoveries in Australia.'

is a far more dangerous enemy to rats, mice, lizards, snakes and little birds, than to the huge crocodile, and instead of being esteemed for his imaginary service as he is supposed to have been by the ancient Egyptians, is detested by the fellah as the active plunderer of his pigeon cots and hen roosts. A similar fable relates that in the rivers of America, a tortoise of the genus *Cinyxis*, after having been swallowed by the alligator, and thanks to its shelly case arriving unharmed in its stomach, eats its way out again with its sharp beak, thus putting the monster to an excruciating death.

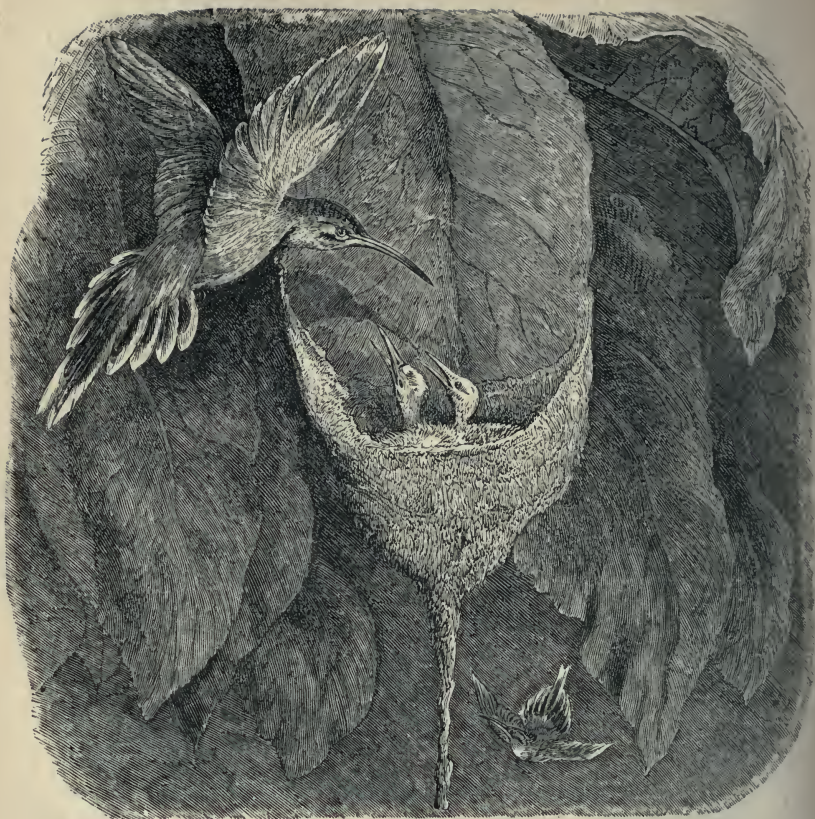
I have already mentioned, in the chapter on the Llanos, that in many tropical countries the aridity of the dry season produces a similar torpidity in reptile life to that which is caused by the cold of winter in the higher latitudes. In Ceylon, when the tanks become exhausted, the marsh-crocodiles are sometimes encountered wandering in search of water in the jungle; but generally, during the extreme drought, they bury themselves in the sand, where they remain in a state of torpor, till released by the recurrence of the rains. Sir Emerson Tennent, whilst riding across the parched bed of a tank, was shown the recess, still bearing the form and impress of the crocodile, out of which the animal had been seen to emerge the day before. A story was also related to him of an officer who, having pitched his tent in a similar position, had been disturbed during the night by feeling a movement of the earth below his bed, from which, on the following day, a crocodile emerged, making its appearance from beneath the matting.

Like the rattlesnake, crocodiles seem to possess the power of fascinating their prey, or rather of completely depriving their victims of all presence of mind, by the terror which they inspire. In Sumatra, Marsden once saw a large crocodile in a river, looking up to an overhanging tree, on which a number of small monkeys were sitting. The poor creatures were so beside themselves for fright, that instead of escaping to the land, which they might easily have done, they hurried towards the extremities of the branches, and at length fell into the water, where the dreadful monster was awaiting them.

Crocodiles sometimes indulge in strange wanderings. Chamisso mentions one having been drifted to Eap, one of the Carolines, where it was killed after having devoured a woman;

and about thirty years ago, the inhabitants of one of the Feejee Islands were equally astonished and alarmed at seeing a large crocodile emerge from the lagune, and lazily creep on shore. At first they took it for some marine deity ; but it soon proved that its visit was not of a beneficent nature, as it seized and devoured nine of them at various intervals. After many unavailing attempts to destroy the monster, it was at length caught with a sling passed over the bough of a large tree, the other end of the rope being held at a distance by fourteen men who lay concealed, while one of the party offered himself as a bait to entice the reptile to run into the snare. Captain Fitzroy ('Voyage of the Beagle'), who relates the fact, supposes that the animal must have been drifted all the way from the East Indies—a voyage which, in fact, is not more surprising than to see a turtle land upon the shores of the North Sea, or a sperm whale flounder about in the Thames.

Like many other of the lower animals, the crocodile, when surprised, endeavours to save himself by feigning death. Sir Emerson Tennent relates an amusing anecdote of one that was found sleeping several hundred yards from the water. 'The terror of the poor wretch was extreme when he awoke and found himself discovered and completely surrounded. He was a hideous creature, and evidently of prodigious strength, had he been in a condition to exert it ; but consternation completely paralysed him. He started to his feet, and turned round in a circle, hissing and clacking his bony jaws, with his ugly green eye intently fixed upon us. On being struck, he lay perfectly quiet and apparently dead. Presently he looked round cunningly, and made a rush towards the water ; but on a second blow he lay again motionless. We tried to rouse him, but without effect ; pulled his tail, slapped his back, struck his hard scales, and teased him in every way, but all in vain : nothing would induce him to move, till, accidentally, my son, a boy of twelve years old, tickled him gently under the arm, and in an instant he drew it close to his side, and turned to avoid a repetition of the experiment. Again he was touched under the other arm, and the same emotion was exhibited, the great monster twisting about like an infant to avoid being tickled.'



HUMMING-BIRDS.

## CHAPTER XXVII.

### TROPICAL BIRD LIFE.

The Toucan—Its Quarrelsome Character—The Humming-birds—Their wide Range over the New World—Their Habits—Their Enemies—Their Courage—The Cotingas—The Campanero—The Tangaras—The Manakins—The Cock of the Rock—The Troopials—The Baltimore—The *Pendulus* Nests of the Cassiques—The Mocking-bird—Strange Voices of Tropical Birds—The Goat-Sucker's Wail—The Organista—The Cilgero—The Flamingos—The Scarlet Ibis—The Jabiru—The Roseate Spoon-bill—The Jacana—The Calao—The Sun-birds—The *Melithreptes*—The Argus—The Peacock—Tropical Waders of the Old World—The African Ibis—The Numidian Crane—Australian Birds—The

Lyre Bird—The Birds of Paradise—African Weaving-birds—Social Gros-beak—The Baya—The Tailor-bird—The Honey Eaters—The Rock Warbler—The Diceum—The Bower-birds—The Talegalla—Birds of Passage.

USEFUL in many respects to man, no class of animals is more interesting or agreeable to him than that of the Birds, whether we consider the beauty of their plumage, the grace of their movements, the melody of their voice, or the instinct that regulates their migrations and prompts them to construct their nests; so that their study forms, without doubt, one of the most attractive departments in the whole range of natural history.

But it is at the same time one of the most difficult, particularly in countries where man has not yet mastered the powers of vegetation, where numberless creepers and bush-ropes render the forest impenetrable, and the pathless wilderness obstructs the observer at every step. Thus it is by no means surprising that so many secrets still veil the life of the tropical birds—that comparatively so little is known as yet of their economy and mode of existence.

Many families of birds have a wide range over the whole earth: falcons hover over the Siberian fir-woods, as over the forests of the Amazons; in every zone are found woodpeckers, owls, and long-beaked martin-fishers, while thrushes enliven with their song both the shades of the beech-woods and the twilight of the cocoa-nut groves. In the north and in the south, fly-catchers carry destruction among the numerous insect-tribes; in every latitude, crows cleanse the fields of vermin; and swallows, pigeons, ducks, gulls, petrels, divers, and plovers frequent the fields and lakes, the banks and shores in all parts of the world.

Thus the class of birds shows us a great similarity in the distribution of its various forms all over the earth; and we find the same resemblance extending also to their mode of life, their manners, and their voice. The woodpeckers make everywhere the forest resound with the same clear note, and the birds of prey possess in every clime the same rough screech so consonant to their habits, while a soft cooing everywhere characterises the pigeon-tribes. But, notwithstanding this general uniformity and this wide range of many families of birds, each zone has at the same time its peculiar ornithological features, that

blend harmoniously with the surrounding world of plants and animals, and, taking a prominent part in the aspect of nature, at once attract the attention of the stranger.

In this respect, as in so many others, the warmer regions of the globe have a great advantage over those of the temperate and glacial zones, but nowhere do the feathered tribes find a richer or wider field for their development than in the forests and swamps of tropical America, where the vegetable world revels in luxuriant growth, and myriads of insects, peopling the woods, the waters and the fields, furnish each kind according to its wants with an inexhaustible supply of food. The circumstance that man but thinly inhabits these wilds is another reason which favours the multiplication of birds, for in Europe also they would no doubt be far more numerous, if the farmer, the sportsman, and so many other enemies were not continually thinning their ranks. To these elements of destruction they are far less exposed in tropical America, and being comparatively but little disturbed, they reign, as it were, over the forest and the field, over the mountain and the plain, over the river and the lake.

By their loud cry, resembling the yelping of a puppy-dog, and the enormous disproportion of their bill, which might seem rather adapted to a bird of ostrich-like dimensions than to one not much larger than a crow, the Toucans make themselves very conspicuous in the American woods. Were it of a strong and solid texture, their huge beak would infallibly weigh them to the ground; but being of a light and cellular structure, and in some places not thicker than writing paper, they carry it easily, and leap with such agility from bough to bough, that it does not then appear preposterously large.

When flying, it gives them, indeed, a very awkward appearance, as their body always seems overweighted by the enormous beak, which makes the head bow downwards as the bird passes through the air; but the beauty of its colouring soon reconciles the eye to its disproportionate size: for the brightest red, variegated with black and yellow stripes on the upper mandible, and a stripe of the liveliest sky-blue on the lower, contribute to adorn the bill of the Bouradi, as one of the three Toucan species of Guiana is called by the Indians. Unfortunately, these brilliant tints fade after death, and even the art of a

Waterton is unable to fix and preserve their evanescent hues. The plumage of this strange bird rivals the beak in beauty of colouring, and the feathers are frequently used as ornaments by the Brazilian ladies.

A green-wood loving bird, the Toucan never wanders from the shady forests, where he may generally be seen perched on the topmost boughs of the loftiest trees, far beyond the reach of small shot, and requiring a single bullet or the Indian's poisoned arrow to bring him from his elevated situation.

Few birds are more noisy or of a more quarrelsome and imperious temper. In the rainy season his clamour is incessant, and in fair weather the woods resound at morning and evening with his yelping cry.

Schomburgk relates an anecdote of a tamed Toucan who, by dint of arrogance, assisted by his enormous beak, had made himself despot not only over the domestic fowls, but even over the larger four-footed animals of an estate in Guiana. Large and small willingly submitted to him, so that when a dispute arose among the trumpeters and hoccas of the yard, the combatants all dispersed as soon as he made his appearance, and if by chance he had been overlooked in the heat of the fray, his powerful beak soon reminded them that their lord and master was by no means inclined to tolerate disputes among his subjects. On bread being thrown among them, none of his two or four-legged subjects would have ventured to seize the smallest morsel before the Toucan had liberally helped himself. This domineering spirit even went so far that he inhospitably reminded every strange dog that came near the premises, that none durst enter his domains without his permission. There is no knowing to what lengths he might not have carried his despotism, if a powerful mastiff, one day entering the yard and taking several bones without leave, had not put an end to his tyranny. For scarcely had the Toucan perceived the intruder, when angrily rushing upon him, he attacked him with his beak. The dog at first only growled, without suffering himself to be disturbed in his meal, but as the bird continued to bite, he finally lost his patience and, snapping at the Toucan, wounded him so severely in the head that he soon after expired.

A bird with so strange a beak must naturally be expected to feed and drink in a strange manner. When the Toucan has

seized a morsel, he throws it into the air and lets it fall into his throat ; when drinking, he dips the point of his mandibles into the water, fills them by a powerful inspiration, and then throws back the head by starts. The tongue is also of a very singular form, being narrow and elongated, and laterally barbed like a feather. The Toucan builds its nest in hollow trees, preferring those cavities which can only be entered by a small aperture. According to some writers it makes the burrow for itself, using the huge beak as its tool. Most probably, how-



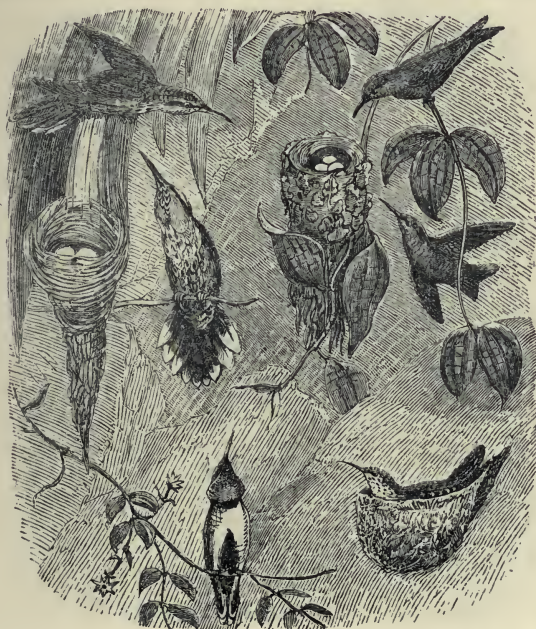
TOUCAN.

ever, it only adapts and slightly alters the interior of the hollow so as to make it more convenient for its purpose.

To paint the Humming-bird with colours worthy of its beauty, would be a task as difficult as to fix on canvas the glowing tints of the rainbow, or the glories of the setting sun. Unrivalled in the metallic brilliancy of its plumage, it may truly be called the bird of paradise ; and had it existed in the old world it would no doubt have claimed the title instead of the splendid bird which has now the honour to bear it. See with what lightning speed it darts from flower to flower ; now

hovering for an instant before you, as if to give you an opportunity of admiring its surpassing beauty, and now again vanishing with the rapidity of thought. But do not fancy that these winged jewels of the air, buzzing like bees round the blossoms less gorgeous than themselves, live entirely on the honey-dew collected within their petals; for on opening the stomach of a humming-bird, dead insects are almost always found there, which its long and slender beak, and cloven extensible tongue, like that of the woodpecker, enable it to catch at the very bottom of the tubular corollas.

The torrid zone is the chief seat of the Humming-birds, but in summer they wander far beyond its bounds, and follow the



SAWBILL HUMMING BIRD. BRAZILIAN WOOD NYMPH. WHITE-SIDED HILL STAR.

sun in his annual declensions to the poles. Thus, in the north, they appear as flying visitors on the borders of the Canadian lakes, and on the southern coast of the peninsula of Aljaschka; while in the southern hemisphere they roam as far as Patagonia, and even as Tierra del Fuego; visiting in the northern hemisphere the confines of the walrus, and reaching in the south the regions of the penguin and the lion-seal; advancing towards

the higher latitudes with the advance of summer, and again retreating at the approach of autumn.

The nests of the Humming-birds are as elegant and neat as their tiny constructors; true masterpieces of architectural instinct. Some are suspended from twigs or attached to a branch; others enjoy the shelter of some overhanging rock, and others again cling to a leaf. Spider webs are generally employed for fastening the nest to the support on which it hangs, or for interweaving the moss or the vegetable fibres used in its construction, so as to form a firm and wet-resisting mass. Soft cotton down or fine hairs line its interior, and to screen it from the piercing eye of an enemy it is frequently covered with



FIERY TOPAZ AND HERMIT.

patches of lichen, which render its external appearance as similar as possible to that of the branch on which it is placed. The nest of the Fiery Topaz, one of the most magnificent of the humming-birds, glittering in scarlet, crimson, and emerald green, is particularly curious. It is formed of a kind of tough, leathery, thick and soft fungus, like German tinder, and this apparently intractable substance the bird contrives to mould into the shape of a nest so closely resembling in colour the

branch to which it clings, that it seems more like a natural excrescence than the artificial structure of a feathered architect.

The Ruby-Throated Humming-bird, thus called from the feathers of its breast, which glitter as if made of burnished metal, and glow with alternate tints of ruby and orange, constructs a nest which even the Indian's eagle glance can hardly discover, so closely does it resemble a knob upon a branch. So fearful too is the female of detection that she does not fly straight to her home, but first shoots up perpendicularly into the air until her tiny body is lost to sight, and then darts down among the branches with such meteor swiftness that the eye cannot follow her movements, and she is quietly seated in her nest before the spectator knows exactly in which direction she has gone.

Nothing can exceed the tenderness which the male humming-bird evinces during breeding time for his lovely companion, nor the courage which he displays for her protection. On the approach of an intrusive bird, though ten times bigger than himself, he will not hesitate a moment to attack the disturber of his nest, his bravery adds a tenfold increase to his powers, the rapidity of his movements confounds his enemy, and finally drives him to flight. Proud of his success, the little champion returns to his partner, and flaps triumphantly his tiny wings. But with all his activity and courage, he is not always able to avert disaster from his nest, for an enormous bush spider, covered all over with black hair (*Mygale*), too often lurks in the vicinity, watching for the moment when the little birds shall creep out of the shell. With sudden attack it then invades the nest, and sucks their life-blood. Against this enemy neither courage nor despair are of any avail, and if the poor humming-bird endeavours to avenge the slaughter of his young, he only shares their fate. When the dark long-legged monster entwines his brilliant prey, one might almost fancy an angel of light bleeding under the talons of a demon.

From the chivalrous character of the Humming-birds it is not surprising that the most violent passions agitate their little breasts; so that in their desperate contests, they will tilt against each other with such fury, as if each meant to transfix his antagonist with his long bill. It may indeed be truly said

that these little creatures are sadly prone to quarrel over their cups, not of wine, but nectareous flowers. Frequently four or five of them may be seen engaged in a flying fight when disputing the possession of a blossoming tree in the forests of Brazil, and then they dart so swiftly through the air that the eye can scarcely follow them in their meteorlike evolutions.

As the smallest shot would blow the tiny humming-birds to pieces, and inevitably destroy the beauty of their plumage, they are taken by aspersing them with water from a syphon, or by means of a butterfly net.

There are many species of Humming-birds, various in size and habit, with straight or curved bills, with a naked or a crested head, with a short or a long tail: some constantly concealing themselves in the solitudes of the forest; while others hover round the habitations of man, and frequently during their disputes pursue each other into the apartments whose windows are left open, taking a turn round the room, as flies do with us, and then suddenly regaining the open air.

Next to the humming-birds the Cotingas display the gayest plumage in the American woods. They are, however, not often seen, for they lead a solitary life in the moist and shadowy forests, where they feed on the various seeds and fruits of the woods. One species is attired in burning scarlet, others in purple and blue, but they are all so splendidly adorned that it would be difficult to say which of them deserves the prize for beauty. Most of the Cotingas have no song; the nearly related snow-white Campanero or bell-bird, however, amply makes up for the deficient voice of his cousins, by the singularity and sweetness of his note. He is about the size of a jay. On his forehead rises a singular spiral tube nearly three inches long. It is jet black, dotted all over with small white feathers. It has a communication with the palate, and when filled with air looks like a spire, when empty it becomes pendulous. His note is



CAMPANERO.

loud and clear, like the sound of a bell. 'In the midst of the forests,' says Waterton, 'generally on the dried top of an aged mora, almost out of gun reach, you will see the Campanero. No sound or song from any of the winged inhabitants of the

forest causes such astonishment as his toll. With many of the feathered race he pays the common tribute of a song to early morn, and even when the meridian sun has shut in silence the mouths of almost the whole of animated nature, the Campanero still cheers the forest; you hear his toll, and then a pause for a minute; then another toll, and then a pause again, and then a toll and again a pause. Then he is silent for six or eight minutes, and then another toll, and so on. Actæon would stop in mid-chase, Maria would defer her evening song, and Orpheus himself would drop his lute to listen to him, so sweet, so novel and romantic, is the toll of the pretty snow-white Campanero.'

The Tangaras resemble our finches, though they are far more splendidly attired. Their plumage is very rich and diversified, some of them boast six separate colours; others have the blue, purple, green, and black so finely blended into each other that it would be impossible to mark their boundaries; while others again exhibit them strong, distinct and abrupt. The flight of the Tangaras is rapid, their manners lively. They live upon insects, seeds, berries, and many of them have a fine song. Among their numerous species, spread over all the warmer regions of America, the scarlet Piranga is pre-eminent for beauty, and when in the blooming thickets, along the woody river's banks, the meridian sun shows off his plumage in all its splendour, the huntsman pauses to admire the magnificent bird, and delays his murderous aim.

In the deep forests of Guiana and Brazil, which they never quit for the open plains, reside the Manakins (*Pipra*), pretty little birds, whose largest species scarcely attain the dimensions of the sparrow, while the smallest are hardly equal to the wren. The plumage of the full-grown male is always black, enlivened by brilliant colours, that of the female and of the young birds greenish. Their flight is rapid but short, and they generally roost on the middle branches of the trees. In the morning they unite in little troops, and seek their food, which consists of insects, and small fruit, uttering at the same time their weak but melodious notes. As the day advances they separate and seek the deepest forest-shades, where they live in solitude and silence.

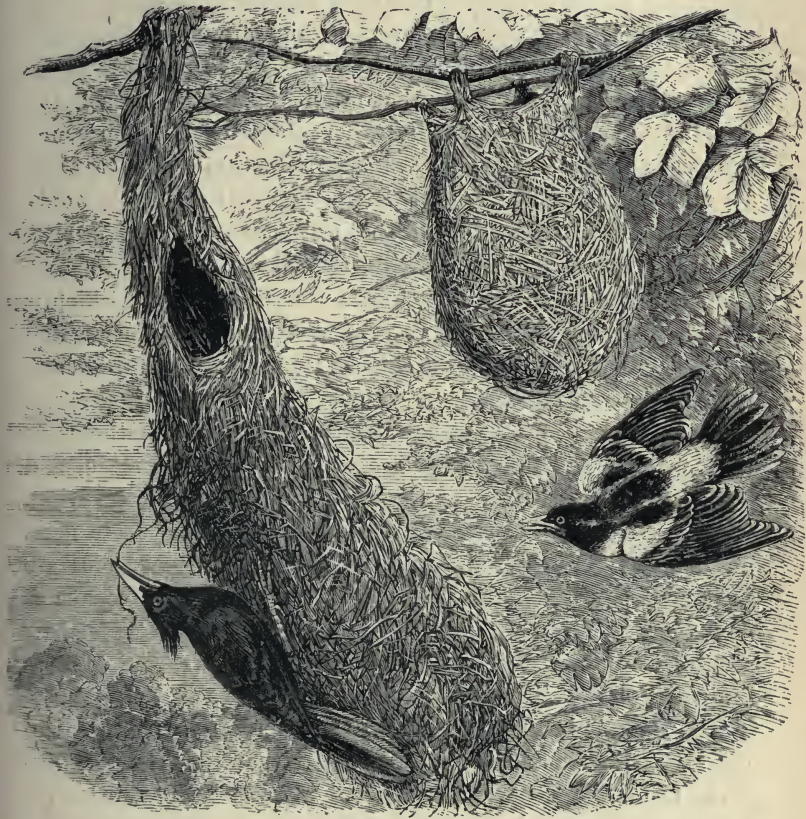
The famous orange-coloured Cock of the Rock of Guiana (*Rupicola aurantia*), which owes its name to its comb-like

crest, is nearly related to the Manakins. It is a great rarity, even in its own country, and as it dwells in the most secluded forests, is but seldom seen by travellers. Richard Schomburgk relates the following wonderful story of the bird, which, if not proceeding from so trustworthy a source, might almost be considered fabulous. 'A troop of these beautiful birds was celebrating its dances on the smooth surface of a rock; about a score of them were seated on the branches as spectators, while one of the male birds, with proud self-confidence, and spreading tail and wings, was dancing on the rock. He scratched the ground or leaped vertically into the air, continuing these saltatory movements until he was tired, when another male took his place. The females, meanwhile, looked on attentively, and applauded the performance of the dancers with laudatory cries. As the feathers are highly prized, the Indians lay in wait with their blow-pipes near the places where the Rupicolas are known to dance. When once the ball has begun, the birds are so absorbed by their amusement, that the hunter has full time to shoot down several of the spectators with his poisoned arrows, before the rest take the alarm.'

On penetrating into the wilds of Guiana, the pretty songsters called Troopials, (*Icterus*, *Xanthornus*) pour forth a variety of sweet and plaintive notes. Resembling the starling by their habits, they unite in troops, and live on insects, berries, and seeds. The variegated Troopial (*Oriolus varius*) displays a wonderful instinct in the construction of his nest, which he generally builds on fruit-trees; but when circumstances force him to select a tree whose branches have far less solidity, as, for instance, the weeping willow, his instinct almost rises to a higher intelligence. First, he binds together, by means of bits of straw, the small and flexible branches of the willow, and thus forms a kind of conical basket in which he places his nest, and instead of the usual hemispherical form, he gives it a more elongated shape, and makes it of a looser tissue, so as to render it more elastic and better able to conform to the movements of the branches when agitated by the wind.

The neat little black and orange Baltimore (*Icterus Baltimore*) constructs a still more marvellous nest on the tulip trees, on whose leaves and flowers he seeks the caterpillars and beetles which constitute his principal food. When the time comes for

preparing it, the male picks up a filament of the *Tillandsia usneoides* and attaches it by its two extremities to two neighbouring branches. Soon after, the female comes, inspects his work, and places another fibre across that of her companion. Thus by their alternate labours a net is formed, which soon assumes the shape of a nest, and as it advances towards its



CRESTED CASSIQUE.

BALTIMORE ORIOLE.

completion, the affection of the tender couple seems to increase. The tissue is so loose as to allow the air to pass through its meshes, and as the parents know that the excessive heat of summer would incommode their young, they suspend their nest so as to catch the cooler breeze of the north-east when breeding in Louisiana; while in more temperate regions, such as

Pennsylvania and New York, they always give it a southern exposition, and take care to line it with wool or cotton. Their movements are uncommonly graceful; their song is sweet; they migrate in winter towards more southerly regions, Mexico or Brazil, and return after the equinox to the United States.

The Cassiques, which are nearly related to the troopials or orioli, are no less remarkable for their architectural skill. They suspend their large pendulous nests, which are often above four feet long, at the extremities of branches of palm trees, as far as possible from all enemies that might by climbing reach the brood, often choosing, for still further protection, trees on which the wasps or maribondas have already built their nests, as these are adversaries whose sharp stings no tiger-cat or reptile would desire to face. The nest of the *Cassicus cristatus* is artificially woven of lichens, bark-fibres and the filaments of the tillandsias, while that of the *tupuba* (*Cassicus ruber*), which is always suspended over the water, consists of dry grasses, and has a slanting opening in the side, so that no rain can penetrate it. On passing under a tree, which often contains hundreds of cassique nests, one cannot help stopping to admire them, as they wave to and fro, the sport of every storm and breeze, and yet so well constructed as rarely to be injured by the wind. Often numbers of one species may be seen weaving their nests on one side of a tree, while numbers of another species are busy forming theirs on the opposite side of the same plant, and what is, perhaps, even still more wonderful than their architectural skill, though such near neighbours, the females are never observed to quarrel!

The *Cassicus Persicus*, a small black and yellow bird, somewhat larger than the starling, has been named the mocking-bird, from his wonderful imitative powers. He courts the society of man, and generally takes his station on a tree close to his house, where for hours together he pours forth a succession of ever-varying notes. If a toucan be yelping in the neighbourhood, he immediately drops his own sweet song, and answers him in equal strain. Then he will amuse his audience with the cries of the different species of the woodpecker, and when the sheep bleat he will distinctly answer them. Then comes his own song again, and if a puppy dog or a guinea fowl interrupt him, he takes them off admirably, and by his different

gestures during the time, you would conclude that he enjoys the sport.

Wild and strange are the voices of many of the American forest-birds. In the Peruvian woods the black Toropishu (*Cephalopterus ornatus*) makes the thicket resound with his hoarse cry, resembling the distant lowing of a bull; and in the same regions the fiery-red and black-winged Tunqui (*Rupicola Peruviana*) sends forth a note, which might readily be mistaken for the grunting of a hog, and strangely contrasts with the brilliancy of his plumage. But of all the startling cries that issue from the depths of the forest, none is more remarkable than the Goatsucker's lamentable wail. 'Suppose yourself in hopeless sorrow,' says Waterton, 'begin with a high, loud note, and pronounce ha, ha, ha, ha, ha! each note lower and lower till the last is scarcely heard, pausing a moment or two between every note, and you will have some idea of the mourning of the largest Goatsucker in Demerara. Four other species of goatsucker articulate some words so distinctly, that they have received their names from the sentences they utter, and absolutely bewilder the stranger on his arrival in these parts. The most common one sits down close by your door, and flies and alights three or four yards before you, as you walk along the road, crying, 'Who are you, who-who-who-who are you?' Another bids you, 'Work away, work-work-work away.' A third cries mournfully, 'Willy come go, Willy-Willy-Willy come go.' And high up in the country, a fourth tells you to, 'Whip-poor-Will, whip-whip-whip-poor-Will.'

You will never persuade the negro to destroy the birds, or get the Indian to let fly his arrow at them, for they are held to be the receptacles for departed souls, who came back again to earth, unable to rest for crimes done in their days of nature, or expressly sent to haunt cruel and hardhearted masters, and retaliate injuries received from them. If the largest goatsucker chance to cry near the white man's door, sorrow and grief will soon be inside, and they expect to see the master waste away with a slow consuming sickness. If it be heard close to the negro's or Indian's hut, from that night misfortune sits brooding over it, and they await the event in terrible suspense.

During the daytime, the Goatsucker, whose eyes, like those

of the owl, are too delicately formed to bear the light, retires to the deepest recesses of the forest, but when the sun has sunk behind the western woods, he may, on moonlight nights, be seen silently hovering in the forest glades, or hopping about among the herds. This poor bird has the character of a nocturnal thief, but never has a more unjust accusation been made, as, far from robbing the flocks of their milk, he does all he can to free them from insects. 'See how the nocturnal flies are tormenting the herd,' says Waterton, 'and with what dexterity he springs up, and catches them, as fast as they alight on the belly, legs, and udder of the animals. Observe how quiet they stand, and how sensible they seem of his good offices, for they neither strike at him, nor hit him with their tail, nor tread on him; nor try to drive him away as an uncivil intruder. Were you to dissect him, and inspect his stomach, you would find no milk there: it is full of the flies which have been annoying the herd.'

The large tropical nocturnal butterflies, or moths, form the chief food of the wide-beaked Goatsucker, and the number of their wings that may be seen lying about, give proof of the ravages he commits among their ranks. For as the bat with his hooked thumb cuts off the wings of the moths and cock-chafers which he catches on his twilight excursions, thus, also, the Goatsucker refrains from swallowing these parts, and his hooked and incurvated upper mandible seems purposely intended for clipping them.

While the Goatsucker makes the forest resound with his funereal tones, other birds of the forest pour forth the sweetest notes. Dressed in a sober cinnamon brown robe, with blackish olive-coloured head and neck, the Organist (*Troglodytes leucophrys*) enlivens the solitude of the Peruvian forests. The astonished wanderer stops to listen to the strain, and forgets the impending storm. The Cilgero, a no less delightful songster, frequents the mountain regions of Cuba, and the beauty of his notes may be inferred from the extravagant price of several hundred dollars, which the rich Havanese are ready to pay for a captive bird. Wagner ('Travels in Costa Rica,' 1854) tells us that our nightingale is far inferior to the Cilgero, who entertains his mate with the softest tones of the harmonica,

and in Guiana the flute-bird (*Cyphorinus cantans*) delights the ear with his melodious song. All these lovely musicians of the grove belong to the extensive finch tribe, and, like their European cousins, appear in a simple unostentatious garb.

The same beauty of plumage which characterises so many of the American forest-birds, adorns, likewise, the feathered tribes of the swamp and the morass, of the river and the lake. Nothing can exceed in beauty a troop of scarlet Ibises or deep red Flamingoes (*Phœnicopterus ruber*) on the green margin of a stream. Raised on enormous stilts, and with an equally disproportionate length of neck, the flamingoes would be reckoned among the most uncouth birds, if their splendid robe did not entitle them to rank among the most beautiful.

They always live in troops, and range themselves, whether fishing or resting, like soldiers, in long lines. One of the number acts as sentinel, and on the approach of danger gives a warning scream, like the sound of a trumpet, when, instantly, the whole troop, expanding their flaming wings, rise loudly clamouring into the air.

These strange-formed birds build in the swamps high conical nests of mud, in the shape of a hillock with a cavity at top, in which the female generally lays two white eggs of the size of those of a goose, but more elongated. The rude construction is sufficiently high to admit of her sitting on it conveniently, or rather riding, as the legs are placed on each side at full length. Their mode of feeding is no less remarkable. Twisting their neck in such a manner that the upper part of their bill is applied to the ground, they at the same time disturb the mud with one of their webbed feet, thus raising up from the water insects and spawn, on which they chiefly subsist.

Six feet high, and stately as a grenadier of the guards, the American Jabiru stalks along the banks of the morasses. His plumage is white, but his neck and head are black, like his long legs; his conical, sharp, and powerful black bill, is a little recurved, while that of the stork, to whom he is closely related, is straight. He destroys an incredible number of reptiles and fishes; and, being very sly, is difficult to kill.

The roseate American Spoon-bill (*Platalea Ajaja*) is particularly remarkable for his curious large beak, dilating at the

top into a broad spoon or spatula, which, though not possessed of great power, renders him excellent service in disturbing the mud and seizing the little reptiles and worms he delights to feed on.

The Jacana (*Parra jacana*) possesses enormously long and slender toes, armed with equally long spine-like claws. While pacing the ground they seem as inconvenient as the snow shoes of a Laplander, and yet nothing can be more suitable for a bird destined to stalk over the floating leaves of the Nelumbos and Nymphæas, and to seek for water insects on this unstable foundation. The Jacana is found all over tropical America, and is also called the Surgeon, from the nail of his hinder toe being sharp and acuated like a lancet.



RHINOCEROS HORNBILL.

Although in the torrid zone we hardly ever meet with a single aboriginal species of plant or animal common to both hemispheres, yet the analogy of climate everywhere produces analogous organic forms, and when on surveying the feathered tribes of America, we are struck by any bird remarkable for its singularity of shape or mode of life, we may expect to find its representative in Asia, Africa, or Australia.

Thus the enormous beak of the toucan is emulated or surpassed by that of the Indian Calao, or Rhinoceros Hornbill (*Buceros rhinoceros*) whose twelve-inch long, curved, and sharp-pointed bill, is, moreover, surmounted with an immense appendage in the form of a reverted horn, the use of which belongs as yet to the secrets of nature. While the toucans are distinguished by a gaudy plumage, the Calaos are almost entirely decked with a robe black as that of the raven, and enhancing the beautiful red and orange colours of their colossal beak. Generally congregating in small troops, like the toucans, they inhabit the dense forests, where they chiefly live on fruits, seeds, and insects, which they also swallow whole, throwing them up into the air and catching them as they fall. The clapping together of their mandibles causes a loud and peculiar noise, which towards evening interrupts the silence of the forest. The flight of a bird burdened with such a load must naturally be short: they hop upon their thick clumsy feet, and generally roost upon the highest trees.

Like the toucans, the Indian Hornbills make their nest in the hole of some decaying tree, sometimes plastering up the entrance with mud, so as to leave but a small aperture, a practice which the Korwê, a species of African Hornbill, seems invariably to follow.

The female having entered her breeding-place, in one of the natural cavities of the mopane tree, a species of *Bauhinia*, the male plasters up the entrance, leaving only a narrow slit by which to feed his mate, and which exactly suits the form of his beak. The female makes a nest of her own feathers, lays her eggs, hatches them, and remains with the young till they are fully fledged. During all this time which is stated to be two or three months, the male continues to feed her and the young family. The prisoner generally becomes quite fat, and is esteemed a very dainty morsel by the natives, while the poor slave of a husband gets so lean and weak, that on the sudden lowering of the temperature, which sometimes happens after a fall of rain, he is benumbed, falls down, and dies.

The first time Dr. Livingstone saw this bird was at Kolobeng, where he had gone to the forest for some timber. Standing by a tree, a native looked behind him and exclaimed, 'There is the nest of a korwê.' Seeing a slit only about half an inch wide and three or four inches long in a slight hollow of the tree, and thinking the word korwê denoted some small animal, he waited with interest to see what the Bechuana would extract. The latter, breaking the clay which surrounded the slit, put his arm into the hole, and brought out a tockus, or red-beaked hornbill, which he killed.

The brilliant Sun-birds or Suimangas (*Cinnyris*) of Asia and Africa, are the Colibris of the old world, equally ethereal, gay, and sparkling in their motions, flitting briskly from flower to flower, and assuming a thousand lively and agreeable attitudes. The sunbeams glittering on their bodies make them sparkle like so many gems. As they hover about the honey-laden blossoms, they vibrate rapidly their tiny pinions, producing in the air a slight whirring sound, but not so loud as the humming noise produced by the wings of the colibris. Thrusting their slender beaks into the deep-cupped flowers, they probe them with their brushlike tongues for insects and nectar. Some are emerald green, some vivid violet, others

yellow with a crimson wing, and rivalling the colibris by the metallic lustre of their plumage, they surpass them by their musical powers, for the latter can only hum, but the sun-birds accompany their movements with an agreeable chirp.



ARGUS PHEASANT.

While the superb ocellated turkey of Honduras (*Meleagris ocellata*) displays, with all the pride of a peacock, the eye-like marks of his tail and upper-coverts, the no less beautifully spotted Argus, a bird nearly related to the gold and silver pheasants which have been introduced from China into the European aviaries, conceals his splendour in the dense forests of Java and Sumatra. The wings of this magnificent creature, whose plumage is equally remarkable for variety and elegance, consist of very large feathers, nearly three feet long, the outer webs being adorned with a row of large eyes, arranged parallel to the shaft; the tail is composed of twelve feathers, the two middle ones being about four feet in length, the next scarcely two, and gradually shortening to the outer ones. Its voice is plaintive and not harsh, as in the Indian peacock, which Alexander the Great is said to have first introduced into Europe, though its feathers had many centuries before been imported by the Phœnicians. The Peacock is still found wild in many parts of Asia and Africa, but more particularly in the fertile plains of India.



JAVANESE PEACOCK.

Another species, nearly similar in size and proportions, but distinguished by a much longer crest, inhabits the Javanese forests.

The tropical wading birds of the old world are no less remarkable for beauty or size than those of equatorial America. The rose-coloured Flamingo, with red wings and black quills, adorns the creeks and rivers of tropical Africa and Asia, and in warm summers extends his migrations as far northward as Strasburg or the Rhine. The sight of a troop of flamingoes approaching on the wing and describing a great fiery triangle in the air is

360'



FLAMINGOES



singularly majestic. When about to alight, their flight becomes slower, they hover for a moment, then their evolutions trace a conical spire, and finally descending, they immediately arrange themselves in a long line, place their sentinels, and commence their fishing operations.

On the borders of Lake Menzaleh, in Egypt, thousands upon thousands of flamingoes may often be seen standing in scarlet array. The Arabs catch them in nets, or endeavour to surprise the sentinels by cautiously creeping up to them under the water, and suddenly breaking their necks before they have time to give the note of alarm. It is then easy to catch a number of the unsuspecting troop. The flamingoes are not only beautiful in appearance, but their flesh also surpasses that of most other birds in delicacy of flavour. At the renowned culinary feasts of Lucullus, their fleshy tongues, interwoven with fat, formed one of the rarest and most highly prized dishes. Many of the learned have doubted the truth of this tradition, as the Romans were unacquainted with the use of fire-arms, but Brehm,\* who thinks it would have been impossible to collect so many flamingoes by means of the noisy gun, is convinced that they were caught with nets in the swamps of Pontus, as they are now on Lake Menzaleh.

The white Ibis, who formerly made his appearance from the south, along with the swelling waters of the Nile, was revered as a sacred bird by the Egyptians, as the herald of the abundance which the growing river was about to scatter over the inundated land. They paid him divine honours, they embalmed his remains with the same spices which served to preserve the corpses of princes from decay, and the pyramid of Sakkarah served as the mausoleum of countless thousands of Ibises. At present, however, the sacred bird, as if resenting the deprivation of his ancient honours, no longer makes his appearance in Egypt, for he is never met with beyond the northern



EGYPTIAN IBIS.

\* 'Reiseskizzen aus Nord-Öst-Afrika.'

boundary of the tropical rains. When the Blue and White Nile begin to rise, he builds his rude nest among the branches of the thorny bushes, in an inundated part of the primitive forest, and lays in September three or four snow-white or yellow-speckled eggs, which are hatched in a few weeks, and find abundant food in the countless worms and insects generated in the swampy grounds.

Few wading birds are more remarkable for grace of form and elegance of deportment than the Demoiselle, or Numidian Crane, so that Linnæus justly gave it the name of virgin (*Grus virgo*). Like the ibis it is easily domesticated, and daily gains upon the affections of its master by the numerous proofs of attachment and intelligence which it gives him. With maidenish care it preserves its silken plumage from every spot or defilement, and enhances its beauty by the arts of an amiable coquetry. With our Common Cranes (*Grus cinerea*) it hibernates on the sand-banks of the tropical Nile, where it meets the crowned Demoiselle (*Grus Pavonia*), which, in spite of its more gorgeous plumage, is a far less attractive bird. When sailing about the middle of October on one of the two chief rivers of East Sudan, the traveller sees day and night flocks of Cranes fly past and settle for the winter on some appropriate spot. They consist of common and Numidian Cranes. The latter have been found breeding in summer on the banks of the Wolga, and very rarely in Germany, but no one knows where the thousands which assemble in the Sudan spend their summer months. The Demoiselle, a rare bird in most collections, is there met with in such multitudes as literally to cover a large sand island. All the cabinets of Europe might be largely provided with specimens, if the bird was not so extremely intelligent, shy, and cautious. It evades every snare, and constantly keeps at a respectful distance from the sportsman's gun. Brehm chose the night for its chase, and found that when the moon shone, it used to fly once as high again as when protected by darkness.

The ornithological wonders of Australia and its neighbouring islands are inferior to those of no other part of the world. Though of less dazzling splendour than the peacock's tail, that of the Menura, or Lyre-bird, is unrivalled for its elegance. Fancy two large, broad, black and brown striped feathers,

curved in the form of a Grecian lyre, and between both, other feathers, whose widely distanced silken barbs envelope and surmount them with a light and airy gauze. No painter could possibly have imagined anything to equal this masterpiece of nature, which its shy possessor conceals in the wild bushes of Australia.

‘Of all the birds I have ever met with,’ says Mr. Gould, ‘the *Menura* is by far the most difficult to procure. While among the bushes, on the coast or on the sides of the mountains in the interior, I have been surrounded by those birds pouring forth their loud and liquid calls for days together, without being able to get a sight of them, and it was only by the most determined perseverance and extreme caution that I was enabled to effect the desired object.’

The Lyre-bird is constantly engaged in traversing the bush from mountain-top to the bottom of the gullies, whose steep and rugged sides present no obstacle to its long legs and powerful muscular thighs. When running quickly through the bush, it carries the tail horizontally, that being the only position in which it could be borne at such times. Besides its loud, full cry, which may be heard at a great distance, it has an inward and varied song, the lower notes of which can only be heard when you have stealthily approached to within a few yards of the bird when it is singing. Its habits appear to be solitary, seldom more than a pair being seen together. It constructs a large nest, formed on the outside of sticks and twigs, like that of a magpie, and lined with the inner bark of trees and fibrous roots.

In the neighbouring regions of Papua or New Guinea, and the small isles in their immediate vicinity, extending only a few degrees on each side of the Equator, we find the seat of the wondrous Birds of Paradise, thus named from that peculiar union of splendour and elegance which seems to render them more worthy of the gardens of Eden than of a terrestrial home.

The great Bird of Paradise (*P. apoda*) may justly be said to surpass in beauty the whole of the feathered creation. The throat is of the brightest emerald, and the canary-coloured neck blends gradually into the fine chocolate of the other parts of the body. From under the short chestnut-coloured wings project the long delicate and gold-coloured feathers whose

beautiful and graceful tufts are equally valued by the princes of the East and the ladies of England. The chocolate-coloured tail is short, but two very long shafts of the same hue considerably exceed in length even the long, loose plumes of the sides.



BIRD OF PARADISE.

Unable to fly with the wind, which would destroy their loose plumage, the Birds of Paradise take their flight constantly against it, being careful not to venture out in hard blowing weather. The Papuas climb, during the night, upon the high forest trees, where they have observed the birds to roost, and patiently await the dawn to catch them in nooses, or to shoot them with blunted arrows. The Portuguese first found these birds on the island of Gilolo, and as the Papuas tear off their legs before bringing them to market, it was for a long time supposed that they were destitute of these organs. The most absurd fables were founded on this imaginary deficiency: it was said that they passed their whole life sailing in the air, dew being their only food; that they never took rest, except by suspending themselves from the branches of trees by the shafts of their two elongated tail feathers; that they never touched the earth till the moment of their death; and the Malays still believe that they retire for breeding to the groves of Paradise. It is almost superfluous to add that the researches of modern travellers have fully proved the utter fallacy of these ridiculous tales.

The wondrous pendulous nests of the American Cassiques and Baltimores are equalled, if not surpassed, by those of the African Weaving Birds. These tiny architects generally suspend their structures to the ends of slender twigs, small branches, leaves or reeds, where they dangle freely in the air, and dance about merrily at every breeze. For greater security, many species always hang their nests over water, at no great distance above the surface, so that, however small the animal, monkey, or snake may be that would attempt to rob the bird of its young brood, its weight is more than sufficient to cause its immersion in the water, and thus put a stop to its burglarious intentions. As a further annoyance, the baffled invader may

expect soon to have a troop of birds swarming about him like so many scolding beldames, for the weavers never can see one of their enemies without flying up to it with hoarse screams, shooting close to its body, and, when an opportunity offers, indulging in a passing peck.

The nests of the various species of weavers are very dissimilar in shape and design ; some very long, others very short ; some



SOCIABLE WEAVER BIRD.

having their entrance from below, others at the side, and others again from near the top. Some are made of delicate fibres, and others of coarse grass ; some are of so loose a texture that the eggs can plainly be seen through them, while others are so strong and thick that they will bear the roughest handling without going to pieces. That of the Mahali Weaver, a pretty bird about as large as our common starling, resembles in shape a Florence oil-flask, but instead of

being smooth on the exterior, the ends of the thick grass stalks of which it is made, protrude like 'quills upon the fretful porcupine,' and pointing towards the mouth of the nest, which hangs downwards, serve as eaves whereby the rain is thrown off the nest.

If the dwellings made by the generality of Weavers may be likened to detached villas, each built apart from its neighbour, those of the social Grosbeak of South Africa, an allied species, deserve the name of populous cities, for here we find hundreds of feathered architects uniting their labours in the construction of one vast nest often large enough to shelter five or six men.

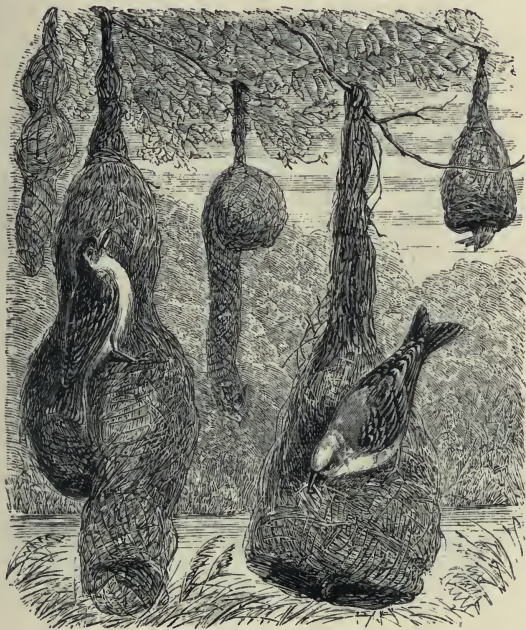
The material used is the tough and wiry Bushman's grass; the tree usually chosen for the suspension of the nest, is a species of acacia, the giraffe thorn, which derives its name from its constituting the chief food of the beautiful camelopard, and on account of its size and the umbrella-shaped disposition of its foliage is a great ornament to the arid wastes of Caffraria.

The instinct of the birds seems to have pointed out to them that it is peculiarly adapted for the purpose, as its smooth and polished bark keeps off many an enemy who, if he could ascend the stem, would be but too happy to give them a friendly call; and besides, the wood is extremely hard and tough, so that the branches are able to bear the great weight of the nests.

When about to make a new construction, the birds hang the Bushman's grass over a suitable branch, and by means of weaving and plaiting it, form a roof of some little size. Under this cover are sheltered a quantity of nests, increasing in number with each new brood, for although the same nest-mass is occupied for several successive seasons, the birds never breed in the same nests a second time.

In consequence of this custom, when they have to provide for a new brood, they enlarge the roof, and build a second row of nests just like the combs of a hornet's habitation. Layer after layer is thus added, until the mass, spreading out like an extended umbrella, attains so enormous a size as to be easily mistaken by the traveller for a thatched dwelling erected by the natives in arboreal elevation, as a defence against wild beasts. Ultimately the branch, however strong, breaks under the accumulated weight, and comes crashing to the ground; an

accident which fortunately leaves the breeding months undisturbed, as it generally occurs during the rainy season after the dried grass has absorbed a vast quantity of moisture. One of the wonders of these prodigious nests is that the birds should be able so easily to find their way to their own particular home. Of all the hundreds of holes with which these nest-cities are frequently pierced, one is as like as possible to the other, yet notwithstanding this similarity the inmates glide in and out without any hesitation.



BAYA SPARROW.

On turning to Asia we likewise find many admirable nest-builders. Among these the Baya, or Toddy Bird, is one of the most curious. In shape it resembles the sparrow, as also in the brown feathers of the back and wings; the head and breast are of a bright yellow, and in the rays of a tropical sun have a splendid appearance when the birds are flying by thousands in the same grove. They make a chirping noise, but have no song; they associate in large communities, and cover clumps of palmyras, acacias, and date-trees with their nests. These are

formed in a very ingenious manner by long grass woven together in the shape of a bottle, and suspended by so slender a thread to the end of a flexible branch that even the squirrel dare not venture his body on so fragile a support, however his mouth may water at the eggs and prey within. These nests contain several apartments, appropriated to different purposes : in one the hen performs the office of incubation ; another, consisting of a little thatched roof and covering a perch without a bottom, is occupied by the male, who cheers the female with



THE TAILOR BIRDS.

his chirping note. The Hindoos are very fond of these birds for their docility and sagacity ; when young, they teach them to fetch and carry, and at the time the young women resort to the public fountains their lovers instruct the baya to pluck the tica or golden ornament from the forehead of their favourite and bring it to their master.

The Tailor-bird of Hindostan (*Sylvia sutoria*) is equally curious in the structure of its nest, and far superior in the elegance and variety of its plumage, which in the male glows with the varied tints of the colibri. Selecting a suitable leaf,

generally one which hangs from the end of a slender twig, the little artist pierces a row of holes along each edge, using his beak as a shoemaker uses his awl. When the holes are completed the feathered tailor next selects his thread, which is a long fibre of some plant, and passing it through the holes, draws the sides of the leaf towards each other, so as to form a kind of hollow cone, the point downwards. Generally a single leaf answers the purpose, but whenever the bird cannot find one sufficiently long, it sews two together, or even fetches another leaf and fastens it with the fibre. The interior of the hollow is then lined with a quantity of soft white down, and thus a warm, light, and elegant nest is constructed, scarcely visible among the foliage, and safe from the attacks of almost every foe but man. Who, on witnessing these miracles of instinct, would not exclaim with the poet :

Behold a bird's nest !  
 Mark it well, within, without !  
 No tool had he that wrought, no knife to cut ;  
 No nail to fix, no bodkin to insert,  
 No glue to join : his little beak was all !  
 And yet how neatly finish'd ! What nice hand,  
 With every implement and means of art,  
 Could compass such another ?

The Honey Eaters of Australia and the neighbouring archipelagoes, where they seem to occupy the position which is taken in America by the humming birds, and by the sun birds of Asia and South Africa, have thus been named from their feeding largely on the sweet juices of many flowers, although the staple of their diet consists of insects. Some are splendidly decorated, others captivate the ear by their melodious song. They are most lively and interesting birds, affording an endless fund of amusement to the careful observer. Never still, they traverse the branches of the trees with astonishing celerity, skipping from one to another, and probing every crevice with their needle-like tongue. Like the humming birds they display great ingenuity in the building of their nests which the Singing and Painted Honey Eaters (*Ptilotus sonorus* ; *Eutomophila picta*) suspend from the long and slender branches of the pendulous Acacia, while the Lanceolate Honey Eater, thus named on account of the shape of its feathers, slings its hammock just as a seaman slings his oscillating couch.

The Lanceolated Honey Eater chooses for the site of its pendulous dwelling the thinnest twigs which grow at the summit of the enormous gum trees; where, owing to the great height at which it is placed and the surrounding leaves, even the eagle eye of the native Australian can with difficulty detect it; while the White Throated Honey Eater (*Entomophila*



*Ptilopus sonorus*,  
*Sericornis citreogularis*.

*Entomophila picta*.

*Entomophila albugularis*,  
*Oriigma rubricata*.

*albugularis*), detesting the wind, loves to frequent the dense mangrove thickets which edge the bays and creeks. In these places, often scarcely two feet from the water, and invariably so placed as to be under the protection of a spray of leaves, may be found its curious nest, which is about as large as a breakfast cup, and very much the same shape.

Besides the Honey Eaters, Australia has many other expert nest-builders, such as the Rock Warbler (*Origma rubricata*), which suspends its nest from the rocks in sheltered places, wherever an overhanging ledge affords protection from the elements; the *Sericornis citreogularis*, which constructs its dwelling in the centre of the large masses of moss which in the Australian forests often accumulate at the extremities of droop-



SWALLOW DICÆUM.

ing branches, and the brilliantly coloured Swallow Dicæum (*Dicæum hirundinaceum*), which hangs its pretty nest from the tops of the tallest Casuarinas, where its minute body can scarcely be seen without the assistance of glasses; but nothing can be more extraordinary than the constructions of the Bower Birds, which are built not for the useful purpose of containing the young, but purely as a playing place or an assembly room.

‘The structures of the spotted bower bird,’ says Mr. Gould, ‘are in many instances three feet in length. They are outwardly built of twigs, and beautifully lined with tall grasses, so disposed that their heads nearly meet; the decorations are very profuse, and consist of bivalve shells, crania of small mammalia, and other birds. Evident and beautiful indications of design are manifest throughout the whole of the bower and decorations formed by this species, particularly in the manner in which the stones are placed within the bower, apparently to keep the grasses with which it is lined fixed firmly in their places. These stones diverge from the mouth of the run on each side, so as to form a little path, while the immense collection of decorative materials, bones, shells, &c., are placed in a heap before the entrance of the avenue, this arrangement being the same at both ends. I frequently found these structures at a considerable distance from the rivers, from the borders of which they alone could have procured the shells and small round pebbly stones; their collection and transportation must, therefore, be a task of great labour and difficulty. As these birds feed almost entirely upon seeds and fruits, the shells and bones cannot have been collected for any other purpose than ornament; besides, it is only those that have been bleached perfectly white in the sun, or such as have been roasted by the natives, and by this means whitened, that attract their attention.’ For what purpose these curious bowers are made is not yet, perhaps, fully understood; they are certainly not used as a nest, but as a place of resort, where the assembled birds run through and about the bower in a playful manner, and that so frequently that it is seldom entirely deserted.

The Talegalla or Brush-turkey is a no less interesting Australian bird. In appearance it is very like the common



LATHAMI TALEGALLA.

black turkey, but is not quite so large: the extraordinary manner in which its eggs are hatched constitutes its singularity. It collects together a great heap of decaying vegetables as the place of deposit of its eggs, thus making a hot-bed, arising from the decomposition of the collected matter, by the heat of which the young are

hatched. This mound varies in quantity from two to four cartloads, and is of a perfectly pyramidal form: it is not, however, the work of a single pair of birds, but the result of the united labour of many, and the same site appears to be resorted to for several years in succession. 'The mode,' says Mr. Gould, 'in which the materials composing these mounds are accumulated is equally singular, the bird never using its bill, but always grasping a quantity in its foot, throwing it backwards to one common centre, and thus clearing the surface of the ground to a considerable distance so completely that scarcely a leaf or blade of grass is left.' The heap being accumulated and time allowed for a sufficient heat to be engendered, the eggs, each measuring not less than four inches in length—an enormous size, considering the bulk of the bird—are deposited, not side by side, as is ordinarily the case, but planted at the distance of nine or twelve inches from each other, and buried at nearly an arm's depth perfectly upright, with the large end upwards; they are covered up as they are laid, and allowed to remain until hatched. After six weeks of burial, the eggs, in succession and without any warning, give up their chicks—not feeble, but full-fledged and strong, so that at night they scrape holes for themselves, and lying down therein are covered over by the old birds and thus remain until morning. The extraordinary strength of the newly-hatched birds is accounted for by the size of the shell, since in so large a space it is reasonable to suppose that the young ones would be much more developed than is usually found in eggs of smaller dimensions. Other Australian birds, such as the Jungle-fowl (*Megapodius tumulus*), Duperrey's Megapodius (*M. Duperreyii*), which inhabits the forests of New Guinea, and the Leipoas or native pheasants, construct similar mound-like nests. Those of the jungle-fowl, observed at Port Essington, are described as fifteen feet high, and sixty in circumference at the base, and so enveloped in thickly foliaged trees as to preclude the possibility of the sun's rays reaching any part of it.

The tropical forests of the eastern hemisphere resound with bird-cries no less appalling, wild, or strange than those of the western world. In the close jungles of Ceylon one occasionally hears the call of the Copper-smith (*Megalasara Indica*), whose

din resembles the blows of a smith hammering a cauldron, or the strokes of the great orange-coloured Woodpecker (*Brachypterus aurantius*), as it beats the decaying trees in search of insects; but of all the yells that fancy can imagine there is none to equal that of the Singhalese Devil-bird or Gualama. 'Its ordinary cry,' says Mr. Mitford, 'is a magnificent clear shout like that of a human being, which can be heard at a great distance, and has a fine effect in the silence of the closing night. It has another cry like that of a hen just caught, but the sounds which have earned for it its bad name, and which I have heard but once to perfection, are indescribable; the most appalling that can be imagined, and scarcely to be heard without shuddering. I can only compare it to a boy in torture, whose screams are being stopped by being strangled. On hearing this dreadful note the terrified Singhalese hurries from the spot, for should he chance to see the bird of ill omen he knows that his death is nigh. A servant of Mr. Baker's,\* who had the misfortune of seeing the dreaded gualama, from that moment took no food, and thus fell a victim to his superstitious despair. This horror of the natives explains the circumstance that it is not yet perfectly ascertained whether the devil-bird is an owl (*Syrnium*) or a night hawk.

As if to make amends for this screech, the robin of Nueraellia, the long-tailed thrush, the oriole, the dayal-bird, and some others equally charming, make the forests and savannas of the Kandyan country resound with the rich tones of their musical calls.

Besides the vast number of birds which, constantly attached to a sultry climate, breed and live within the tropics, there are others who at the approach of winter leave the uncongenial regions of the temperate or frigid zones, and in search of food and warmth migrate towards the equatorial world. Thus our house swallow annually wanders as far as the unknown heart of Africa, resting neither in Egypt nor in Nubia, nor even in the insect-teeming steppes and woods of Eastern Sudan, and the stork, who every spring appears as a welcome guest in the lowlands of Northern Germany, has frequently spent the previous winter months in South Nubia and Darfur. In Kordofan (16°

\* Baker's 'Eight Years' Wanderings in Ceylon,' vol i. p. 167.

35 N. Lat.) the naturalist hears with astonishment the dactylic (- - -) note of the quail, which may have sounded in summer in Great Britain or Sweden, or meets with our charming songster the nightingale, who, likewise, wings his flight towards unknown regions, far beyond the tropics, where however his voice is mute.



LANCEOLATE HONEY EATER.



THE CONDOR.

## CHAPTER XXVIII.

### TROPICAL BIRDS OF PREY.

The Condor—His Marvellous Flight—His Cowardice—Various Modes of Capturing Condors—Ancient Fables circulated about them—Comparison of the Condor with the Albatross—The Carrion Vultures—The King of the Vultures—Domestication of the Urubu—Its Extraordinary Memory—The Harpy Eagle—Examples of his Ferocity—The Oricou—The Bacha—His Cruelty to the Klipdachs—The Fishing Eagle of Africa—The Musical Sparrow-hawk—The Secretary Eagle.

**T**HE flight of the Condor is truly wonderful. From the mountain-plains of the Andes, the royal bird, soaring aloft, appears only like a small black speck on the sky, and a few hours afterwards he descends to the coast and mixes his loud screech with the roar of the surf. No living creature rises *voluntarily* so high, none traverses in so short a time all the climates of the globe. He rests at night in the crevices of the rocks, or on some jutting ledge; but as soon as the first rays of the sun light the high mountain peaks, while the darkness of night still rests upon the deeper valleys, he stretches forth his neck, shakes his head as if fully to rouse himself, stoops over the brink of the abyss, and flapping his wings, dives into the aerial ocean. At first his flight is by no means strong; he sinks as if borne down by his weight; but soon he ascends, and

sweeps through the rarefied atmosphere without any perceptible vibratory motion of his wings. 'Near Lima,' says Mr Darwin, 'I watched several condors for nearly half an hour without once taking off my eyes. They moved in large curves, sweeping in circles, descending and ascending without once flapping. As they glided close over my head, I intently watched from an oblique position the outlines of the separate and terminal feathers of the wing; if there had been the least vibratory movement these would have blended together, but they were seen distinct against the blue sky. The head and neck were moved frequently and apparently with force, and it appeared that the extended wings formed the fulcrum on which the movements of the neck, body, and tail acted. If the bird wished to descend, the wings were for a moment collapsed, and then, when again expanded with an altered inclination, the momentum gained by the rapid descent seemed to urge the bird upwards with the even and steady movement of a paper kite.'

Like other vultures, the condor feeds only upon dead carcasses, or on new-born lambs and calves, whom he tears from the side of their mothers. He thus does so much damage to the herds, that the shepherds pursue and kill him whenever they can. As even a bullet frequently glances off from his thick feathery coat, the natives never use fire-arms for his destruction, but make use of various traps, of the sling, or of the *bolos*, which they are able to throw with marvellous dexterity.

In the Peruvian province of Abacay, an Indian provided with cords conceals himself under a fresh cow's skin, to which some pieces of flesh are left attached. The condors soon pounce upon the prey, but while they are feasting, he fastens their legs to the skin. This being accomplished, he suddenly comes forth; and the alarmed birds vainly flap their wings, for other Indians hurry towards them, throw their mantles or their lassos over them, and carry the condors to their village, where they are reserved for the next bull fight. For a full week before this spectacle is to take place, the bird gets nothing to eat, and is then bound upon the back of a bull which has previously been scarified with lances. The bellowing of the poor animal, lacerated by the famished vulture, and vainly striving to cast off its tormentor, amuses what may well be called the 'swinish multitude.'

In the province of Huarochirin there is a large natural funnel-shaped excavation, about sixty feet deep, with a diameter of about eighty feet at the top. A dead mule is placed on the brink of the precipice. The tugging of the condors at the dead carcase causes it to fall into the hole; they follow it with greedy haste, and having gorged themselves with food, are unable again to rise from the narrow bottom of the funnel. In a somewhat similar manner condors are caught in Peru, Bolivia, and Chili, and are frequently brought to Valparaiso and Callao, where they are sold for a few dollars to the foreign ships, and thence conveyed to Europe.

The condor, though a very large bird, about four feet long and measuring at least three yards from tip to tip of his extended wings, is far from attaining the dimensions assigned to him by the earlier writers and naturalists, who, emulating Sinbad the Sailor, in his account of the fabulous roc, described him as a giant whose bulk darkened the air.

The condor reminds us of the Albatross. As the former sweeps in majestic circles high above the Andes, the latter soars gracefully over the ocean, 'and without ever touching the water with his wings, rises with the rising billow and falls with the falling wave.'\* If the wonderful power of wing which bears the condor, often within the space of a few hours, from the sea-shore into the highest regions of the air, and the strength of breast which is able to support such changes of atmospheric pressure, may well raise our wonder, the indomitable pinions of the albatross are no less admirable. Both are unable to take



TURKEY BUZZARD.

wing from a narrow space, and both finally, so lordly in their movements, feed in the same ignoble manner, the condor pouncing from incredible distances upon the carcase of the mule or lama, while the albatross gorges upon the fat of the stranded whale.

While the condor is considered an enemy to man, the Gallinazos, turkey-buzzards, or common American Carrion Vultures (*Vultur aura*, *V. urubu*), are very serviceable to him,

\* 'The Sea and its Living Wonders,' p. 139.



CONDOR CATCHING.



by consuming the animal offals which, if left to putrefaction, would produce a pestilence. Thus they generally, in tropical America, enjoy the protection of the law, a heavy fine being imposed upon the offender who wantonly kills one of these scavengers. It is consequently not to be wondered at that, like domestic birds, they congregate in flocks in the streets of Lima, and sleep upon the roofs of the houses.

According to Mr. Wallace the Carrion Vultures, though commonly supposed to have very acute olfactory nerves, depend entirely on sight in seeking out their food. While he was skinning a bird, a dozen of them used to be always waiting attendance at a moderate distance. The moment he threw away a piece of meat they would all run up to seize it; but it frequently happened to fall in a little hollow of the ground or among some grass, and then they would hop about, searching within a foot of it, and very often go away without finding it. A piece of stick or paper would bring them down just as rapidly, and after seeing what it was they would quietly go back to their former places. They always choose elevated stations, evidently to see what food they can discover, and when soaring at an immense height in the air, they will descend where some animal has died long before it emits any strong smell.

It is a remarkable fact that, though hundreds of gallinazos may be feeding upon a carcase, they immediately retire when the King of the Vultures (*Sarcoramphus papa*) makes his appearance, who yet is not larger than themselves. Perching on the neighbouring trees, they wait till his majesty—a beautiful bird, with a gaudily coloured head and neck—has sufficiently gorged himself, and then pounce down with increased voracity upon their disgusting meal.

The Indians of Guiana sometimes amuse themselves with catching a gallinazo by means of a piece of meat attached to a hook, and decking him with a variety of strange feathers, which they attach to him with soft wax. Thus travestied, they turn him out again among his comrades, who, to their great delight, fly in terror from the nondescript; and it is only after wind and weather have stripped him of his finery that the outlaw is once more admitted into their society.

When full of food this vulture, like the other members of his

tribe, appears an indolent bird. He will stand for hours together on a branch of a tree, or on the top of a house, with his wings drooping, or after rain, spreading them to catch the rays of the sun. But when in quest of prey, he may be seen soaring aloft on pinions which never flutter, and at the same time carry him with a rapidity equal to that of the golden eagle. Scarcely has he espied a piece of carrion below, when, folding his broad wings, he descends with such speed as to produce a whistling sound, resembling that of an arrow cleaving the air.

The gallinazos when taken young can be so easily tamed that they will follow the person who feeds them for many miles. D'Orbigny even mentions one of these birds that was so attached to its master that it accompanied him, like a dog, wherever he went. During a serious illness of its patron, the door of the bedroom having been left open, the bird eagerly flew in, and expressed a lively joy at seeing him again.

The Harpy Eagle (*Thrasaëtus harpyia*) is one of the finest of all the rapacious birds. The enormous development of his beak and legs, and his consequent strength and power in mastering his prey, correspond with his bold and noble bearing and the fierce lustre of his eye. His whole aspect is that of formidably organised power, and even the crest adds much to his terrific appearance. 'Among many singular birds and curiosities,' says Mr. Edwards, in his 'Voyage up the Amazon,' 'that were brought to us, was a young harpy eagle, a most ferocious looking character, with a high crest and a beak and talons in correspondence. He was turned loose into the garden, and before long gave us a sample of his powers. With erected crest and flashing eyes, uttering a frightful shriek, he pounced upon a young ibis, and quicker than thought had torn his reeking liver from his body. The whole animal world there was wild with fear.'



HARPY EAGLE.

The harpy attains a greater size than the common eagle. He chiefly resides in the damp lowlands of tropical America, where Prince Maximilian of Neu Wied met with him only in the dense forests, perched on the high branches. The monkey, vaulting by means of his tail from tree to tree, mocks the pursuit of the tiger-cat and boa, but woe to him if the harpy spies him out, for seizing him

with lightning-like rapidity, he cleaves his skull with one single stroke of his beak.

Fear seems to be totally unknown to this noble bird, and he defends himself to the last moment. D'Orbigny relates that one day, while descending a Bolivian river in a boat with some Indians, they severely wounded a harpy with their arrows, so that it fell from the branch on which it had been struck. Stepping out of the canoe, the savages now rushed to the spot where the bird lay, knocked it on the head, and tearing out the feathers of its wings, brought it for dead to the boat. Yet the harpy awakened from his trance, and furiously attacked his persecutors. Throwing himself upon D'Orbigny he pierced his hand through and through with the only talon that had been left unhurt, while the mangled remains of the other tore his arm, which at the same time he lacerated with his beak. Two men were hardly able to release the naturalist from the attacks of the ferocious bird.

On turning from the New to the Old World, we find other but not less interesting raptorial birds sweep through the higher regions of the air in quest of prey. The gigantic oricou, or Sociable Vulture (*Vultur auricularis*), inhabits the greater part of Africa, and builds his nest in the fissures of rocks on the peaks of inaccessible mountains. In size he equals the condor, and his flight is not less bold; leaving his lofty cavern at dawn, he rises higher and higher, till he is lost to sight; but, though beyond the sphere of human vision, the telescopic eye of the bird is at work. The moment any animal sinks to the earth in death, the unseen vulture detects it. Does the hunter bring down some large quadruped, beyond his powers to remove, and leave it to obtain assistance?—on his return, however speedy, he finds it surrounded by a band of vultures, where not one was to be seen a quarter of an hour before.



SOCIABLE VULTURE.

Le Vaillant having once killed three zebras, hastened to his camp, at about a league's distance, to fetch a wagon; but on returning he found nothing but the bones, at which hundreds of oricous were busy picking. Another time, having killed a gazelle, he left the carcase on the sand, and retired into the

bushes to observe what would happen. First came crows, who with loud croakings wheeled round the dead animal: then after a few minutes kites and buzzards appeared, and finally he saw the oricous descending from an enormous height. They alighted upon the gazelle, and soon hundreds of raptorial birds were assembled. Thus the small robbers had first pointed out the way to those of middle size, who in their turn roused the attention of the bandits of a higher order; and none of them came too short, for after the powerful oricous had dismembered the carcass, some very good morsels remained for the buzzards, and the bones furnished excellent pickings for the crows.

The Bacha (*Falco bacha*, Daudin) inhabits India and Africa, where he sits for days on the peak of precipitous cliffs, on the look-out for rock-rabbits (*Hyrax Capensis*). These poor animals, who have good reason to be on their guard, venture only with the greatest caution to peep out of the caves and crevices in which they take up their abode, and to which they owe their Dutch name of 'klipdachs.' Meanwhile the bacha remains immovable, as if he were part of the rock on which he perches, his head muffled up in his shoulders, but watching with a sharp eye every movement of his prey, until, finally, some unfortunate klipdachs venturing forth, he darts upon him like a thunderbolt. If this rapid attack proves unsuccessful, the bacha slinks away, ashamed, like a lion that has missed his spring, and seeks some new observatory, for he is well aware that no rock-rabbit in the neighbourhood will venture to stroll out during the remainder of the day. But if he succeeds in seizing the klipdachs before it has time to leap away, he carries it to a rocky ledge, and slowly tears it to pieces. The terrible cries of the animal appear to sound like music in his ears, as if he were not only satisfying his hunger but rejoicing in the torments of an enemy. This scene of cruelty spreads terror far and wide, and for a long time no klipdachs will be seen where the bacha has held his bloody repast.

The Fishing Eagle of Africa (*Haliastur vocifer*), first noticed by Le Vaillant, may be seen hovering about the coasts and river-mouths of that vast continent. He is never found in the interior of the country, as the African streams are but thinly stocked with fish, which form his principal food. 'Elastic and buoyant, this agile dweller in the air mounts to soaring heights

scanning with sharp and piercing eye the motions of his prey below. Energetic in his movements, impetuous in his appetites, he pounces with the velocity of a meteor on the object of his wishes, and with a wild and savage joy tears it to pieces. His whole sense of existence is the procuring of food, and for this he is ever on the alert, ever ready to combat, to ravage, and destroy.\* He generally devours his prey on the nearest rock, and loves to return to the same spot where the bones of gazelles and lizards may be seen lying about, a proof that his appetite is not solely confined to the finny tribes. When these birds are sitting, they call and answer each other with a variously-toned shriek which they utter under curious movements of the head and neck.

While all other raptorial birds croak or shriek, the musical Sparrow Hawk of Africa (*Melierca musicus*, Gray) pours forth his morning and evening notes to entertain his mate while she is performing the business of incubation. Every song lasts a minute, and then the hunter may approach, but during the pause he is obliged to remain perfectly quiet, as then the bird hears the least noise and immediately flies away.

The prowess of the Secretary Eagle (*Serpentarius cristatus*) attacking the most venomous serpents has already been mentioned. The long legs of this useful bird, which owes its name of secretary to the crest on the back of its head, reminding one of the pen stuck behind the ear, according to the custom of writing-clerks, might give one reason to reckon it, at first sight, among the cranes or storks, but its curved beak and internal organisation prove it to belong to the falcon tribe. Its feet being incapable of grasping, it keeps constantly on the ground in sandy and open places, and runs with such speed as to be able to overtake the most agile reptiles. The destruction it causes in their ranks must be as great as its own enviable powers of digestion, for Le Vaillant mentions that having killed one of these birds he found in its crop eleven rather large lizards, three serpents of an arm's length, and eleven small tortoises, besides a number of locusts, beetles, and other insects, swallowed most likely by way of dessert.

\* A. Adams. 'Notes of the Natural History of the Islands of the Eastern Archipelago. Narrative of the Voyage of H.M.S. Samarang.'



OSTRICH CATCHING.

## CHAPTER XXIX.

### THE OSTRICH AND THE CASSOWARY.

Size of the Ostrich—Its astonishing Swiftmess—Ostrich Hunting—Stratagem of the Ostrich for protecting its Young—Points of Resemblance with the Camel—Its Voracity—Ostrich Feathers—Domestication of the Ostrich in Algeria—Poetical Legend of the Arabs—The American Rheas—The Cassowary—The Australian Emu.

**I**N the African plains and wildernesses, where the lion seeks his prey, where the pachyderms make the earth tremble under their weighty strides, where the giraffe plucks the high branches of the acacia, and the herds of the antelope bound along: there also dwells the Ostrich, the king of birds, if size alone gives right to so proud a title; for neither the condor nor the albatross can be compared in this respect to the ostrich, who raises his head seven or eight feet above the ground, and attains a weight of from two to three hundred pounds. His small and weak wings are incapable of carrying him through the air, but their flapping materially assists the action of his legs, and serves to increase his swiftmess when, flying over the plain, he ‘scorns the horse and its rider.’ His feet appear hardly to touch the ground, and the length between each stride

is not unfrequently from twelve to fourteen feet, so that for a time he might even outstrip a locomotive rushing along at full speed.

In Senegal, Adanson saw a couple of ostriches so tame that two negro boys could sit upon the largest of them. 'Scarce had he felt the weight,' says the venerable naturalist, 'when he began to run with all his might, and thus they rode upon him several times round the village. I was so much amused with the sight, that I wished to see it repeated; and in order to ascertain how far the strength of the birds would reach, I ordered two full-grown negroes to mount upon the smallest of them and two others upon the strongest. At first they ran in a short gallop with very small strides, but after a short time they extended their wings like sails, and scampered away with such an amazing velocity that they scarcely seemed to touch the ground. Whoever has seen a partridge run knows that no man is able to keep up with him, and were he able to make greater strides his rapidity would undoubtedly be still greater. The ostrich, who runs like a partridge, possesses this advantage, and I am convinced that these two birds would have distanced the best English horses. To be sure they would not have been able to run for so long a time, but in running a race to a moderate distance they would certainly have gained the prize.'

Not only by his speed is the ostrich able to baffle many an enemy, the strength of his legs also serves him as an excellent means of defence; and many a panther or wild dog coming within reach of his foot has had reason to repent of its temerity. But in spite of the rapidity of his flight, during which he frequently flings large stones backwards with his foot, and in spite of his strength, he is frequently obliged to succumb to man, who knows how to hunt him in various ways.

Unsuspicious of evil, a troop of ostriches wanders through the plain, the monotony of which is only relieved here and there by a clump of palms, a patch of candelabra-shaped tree-euphorbias, or a vast and solitary baobab. Some leisurely feed on the sprouts of the acacias, or the hard leaves of the mimosas, others agitate their wings and ventilate the delicate plumage, the possession of which is soon to prove so fatal to them. No other bird is seen in their company—for no other bird leads a life like theirs; but the zebra and the antelope are fond of

associating with the ostrich, desirous perhaps of benefiting by the sharpness of his eye, which is capable of discerning danger at the utmost verge of the horizon. But in spite of its vigilance, misfortunes are already gathering round the troop, for the Bedouin has spied them out, and encircles them with a ring of his fleetest coursers. In vain the ostrich seeks to escape. One rider drives him along to the next, the circle gradually grows narrower and narrower, and, finally, the exhausted bird sinks upon the ground, and receives the death-blow with stoical resignation.

To surprise the cautious seal the northern Eskimo puts on a skin of the animal, and imitating its motions mixes among the unsuspecting herd; and, in South Africa, we find the Bushman resort to a similar stratagem to outwit the ostrich. He forms a kind of saddle-shaped cushion, and covers it over with feathers, so as to resemble the bird. The head and neck of an ostrich are stuffed, and a small rod introduced. Preparing for the chase, he whitens his black legs with any substance he can procure, places the saddle on his shoulders, takes the bottom part of the neck in his right hand, and his bow and poisoned arrows in his left. Under this mask he mimics the ostrich to perfection, picks away at the verdure, turns his head as if keeping a sharp look out, shakes his feathers, now walks, and then trots, till he gets within bow-shot, and when the flock runs, from one receiving an arrow, he runs too. Sometimes, however, it happens that some wary old bird suspects the cheat, and endeavours to get near the intruder, who then tries to get out of the way, and to prevent the bird from catching his scent, which would at once break the spell.

The ostrich generally passes for a very stupid animal, yet to protect its young it has recourse to the same stratagems which we admire in the plover, the oyster-catcher,\* and several other strand-birds. Thus Professor Thunberg relates that riding past a place where a hen-ostrich sat on her nest, the bird sprang up and pursued him, in order to draw off his attention from her young ones or her eggs. Every time the traveller turned his horse toward her, she retreated ten or twelve paces, but as soon as he rode on, pursued him again.

\* 'The Sea and its Living Wonders,' p. 119.

The instinct of the ostrich in providing food for its young is no less remarkable, for it is now proved that this bird, far from leaving its eggs, like a cold-blooded reptile, to be vivified by the sun, as was formerly supposed, not only hatches them with the greatest care, but even reserves a certain portion of eggs to provide the young with nourishment when they first burst into life: a wonderful provision, when we consider how difficult it would be for the brood to find any other adequate food in its sterile haunts. In Senegal, where the heat is extreme, the ostrich, it is said, sits at night only upon those eggs which are to be rendered fertile, but in extratropical Africa, where the sun has less power, the mother remains constant in her attentions to the eggs both day and night.

The number of eggs which the ostrich usually sits upon is ten; but the Hottentots, who are very fond of them, upon discovering a nest, seize fitting opportunities to remove one or two at a time; this induces the bird to deposit more, and in this manner she has been known, like the domestic hen, to lay between forty and fifty in a season.

Almost as soon as the chicks of the ostrich (which are about the size of pullets) have escaped from the shell, they are able to walk about and to follow the mother, on whom they are dependent for a long time. And here again we find a wonderful provision of nature in providing the young of the ostrich with a colour and a covering admirably suited to the localities they frequent. The colour is a kind of pepper and salt, agreeing well with the sand and gravel of the plains, which they are in the habit of traversing, so that you have the greatest difficulty in discerning the chicks even when crouching under your very eyes. The covering is neither down nor feathers, but a kind of prickly stubble, which no doubt is an excellent protection against injury from the gravel and the stunted vegetation amongst which they dwell.

The ostrich resembles in many respects the quadrupeds, and particularly the camel, so that it may almost be said to fill up the chasm which separates the mammalia from the birds, and to form a connecting link between them. Both the ostrich and the dromedary have warty excrescences on the breast upon which they lean whilst reposing, an almost similarly formed foot, the same muscular neck; and when we consider that they both

feed upon the most stunted herbage, and are capable of supporting thirst for an incredibly long time, being, in fact, both equally well formed for living on the arid plains, it is certainly not to be wondered at that the ancients gave the ostrich a name betokening this similitude (*Struthio camelus*), and that the fancy of the Arabs ascribes its original parentage to a bird and to a dromedary.

It is difficult to ascertain what the tastes of the ostrich may be while roaming the desert, but when in captivity no other bird or animal shows less nicety in the choice of its food, as it swallows with avidity stones, pieces of wood and iron, spoons, knives, and other articles of equally *light* digestion that may be presented to it. 'Nothing,' says Methuen, speaking of a domesticated ostrich, 'disturbed its digestion—dyspepsia (happy thing) was undreamt of in its philosophy. One day a Muscovy-duck brought a promising race of ducklings into the world, and with maternal pride conducted them forth into the yard. Up with solemn and measured stride walked the ostrich, and, wearing the most mild and benignant cast of face, swallowed them all, one after the other, like so many oysters, regarding the indignant hissings and bristling plumage of the hapless mother with stoical indifference.'

The costly white plumes of the ostrich, which are chiefly obtained from the wings, have been prized in all ages for the elegance of their long, waving, loose, and flexible barbs. From seventy to ninety feathers go to the pound; but a single bird seldom furnishes more than a dozen, as many of them are spoilt by trailing or some other accident. The vagrant tribes of the Sahara sell their ostrich plumes to the caravans which annually cross the desert, and convey them to the ports of the Mediterranean. Here they were purchased as far back as the twelfth or thirteenth century, by the Pisanese or Genoese merchants, through whose agency they ultimately crossed the Alps to decorate the stately *Burggräfinnen* of the Rhine, or the wives of the opulent traders of Augsburg or Nuremberg. At a still more remote period the Phœnicians brought ostrich-feathers from Ophir to Tyre, whence they were distributed among the princes of the Eastern world.

In Algeria, the ostrich is often domesticated, particularly on account of its eggs, which weigh three pounds, and are equiva-

lent to twenty-four of the common fowl's eggs. According to Andersson they afford an excellent repast; while Dr. Livingstone tells us they have a strong disagreeable flavour, which only the keen appetite of the desert can reconcile one to. The flesh of the ostrich is decidedly coarse, but as there is no accounting for tastes, the Romans seem to have prized it; and Firmus, one of their pseudo-emperors, most likely desirous of emulating the gormandising powers of the bird on which he fed, is said to have devoured a whole ostrich at *one* meal.

A legend of the Arabs gives the following poetical account of the origin of the crippled wings and ruffled coat of the ostrich. 'About a thousand years ago,' say the wandering tribes of Kordofan, 'the ostrich still resembled the Hubahra or Arabian bustard, and both together inhabited the grassy plains. Then also he flew remarkably well, nor was he so shy as at present, when he avoids the approach of man with gigantic strides, but lived in friendship and confidence both with him and the other animals of the desert. One day the Hubahra thus addressed him: "Dear brother! if thou art inclined we will, *inschalla!* (with God's permission) fly to-morrow to the river, bathe, drink, and then return to our young!" "Well," replied the ostrich; "we will do so:" but he did not add—"inschalla!" for he was arrogant, and did not bow before the might of the all-merciful and eternal God, "whose praise the angels in heaven proclaim, and whose glory the thunder in the clouds celebrates,"\* as hitherto he only had known His inexhaustible goodness, and prided himself upon his own strength and his strong wings. On the following morning they prepared for their journey, but the Hubahra before starting said, "Be *issm lillahi!*" (in the name of Allah) while the ostrich remained mute, and then they both flew towards the eye of God (the sun). And the ostrich rose higher and higher, and striking the air with his mighty wings left the Hubahra far behind. His heart was full of arrogance; he forgot the blessings of Him who is the fountain of all blessings, and relied only upon himself. But the measure of God's mercy was filled to overflowing, and the anger of Allah was roused against the offender. Higher and higher he rose, as if he wanted to reach the sun. But now the avenging angel

\* Words of the 'Koran.'

of the Lord approached, and withdrew the veil which separated him from the flaming orb. In an instant his wings were burnt, and he fell miserably down upon the earth. Even now he cannot fly; even now thou seest his singed feathers; even now he fears God's vengeance, and endeavours to escape it with gigantic strides. Therefore, O man! let the bird of the desert serve thee as a warning example: humble thyself before the power of the Almighty, and never undertake anything without saying beforehand "inschalla!" that the blessing of God may attend thy work.' There is evidently a great resemblance between this legend and the story of Icarus, but the Arab tale gives an excellent moral lesson, and is imbued with a deep religious feeling, of which we find no traces in the Greek.

The *Rheas*, from their size and similar habits, have been styled the ostriches of the New World, though differing in many essential characters. One species, the *Rhea Darwinii*, inhabits Patagonia, while the Emu or Nandu (*Rhea Americana*) is found throughout the whole eastern part of South America, from Buenos Ayres to the Orinoco, wherever open plains or savannas invite it to take up its residence. The nandu is not near so tall as the true ostrich, scarcely rising above four feet, and is of a uniform grey colour except on the back, which has a brown tint. The back and rump are furnished with long feathers, but not of the same rich and costly kind as those which adorn the African ostrich. Its feeble wings merely serve to accelerate its flight, serving it as oars or sails, particularly when running with the wind. 'It is not easily caught,' says the Prince of Neu Wied, 'as it not only runs very fast, but in zigzag lines, so that the horse, rendered giddy by so many evolutions, at length drops down with its rider.'

The Indian Archipelago and New Holland have likewise their peculiar struthionidous birds.

The Galeated Cassowary (*Casuaris galeatus*), thus called from its head being surmounted by a kind of horny helmet, is a native of Java and the adjacent isles. The skin of the head and upper part of the neck is naked, of a deep blue and fiery red tint, with pendant caruncles similar to those of the turkey-cock. It is much inferior in size to the ostrich, and its wings are reduced to so rudimentary a state, consisting merely of five long bristles, without any plumes, that they are even unable to

assist it in running. It is, however, very swift, and striking out alternately with one of its robust and powerful legs, projects its body violently forward with a bounding motion far surpassing the speed of the horse.



CASSOWARY.



EMU.

The Australian Emu (*Dromaius Novæ Hollandiæ*) is allied to the cassowary, though differing in many external characters. Both the helmet, and the long pens or quills observable in the wings of the latter, are here wanting; its neck and legs are longer, its feathers, for the most part grey and brown mixed, are not so filiform, and its beak also is differently shaped. In size it more nearly approaches the ostrich, rising to a height of seven feet, and from its great muscular power is able to run so quickly as to distance the swiftest greyhound. Incessant persecutions have driven it far away from the colonised parts of the country; but it has still a vast range in the wilds of the interior. It lives on fruits, eggs, and even small animals, which it swallows entire.



PARROTS.

## CHAPTER XXX.

### PARROTS.

Their Peculiar Manner of Climbing—Points of Resemblance with Monkeys—Their Social Habits—Their Connubial Felicity—Inseparables—Talent for Mimicry—Wonderful Powers of Speech and Memory—Their Wide Range within the Temperate Zones—Colour of Parrots Artificially Changed by the South American Indians—The Cockatoos—Cockatoo Killing in Australia—The Macaw—The Parakeets.

**T**HE parrots have so many points of resemblance with the monkeys in their tastes and habits, that, notwithstanding their different appearance, one might almost be tempted to call them near relations. A constant restlessness is peculiar to both. Most animals love repose after meals, but not so the monkeys and the parrots, who, contrary to the general rule, only remain quiet while they are eating. At other times the former are always in motion, chattering or screaming, hanging

from the boughs, or swinging to and fro like rope dancers, or jumping from branch to branch, or climbing to the top of the highest trees; and the parrots behave exactly in the same manner. They also are constantly screaming, flying or climbing about, when not eating a banana or cracking a nut; they also are particularly noisy before going to sleep.

As the monkey seldom or never sets his foot on even ground, but climbs or springs from branch to branch, thus also the parrot will rarely be seen walking; his flight is rapid, but generally only of short duration, so that evidently neither the ground nor the air were destined for his habitual abode. In climbing, however, he shows an uncommon expertness and agility, unlike that of any other quadruped or bird, as the organ he chiefly uses for the purpose is his beak. He first seizes with his powerful mandibles the branch he intends to ascend, and then raises his body one foot after the other; or if he happens to have a sweet nut in his bill which he is anxious to preserve, he presses his lower mandible firmly upon the branch, and raises himself by the contraction of the muscles of his neck. On descending, he first bends his head, lays the back of his beak upon the branch, and while the extended neck supports the weight of the body, brings down one foot after the other. While accidentally walking on even ground, he also frequently uses his upper mandible as a kind of crutch, by fixing its point or its back upon the ground; for the formation of his toes is such, that he can walk but very slowly, and consequently requires the aid of that singular support. Thus monkeys and parrots are, in the fullest sense of the word, dendritic animals—the free children of the primeval forest. But if the toes of the parrot are but ill adapted for walking, they render him valuable services in grasping his food. They even form a kind of hand, with which he conveys the morsel to his beak. This easily cracks the hardest nutshell, after which the broad and fleshy tongue adroitly extracts the kernel.

In his free state the parrot lives only upon nuts and seeds; when captive, however, he becomes omnivorous, like man his master, eats bread and meat, sugar and pastry, and is very fond of wine, which has a most exhilarating effect on his spirits.

Like most monkeys, the parrots are extremely social. At break of day they generally rise in large bands, and with loud

screams fly away to seek their breakfast. After having feasted together, they retire to the shady parts of the forest as soon as the heat begins to be oppressive, and a few hours before the setting of the sun reappear in large troops.

If the monkeys are distinguished by a strong affection for their young, the parrots may be cited as models of connubial love, for when once a pair has been united, its attachment remains unaltered unto death. Far more than the turtle-dove, the little passerine parrot of Brazil, and the love-parrot of Guinea, deserved to be celebrated by poets as patterns of conjugal affection. Never seen but in each other's company, each delights to imitate the actions of the other; and when one dies, the other soon follows its partner. A gentleman who had lost one of a pair of these inseparables, attempted to preserve the other by hanging up a looking-glass in its cage. At first the joy of the poor bird was boundless, as he fancied his mate restored to his caresses; but soon perceiving the deception, he pined away and died.

Another point of resemblance between the parrots and monkeys is their talent for mimicry; but while the latter, favoured by the similarity of their organisation to that of man, strive to copy his gestures and actions; the former endeavour to imitate his voice and to repeat his words, an attempt facilitated by the extreme mobility of their tongue and upper mandible, no less than by the peculiar construction of their larynx or windpipe. These imitative instincts appear the more remarkable when we consider that both monkeys and parrots have no pursuits that necessarily bring them into closer connection with man. They are comparatively useless to him, live at a distance from his haunts, in the depths of the forests, and are so far from seeking his company, that they retreat as fast as they can on seeing him approach. How comes it, then, that they have been gifted with their wonderful ability to imitate his language and his actions, and of what use is it to them or to us?

The talent of speech has not been given to all parrots alike. The beautiful American aras, for instance, are in this respect remarkably stupid, while the purple lory of the East Indies, and the grey African parrot (*Psittacus erithacus*), are remarkable for their linguistic attainments. It is well known that they are often able to retain whole songs and sentences;

and to repeat them with astonishing exactness. Buffon mentions a parrot who, having been taught to speak during the passage by an old sailor, had so completely adopted his gruff voice as to be mistaken for the weather-beaten tarpaulin himself. Although the bird was afterwards presented to a young lady, and no more heard the voice of its first instructor, it did not forget his lessons, and nothing could be more ludicrous than to hear it suddenly pass from the sweet tones of its fair mistress to the rough accents of its first teacher.

The grey parrot not only imitates the voice of man, but has also a strong desire to do so, which he manifests by his attention in listening, and by the continuous efforts he makes to repeat the phrases he has heard. He seems to impose upon himself a daily task, which even occupies him during sleep, as he speaks in his dreams. His memory is astonishing, so that a cardinal once gave a hundred gold crowns for one of these birds that correctly repeated a long prayer; and M. de la Borde told Buffon he had seen one that was fully able to perform the duties of a ship's chaplain.

All parrots are more or less susceptible of education, and, particularly when caught young, grow very much attached to the master that feeds them. Those that are sent to Europe are generally taken from the nest, and have thus never experienced the sweets of freedom; but they are also frequently caught full grown. The American Indians know how to strike them with small arrows, whose points are blunted with cotton, so as to stun without killing them; or else, under the trees on which they perch, they light a fire of strong-smelling weeds, whose vapours cause them to drop to the ground. These captives are frequently extremely stubborn; but blowing the fumes of tobacco into their face until they fall asleep is an infallible remedy to cure them of their obstinacy, this operation being so little to their taste that it need hardly ever be repeated twice.

Although pre-eminently tropical, like the colibris, several parrots range far within the temperate zone, as they are found in the Southern hemisphere at the Straits of Magellan and on the Macquarie Islands, and in the Northern, in the neighbourhood of Cairo and in Kentucky, where the Carolina parrot is often seen in great numbers during the summer.

The parrots are subdivided into numerous groups and species, chiefly according to the various forms of their bills and tails. The short-tailed parrots of the Old World mostly display bright or gaudy colours, such as the Lories, which owe their name to the frequency with which they repeat this word, while the American species are generally green. The Indians have, however, found out an ingenious method to adorn the plumage of the Amazonian parrot (*Psittacus Amazonicus*), which is in great request, from its being easily tamed, and learning to speak with facility. They take a young bird from its nest, pluck the feathers from its back and shoulders, and then rub the naked parts with the blood of a small species of frog. The feathers which grow again after this operation are no longer green, but yellow, or of a bright red colour. Many birds die in consequence of being plucked, and thus these metamorphosed parrots are extremely rare, notwithstanding the high prices which the savages obtain for them.

The Cockatoos are distinguished from the other parrots by a crest of elegant feathers, which they can raise and depress at pleasure. They inhabit the East Indies and Australia, and have generally a white or roseate plumage. Their chief resorts are dense and humid forests, and they frequently cause great devastations in the rice plantations, often pouncing to the number of six or eight hundred upon a single field, and destroying even more than they devour.

The great white cockatoo (*Cacatua Cristata*), who is able to raise his beautiful yellow crest five inches high, as a cock does his comb, is the species most frequently seen in Europe. This bird is half-domesticated in several parts of India, as it builds its nest under the roofs of houses, and this tameness results from its intelligence, which seems superior to that of other parrots.

As Australia, the land of anomalies in natural history, possesses a black swan, it also gives birth to a splendid black cockatoo (*Cacatua Banksii*), the finest and rarest of the whole genus. Captain Grey gives us an animated description of the chasing of this bird. 'Perhaps the finest sight that can be seen, in the whole circle of native sports, is the killing cockatoos with the kiley or boomerang. A native perceives a large flight of cockatoos in a forest which encircles a lagoon: the

expanse of water affords an open clear space above it, unencumbered with trees, but which raise their gigantic forms all around, more vigorous in their growth from the damp soil in which they flourish; and in their leafy summits sit a boundless number of cockatoos, screaming, and flying from tree to tree, as they make their arrangements for a night's sound sleep. The native throws aside his cloak, so that he may not even have this slight covering to impede his motions, draws his kiley from his belt, and with a noiseless, elastic step, approaches the lagoon, creeping from tree to tree, from bush to bush, and disturbing the birds as little as possible. Their sentinels, however, take the alarm; the cockatoos farthest from the water fly to the trees near its edge, and thus they keep concentrating their forces as the native advances; they are aware that danger is at hand, but are ignorant of its nature. At length the pursuer almost reaches the edge of the water, and the scared cockatoos with wild cries spring into the air; at the same instant the native raises his right hand high over his shoulder, and bounding forwards with his utmost speed for a few paces to give impetus to his blow, the kiley quits his hand as if it would strike the water, but when it has almost touched the unruffled surface of the lake, it spins upwards with inconceivable velocity, and with the strangest contortions. In vain the terrified cockatoos strive to avoid it; it sweeps wildly and uncertainly through the air (and so eccentric are its motions, that it requires but a slight stretch of the imagination to fancy it endowed with life), and with fell swoops is in rapid pursuit of the devoted birds, some of whom are almost certain to be brought screaming to the earth. But the wily savage has not yet done with them; he avails himself of the extraordinary attachment which these birds have for one another, and fastening a wounded one to a tree, so that its cries may induce its companions to return, he watches his opportunity, by throwing his kiley or spear, to add another bird or two to the booty he has already obtained.

The magnificent Macaws, or Aras, of South America are distinguished by having their cheeks destitute of feathers, and their tail feathers long. Their size and splendid plumage render them fit ornaments of princely gardens, but their loud and piercing screams would prove a great annoyance to the

inmates of humbler dwellings. 'Superior in size and beauty to every parrot of South America,' says Waterton, 'the ara (*Macrocerus Macao*) will force you to take your eyes from the rest of animated nature, and gaze at him: his commanding strength; the flaming scarlet of his body; the lovely variety of red, yellow, blue, and green in his wings; the extraordinary length of his scarlet and blue tail, seem all to form and demand for him the title of emperor of all the parrots. He is scarce in Demerara, till you reach the confines of the Macoushi country; there he is in vast abundance: he mostly feeds on trees of the palm species. When the concourites have ripe fruit on them, they are covered with this magnificent parrot: he is not shy or wary; you may take your blowpipe and quiver of poisoned arrows and kill more than you are able to carry back to your hut. They are very vociferous, and, like the common parrots, rise up in bodies towards sunset, and fly two and two to their place of rest. It is a grand sight in ornithology to see thousands of aras flying over your head, low enough to let you have a full view of their flaming mantle.'

The Paroquets, or Parakeets, are smaller than the common parrots, and have longer tails. There are numerous species, some distinguished by a very long pointed tail, and collar-like mark round the neck, which inhabit the Asiatic continent and islands; and others, natives of Australia, which are distinguished by their colour being gorgeously variegated and peculiarly mottled on the back, by their tail feathers not being pointed, and by their being furnished with elongated tarsi adapted for running on the ground.

To the former belongs the beautiful ring paroquet, which is supposed to have been the first bird of the parrot kind known to the ancient Greeks, having been brought from the island of Ceylon, after the Indian expeditions of Alexander the Great; to the latter, the elegant green parakeet, which in the hot seasons congregates about the pools in almost incredible numbers. Though capable of a rapid and even flight, and frequently at great altitudes, it is generally found running over the ground, and treading its way among the grasses to feed on the seeds. It can easily be domesticated, and a more elegant or beautiful pet can scarcely be conceived.



CARAVAN.

## CHAPTER XXXI.

### TROPICAL RUMINANTS AND EQUIDÆ.

The Camel—Its Paramount Importance in the great Tropical Sandwastes—Its Organisation admirably adapted to its mode of Life—Beauty of the Giraffe—Its Wide Range of Vision—Pleasures of Giraffe Hunting—The Antelopes—The Springbok—The Reedbok—The Duiker—The Aurochs—The Gemsbok—The Klippspringer—The Koodoo—The Gnu—The Indian Antelope—The Nylghau—The Caffrarian Buffalo—The Indian Buffalo and the Tiger—Dr. Livingstone's Escape from a solitary Buffalo—Swimming Feats of the Bhain—The Zebra—The Quagga—The Douw.

**T**HERE is a sea without water and refreshing breezes, without ebb and flood, without fishes and algæ! And there is a ship which safely travels from one shore to the other of that sea, a ship without sails or masts, without keel or rudder, without screw or paddle, without cabin or deck!

This ship, so swift and sure, is the Dromedary, and that sea is the desert; which none but he, or what he carries, can pass.

In many respects the vast sandy deserts of Africa and Asia remind one of the ocean. There is the same boundless horizon, the same unstable surface, now rising, now falling with the play of the winds; the same majestic monotony, the same optical illusions, for as the thirsty mariner sees phantom palm-groves rise from the ocean, thus also the sandwaste transforms itself, before the panting caravan, into the semblance of a refreshing lake. Here we see islands, verdant oases of the sea—there, oases,

green islands of the desert; here, sand billows—there, water waves, separating widely different worlds of plants and animals; here, the ship, the camel of the ocean—there, the dromedary, the ship of the desert!

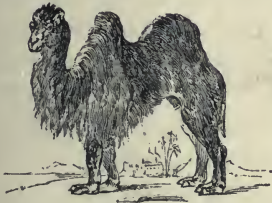
But for this invaluable animal, the desert itself would ever have remained impassable and unknown to man. On it alone depends the existence of the nomadic tribes of the Orient, the whole commercial intercourse of North Africa and South-west Asia; and no wonder that the Bedouin prizes it, along with the fruit-teeming date-palm, as the most precious gift of Allah. Other animals have been formed for the forest, the water, the savannah; to be the guide, the carrier, the companion, the purveyor of all man's wants in the desert, is the camel's destiny.

Wonderfully has he been shaped for this peculiar life, formed to endure privations and fatigues under which all but he would sink. On examining the camel's foot, it will at once be seen how well it is adapted for walking on a loose soil, as the full length of its two toes is provided with a broad, expanded, and elastic sole. Thus the camel treads securely and lightly over the unstable sands, while he would either slip or sink on a muddy ground. He can support hunger longer than any other mammiferous animal, and is satisfied with the meanest food. Frugal, like his lord the wiry Bedouin, the grinding power of his teeth and his cartilaginous palate enable him to derive nutriment from the coarsest shrubs, from thorny mimosas and acacias, or even from the stony date-kernels, which his master throws to him after having eaten the sweet flesh in which they are imbedded.

For many days he can subsist without drinking, as the pouch-like cavities of his stomach—a peculiarity which distinguishes him from all other quadrupeds, perhaps, with the sole exception of the elephant—form a natural cistern or reservoir, whose contents can be forced upwards by muscular contraction, to meet the exigencies of the journey. It is frequently believed that this liquid remains constantly limpid and palatable, and that in cases of extreme necessity camels are slaughtered to preserve the lives of the thirsty caravan; but Burckhardt never heard of the Arabs resorting to this expedient, nor did he think it likely they would do so, as their own destruction must be in-

volved in that of the beast on which they rode, and the lukewarm liquid thus obtained, besides affording a very poor supply, would be sufficiently nauseous to make even a Tantalus turn away disgusted.

But the 'ship of the desert' is not only provided with water for the voyage, but also with liberal stores of fat, which are chiefly accumulated in the hump; so that this prominence, which gives it so deformed an appearance, is in reality of the highest utility—for should food be scarce, and this is almost always the case while journeying through the desert, internal absorption makes up in some measure for the deficiency, and enables the famished camel to brave for some time longer the fatigues of the naked waste. This is so well known to the Bedouin that the first thing he examines about his camel when preparing for a long journey is the hump: should he find it large he knows that the animal will endure considerable fatigue



BACTRIAN CAMEL.



DROMEDARY.

even with a very moderate allowance of food, for he believes in the proverb that the 'camel can subsist for an expedition on the fat of its own hump.' Yet all mortal endurance has its limits, and even the camel, though so well provided against hunger and thirst, must frequently succumb to the excess of his privations, and the bleached skeletons of the much-enduring animal strewed along the road mark at once the path of the caravan and the dreadful sufferings of a desert-journey.

While the Bactrian Camel with a double hump ranges from Turkestan to China, the single-hump camel or dromedary, originally Arabian, has spread in opposite directions towards the East Indies, the Mediterranean, and the Niger, and is used in Syria, Egypt, Persia, and Barbary, as the commonest beast of burden. It serves the robber, but it serves also the peaceful merchant, or the pilgrim, as he wanders to Mecca to perform his devotions at the prophet's tomb. In long array, winding

like a snake, the caravan traverses the desert. Each dromedary is loaded, according to its strength, with from six hundred to a thousand pounds, and knows so well the limits of its endurance, that it suffers no overweight, and will not stir before it be removed. Thus, with slow and measured pace, the caravan proceeds at the rate of ten or twelve leagues a day, often requiring many a week before attaining the end of its journey.

When we consider the deformity of the camel, we cannot doubt that its nature has suffered considerable changes from the thralldom and unceasing labours of more than one millennium. Its servitude is of older date, more complete, and more irksome, than that of any other domestic animal—of older date, as it inhabits the countries which history points out to us as the cradle of mankind; more complete, as all other domestic animals still have their wild types roaming about in unrestrained liberty, while the whole camel race is doomed to slavery; more irksome, finally, as it is never kept for luxury or state like so many horses, or for the table like the ox, the pig, or the sheep, but is merely used as a beast of transport, which its master does not even give himself the trouble to attach to a cart, but whose body is loaded like a living waggon, and frequently even remains burdened during sleep.

Thus, the camel bears all the marks of serfdom. Large naked callosities of horny hardness cover the lower part of the breast and the joints of the legs, and although they are never wanting, yet they themselves give proof that they are not natural, but that they have been produced by an excess of misery and ill-treatment, as they are frequently found filled with a purulent matter.

The back of the camel is still more deformed by its single or double hump than its breast or legs by their callosities; and as the latter are evidently owing to the position in which the heavily burthened beast is forced to rest, it may justly be inferred that the hump also, which merely consists of an accumulation of fat, did not belong to the primitive animal, but has been produced by the pressure of its load. Even its evident use as a store-house for a desert journey may have contributed to its development, as Nature is ever ready to protect its creatures, and to modify their forms according to circumstances; and thus, what at first was a mere casual occurrence,

became at length, through successive generations, the badge and heir-loom of the whole race.

Even the stomach may, in the course of many centuries, have gradually provided itself with its water-cistern, since the animal, after a long and tormenting privation, whenever an opportunity of satisfying its thirst occurred, distended the coats of that organ by immoderate draughts, and thus, by degrees, gave rise to its pouch-like cavities.

The hardships of long servitude, which have thus gradually deformed the originally, perhaps, not ungraceful camel, have no doubt also soured its temper, and rendered its character as unamiable as its appearance is repulsive. 'It is an abominably ugly necessary animal,' says Mr. Russell, in a letter dated from the camp of Lucknow; 'ungainly, morose, quarrelsome, with tee-totalling propensities; unaccountably capricious in its friendships and enmities; delighting to produce with its throat, its jaws, its tongue, and its stomach, the most abominable grunts and growls. Stupidly bowing to the yoke, it willingly submits to the most atrocious cruelties, and bites innocent, well-meaning persons, ready to take its part. When its leader tears its nostril, it will do no more than grunt; but ten against one it will spit at you if you offer it a piece of bread. For days it will march along, its nose close to the tail of the beast that precedes it, without ever making the least attempt to break from the chain; and yet it will snort furiously at the poor European who amicably pats its ragged hide.'

The camel seems to have been rather harshly dealt with in this description; at any rate, it may plead for its excuse that it would be too much to expect a mild and amiable temper in a toil-worn slave.

Which of all four-footed animals raises its head to the most towering height? Is it the colossal elephant, or the 'ship of the desert'? No doubt the former reaches many a lofty branch with its flexible proboscis, and the eye of the long-necked camel sweeps over a vast extent of desert; but the Giraffe embraces a still wider horizon, and plucks the leaves of the *mokaala* at a still greater height. A strange and most surprising animal, almost all neck and leg, seventeen feet high against a length of only seven from the breast to the beginning of the tail, its comparatively small and slanting body resting

on long stilts, its diminutive head fixed at the summit of a column; and yet, in spite of these disproportions, of so elegant and pleasing an appearance, that it owes its Arabic name, *Xirapha*, to the graceful ease of its movements.

The beauty of the giraffe is enhanced by its magnificently spotted skin, and by its soft and gentle eyes, which eclipse even those of the gazelle, and, by their lateral projection, take in a wider range of the horizon than is subject to the vision of any other quadruped, so as even to be able to anticipate a threatened attack in the rear from the stealthy lion or any other foe of the desert.



GIRAFFES AND ZEBRAS.

The long tail, adorned with a bushy tuft of flowing black hair, no doubt renders it good service against many a stinging insect; and the straight horns, or rather excrescences of the frontal bone, small as they are, and muffled with skin and hair, are by no means the insignificant weapons they have been supposed to be. 'We have seen them wielded by the males against each other with fearful and reckless force,' says Maunder, in his excellent 'Dictionary of Animated Nature,' 'and we know that they are the natural arms of the giraffe most dreaded by the keeper of the present living giraffes in the Zoological Gardens, because they are most commonly and suddenly put in use. The giraffe does not butt by depressing and suddenly elevating the head, like the deer, ox, or sheep, but strikes the callous obtuse extremity of the horns against

the object of his attack with a sidelong sweep of the neck. One blow thus directed at full swing against the head of an unlucky attendant would be fatal.'

The projecting upper lip of the giraffe is remarkably flexible, and its elongated prehensile tongue, performing in miniature the part of the elephant's proboscis, is of material assistance in browsing upon the foliage and young shoots of the prickly acacia, which constitute the animal's chief food.

With feet terminating in a divided hoof, and a ruminant like our ox, the giraffe has four stomachs, and an enormous intestinal length of 288 feet, a formation which bears testimony to the vast and prolonged powers of digestion necessary to extract nutrition from its hard and meagre diet.

Ranging throughout the wide plains of Central Africa from Caffraria to Nubia, the giraffe, though a gregarious animal, generally roams about only in small herds, averaging sixteen in number, from the young animal of nine or ten feet in height, to the dark chestnut-coloured old male, towering to a height of upwards of eighteen feet. Notwithstanding the rapidity with which it strides along, the fore and hind leg on the same side moving together, instead of diagonally as in most other quadrupeds, yet a full gallop quite dissipates its strength; and the hunters, being aware of this, always try to press the giraffes at once to it, knowing that they have but a short space to run before the animals are in their power. In doing this the old sportsmen are careful not to go too close to the giraffe's tail; 'for this animal,' says Dr. Livingstone, 'can swing his hind foot round in a way which would leave little to choose between a kick with it and a clap from the arm of a windmill.'

Captain Harris, in his 'Wild Sports of Africa,' gives us an animated picture of a giraffe hunt, breathing the full life and excitement of the chase.

'Many days had now elapsed since we had even seen the camelopard, and then only in small numbers, and under the most unfavourable circumstances. The blood coursed through my veins like quicksilver therefore as, on the morning of the 19th, from the back of Breslar, my most trusty steed, with a firm-wooded plain before me, I counted thirty-two of these animals industriously stretching their peacock-necks to crop

the tiny leaves which fluttered above their heads in a mimosa grove that beautified the scenery. They were within a hundred yards of me; but having previously determined to try the *boarding* system, I reserved my fire.

‘Although I had taken the field expressly to look for giraffes, and had put four of the Hottentots on horseback, all excepting Piet had as usual slipped off unperceived in pursuit of a troop of *koodoos*. Our stealthy approach was soon opposed by an ill-tempered rhinoceros, which, with her ugly calf, stood directly in the path, and the twinkling of her bright little eyes, accompanied by a restless rolling of the body, giving earnest of her intention to charge. I directed Piet to salute her with a broadside, at the same moment putting spurs to my horse. At the report of the gun, and the sudden clattering of hoofs, away bounded the giraffes in grotesque confusion, clearing the ground by a succession of frog-like hops, and soon leaving me far in the rear. Twice were their towering forms concealed from view by a park of trees, which we entered almost at the same instant, and twice, in emerging from the labyrinth, did I perceive them tilting over an eminence immeasurably in advance. A white turban that I wore round my hunting cap, being dragged off by a projecting bough, was instantly charged by three rhinoceroses, and, looking over my shoulder, I could see them long afterwards, fagging themselves to overtake me. In the course of five minutes the fugitives arrived at a small river, the treacherous sands of which receiving their long legs, their flight was greatly retarded; and after floundering to the opposite side, and scrambling to the top of the bank, I perceived that their race was run. Patting the steaming neck of my good steed, I urged him again to his utmost, and instantly found myself by the side of the herd. The stately bull being readily distinguishable from the rest by his dark chestnut robe and superior stature, I applied the muzzle of my rifle behind his dappled shoulder with the right hand, and drew both triggers; but he still continued to shuffle along, and being afraid of losing him, should I dismount, among the extensive mimosa groves with which the landscape was now obscured, I sat in my saddle, loading and firing behind the elbow, and then, placing myself across his path, until the tears trickling from his full brilliant eye, his lofty frame began to totter, and at the seventeenth discharge from the deadly-

grooved bore, like a falling minaret bowing his graceful head from the skies, his proud form was prostrate in the dust. Never shall I forget the tingling excitement of that moment. At last then, the summit of my hunting ambition was actually attained, and the towering giraffe laid low. Tossing my turbanless cap into the air, alone in the wild wood, I hurraed with bursting exultation, and, unsaddling my steed, sank exhausted beside the noble prize I had won.'

In a similar strain of triumph Gordon Cumming describes his first giraffe hunt: 'Galloping round a thick bushy tree under cover of which I had ridden, I suddenly beheld a sight the most astounding that a sportsman's eye can encounter. Before me stood a troop of ten colossal giraffes, the majority of which were from seventeen to eighteen feet high. On beholding me they at once made off, twisting their long tails over their backs, making a loud switching noise with them, and cantering along at an easy pace, which, however, obliged my horse to put his best foot foremost to keep up with them. The sensations which I felt on this occasion were different from anything that I had before experienced during a long sporting career. My senses were so absorbed by the wondrous and beautiful sight before me, that I rode along like one entranced. At every stride I gained upon the giraffes, and after a short burst at a swinging gallop, I was in the middle of them, and turned the finest cow out of the herd. On finding herself driven from her comrades and hotly pursued, she increased her pace and cantered along with tremendous strides, clearing an amazing extent of ground at every bound, while her neck and breast coming in contact with the dead old branches of the trees were continually strewing them in my path. In a few minutes I was riding within five yards of her stern, and firing at the gallop I sent a bullet into her back. Increasing my pace, I next rode alongside, and placing the muzzle of my rifle within a few feet of her, I fired my second shot behind the shoulder; the ball, however, seemed to have little effect. Once more I brought her to a stand, and dismounted from my horse. There we stood together alone in the wild wood. I gazed in wonder at her extreme beauty, while her soft dark eye, with its silky fringe, looked down imploringly at me, and I really felt a pang of sorrow in this moment of triumph for the blood I was shedding.

Pointing my rifle towards the skies, I sent a bullet through her neck. On receiving it she reared high on her hind legs and fell backwards with a heavy crash making the earth shake around her. A thick stream of dark blood spouted out from the wound, her colossal limbs quivered for a moment and she expired. No pen nor words can convey to a sportsman what it is to ride in the midst of a troop of gigantic giraffes—it must be experienced to be understood. They emitted a powerful perfume, which in the chase came hot in my face, reminding me of the smell of a hive of heather honey in September.’

After man, the giraffe’s chief enemy is the lion, who often waits for it in the thick brakes on the margin of the rivers or pools, and darts upon it with a murderous spring while it is slaking its thirst. Andersson once saw five lions, two of whom were in the act of pulling down a splendid giraffe, while the other three were watching close at hand the issue of the deadly strife; and Captain Harris relates that, while he was encamped on the banks of a small stream, a camelopard was killed by a lion whilst in the act of drinking, at no great distance from the waggons. It was a noisy affair; but an inspection of the scene on which it occurred proved that the giant strength of the victim had been paralysed in an instant.

Sometimes the giraffe saves itself from the attacks of its arch-enemy by a timely flight; but when hemmed in, it offers a desperate resistance, and in spite of its naturally gentle and peaceable disposition, gives such desperate kicks with its fore-feet as to keep its antagonist at a respectful distance, and finally to compel him to retreat.

• There are many analogies between the giraffe and the ostrich; both long-legged, long-necked, fit for cropping the tall mimosas, or scouring rapidly the plain; both, finally, defending themselves by striking their feet forwards, the one against the jackal or hyæna, the other against the assaults of the formidable lion.

The great peculiarity of the zoology of South Africa is the predominance of antelopes. Here no species of deer, roe, stag, or elk greets the eyes of the sportsman: their place in nature is taken by these hollow-horned ruminants, which have been created in an unusual number and variety of specific forms, constituting a series that fills up the wide hiatus between the goat and the ox. As the traveller advances from the Cape

towards the Sahara, he constantly falls in with new antelopes, and many unknown to the naturalist no doubt still roam in the undiscovered interior of the continent.

With the exception of the ox or cow-like species, such as the Eland, whose clumsier proportions and heavier gait remind one of our domestic cattle, the antelopes generally resemble the deer tribe by their elegant forms, their restless and timid disposition, and their proverbial swiftness. Their horns, whatever shape they assume, are round and annulated; in some species straight, in others curved and spiral; in some the females have no horns, in others they are common to both sexes. They all possess a most delicate sense of smell, and their eyes are proverbially bright and beaming. Their skin generally emits a delicious odour of the grass and wild herbs on which they feed, and some have between their hoofs a gland from which issues a secretion of an agreeable perfume.

Africa appears to be their great nursery, but many kinds are natives of Asia, while Europe has but two species,—the well-known Chamois of the Alps and the Saiga of the Russian steppes,—and the New World only one.

Few of the numerous African antelopes are more entitled to our notice than the graceful Springbok (*A. enchora*), which has earned its name from the surprising and almost perpendicular leaps it makes when started. It bounds to the height of ten or twelve feet with the elasticity of an India-rubber ball, clearing at each spring from twelve to



SPRINGBOK.

fifteen feet of ground, without apparently the slightest exertion. In performing this astonishing leap it appears for an instant as if suspended in the air, when down come all four feet again together, and striking the plain, away it soars again, as if about to take flight.

From the vast wilds in the interior of South Africa, when a prolonged drought has exhausted the last pools or watercourses, the springboks migrate in such incredible multitudes towards the fertile cultivated districts, that they have been well compared to the swarms of locusts. Like them, they consume every

green thing in their course, and ruin in a single night the fruits of the farmer's toil. The course they adopt is generally such as to bring them back to their own country by a route different from that by which they set out, but this march is not effected with impunity. The lion, the hyæna, the panther, and, above all, man, make great havoc in their ranks; many also perish from want of food, the country to which they have migrated being unable to support them, and comparatively few return to their native haunts.

While the springbok prefers the level plains with short grass, where it may be able to watch the approach of an enemy, the Reedbok (*Eleotragos arundinaceus*); selects for its favourite haunts the low grounds covered with a dense growth of reeds. It generally remains concealed until the hunter approaches, then suddenly starts up and flies to a short distance, when it stops and turns round to have a look at its pursuer. At the same time it utters a peculiar sneezing cry, evidently meant as a warning signal to its comrades, but which frequently proves the cause of its own destruction by attracting the enemy's attention.

The dense bush-forests of Africa harbour several kinds of antelopes, among others the Duiker (*Cephalophus mergens*), who at the approach of man plunges or dives, as it were, into the thicket, and glides so quietly through the bushes that he seems to have vanished, and the neat little Atro or Ben Israel of Abyssinia (*Cephalophus hemprichii*), which even the sharpest eye is scarce able to detect in its flight, so nearly does its colour resemble that of the dim underwood through which it makes its escape. In thickets which would be utterly impassable by the larger big-horned antelopes, the Atro finds an admirable refuge, particularly in the green forest borders of the water-courses, where it enjoys the shade under a thick canopy of leaves.

The Gemsbok (*A. Oryx*) is supposed to have given rise to the fable of the unicorn, from its long straight horns when seen in profile, so exactly covering one another as to give it the appearance of having but one. This robust and noble antelope, which when adult measures little less than four feet in height at the shoulder, possesses the erect mane, long sweeping black tail, and general appearance of the horse, with the head and

hoofs of an antelope. It thrives and attains a high condition in barren regions, where it might be imagined that a locust would not find subsistence, and is remarkably independent of water. Owing to the even nature of the ground which it frequents, its shy and suspicious disposition, and the extreme distance from water to which it must be followed, it is never stalked or drawn to an ambush like other antelopes, but is hunted down by a long tail-on-end chase, a feat which only the fleetest coursers are able to perform.

Among the mountain antelopes who, like the goat, love to browse among the rocks, the Klippspringer (*Oreotragus saltatrix*) is remarkable for the elastic agility with which he bounds along from crag to crag; the deep chasm, the yawning precipice, have no terrors for this sure-footed, sharp-eyed animal, which in its rapid flight over the serrated ridge bids defiance to the hunter's pursuit.

The Koodoo (*A. strepsiceros*) likewise prefers the craggy districts to the plains, and loves to browse on hills covered with sharp



KODOO.



GNU.

angular rocks, but with abundance of excellent grass and fine green bushes. When seen on the brow of any eminence, with its graceful form and fine spiral horns projected against the dark blue sky, it is decidedly one of the grandest-looking antelopes in the world.

The fantastic Wildebeest, or Gnu, of which there are two species, the black and the brindled, has the head and horns of the buffalo, and the mane and tail of a horse, supported on agile antelopine legs. Shy and suspicious at the night season, when their carnivorous enemies are abroad, the bearing of the

Gnus is bold in broad daylight, when roaming over their native plains. Wheeling about in endless circles, and performing the most extraordinary variety of intricate evolutions, the shaggy herds of these fierce-looking animals are for ever capering and gambolling round the hunter on every side. Singly, and in small troops of four or five individuals, the old bull wildebeests may be seen stationed at intervals throughout the plains, standing motionless during a whole forenoon coolly watching with a philosophic eye the movements of the other game, eternally uttering a loud snorting noise, and also a short sharp cry which is peculiar to them. When the hunter approaches these old bulls they commence whisking their long white tails in a most eccentric manner, then springing suddenly into the air, they begin prancing and capering, and pursue each other in circles at their utmost speed. When wounded they will sometimes turn upon the hunter and pursue him in turn, darting forwards on their assailant with amazing force and impetuosity, so that it requires the utmost coolness on his part to evade their attack.

In India the *Antilopa cervicapra* is consecrated to the moon, and takes the place of the capricorn among the signs of the zodiac. Numberless poems praise the beauty of this graceful animal, which resembles our fallow deer, but is somewhat smaller, and of a far more elegant shape. Such is its fleetness and activity that it often vaults over nets ten feet high, and when pursued will pass over as many yards at a single bound.



NYLGHAU.

The native haunts of the Nylghau (*A. picta*) are the dense forests of India. In the days of Aurungzebe, these large and fine antelopes abounded between Delhi and Lahore, where they were frequently chased by that mighty monarch, his army of hunters inclosing them within a limited space by means of nets.

The Great Mogul and his omrahs, attended by their huntsmen, then entered and, somewhat after the manner of a modern battue, dispatched them with their arrows and spears.

The wild Caffrarian Buffalo (*Bubalus Caffer*), the strongest

and most ferocious of the ruminant race, roams in small herds over the woody districts of South and Central Africa, where it is more feared by the natives than the lion and rhinoceros. Combining malice with brutality, it not seldom remains concealed behind a tree, till the innocent victim of its rage approaches, when, horribly bellowing, it rushes forth and attacks him with its broad-based, sharp-pointed horns. Not satisfied with goring him to death, it stamps and tears him again and again, and after having left the spot, will even return to vent once more its blind fury on the mangled corpse.

Its ponderous strength, deadly weapons, and ungovernable fury make it more than a match for the king of animals himself, who never ventures to attack a full-grown buffalo, as one toss from its horns would kill the strongest lion that ever breathed.

In India, where the wild colossal Arnee (*Bubalus Arnee*), remarkable for its enormous horns, inhabits the highlands, even the tame ordinary buffaloes feel their superiority to the large felidæ, for they have been seen to chase a tiger up the hills, bellowing as if they enjoyed the sport. The Indian herdsman, riding on a buffalo of their herd, are therefore not in the least afraid of entering the jungles infested by tigers. Colonel Rice once saw a troop of buffaloes, excited by the blood of a tiger he had wounded, throw themselves furiously into the thicket where the beast had sought refuge, beat about the bushes and tear up the ground with their horns.

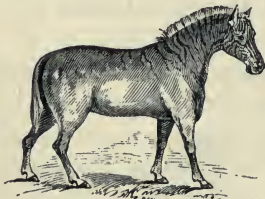
The solitary buffaloes, or such as have been expelled from the herd by stronger competitors for female favour, are particularly dangerous as they are apt to wreak their ill humour on whatever falls in their way. Dr Livingstone, among others, made the experience that to meet one of these rogue buffaloes is about as bad as to face a hungry lion or an ill-disposed rhinoceros. 'As I walked slowly,' says the illustrious traveller, 'on an extensive plain, I observed that a solitary buffalo, disturbed by others of my own party, was coming to me at a gallop. I glanced around, but the only tree on the plain was a hundred yards off, and there was no escape elsewhere. I therefore cocked my rifle, with the intention of giving him a steady shot in the forehead when he should come within three or four yards of me. The thought flashed across my mind, "What if your gun misses fire?" I placed it to my shoulder as he came on at full speed,

and that is tremendous, though generally he is a lumbering-looking animal in his paces. A small bush and bunch of grass fifteen yards off, made him swerve a little and exposed his shoulder. I just heard the ball crack there, and I fell flat on my face. The pain must have made him renounce his purpose, for he bounded close past me on to the water, where he was found dead.'

The buffaloes are generally fond of marshes or submerged river banks, where they love to wallow in the mud, or to remain plunged up to the muzzle in water. They are admirable swimmers, particularly the Bhain (*Bubalus Bhain*), a species inhabiting the sandy banks of the Ganges. Abandoning themselves to the current, these semi-aquatic ruminants often drift down the river in large herds, and are said to plunge from time to time in order to detach with their horns the water-plants growing at the bottom, which they then leisurely devour as they slowly float along.

As if to make up for the hideous deformity of the rhinoceros and hippopotamus, the African wilds exclusively give birth to the beautifully striped Zebras, the most gorgeously attired members of the equine race.

The isabelle-coloured Quagga, irregularly banded and marked with dark brown stripes, which, stronger on the head and neck, gradually become fainter, until lost behind the shoulders, has its high crest surmounted by a standing mane, banded alternately brown and white. It used formerly to be found in great numbers within the limits of the Cape Colony, and still roams in large numbers in the open plain farther to the



QUAGGA.

north, where it may often be seen herding together with gnus and springboks.

Thus in the desert of the Meritsane, Major Harris, after crossing a park of magnificent camelthorn trees, soon perceived large herds of quaggas and brindled gnus, which continued to join each other, until the whole plain seemed alive. The clatter of their hoofs was perfectly astounding, and could be compared to nothing but to the din of a tremendous charge of cavalry, or the rushing of a mighty tempest. The accumulated

numbers could not be estimated at less than 15,000, a great extent of country being actually chequered black and white with their congregated masses.

The Douw, or Burchell's Zebra, differs little from the common quagga in point of shape or size; but while the latter is faintly striped only on the head and neck, the former is adorned over every part of the body with broad black bands, beautifully contrasting with a pale yellow ground.

Major Harris, who had so many opportunities of seeing this fine species in a state of nature, remarks that—'Beautifully clad by the hand of nature, possessing much of the graceful symmetry of the horse, with great bones and muscular power; united to easy and stylish action, thus combining comeliness of figure with solidity of form, this species, if subjugated and domesticated, would assuredly make the best pony in the world. Although it admits of being tamed to a certain extent with the greatest facility—a half-domesticated specimen, with a jockey on its brindled back, being occasionally exposed in Cape Town for sale—it has hitherto contrived to evade the yoke of servitude. The senses of sight, hearing, and smell are extremely delicate. The slightest noise or motion, no less than the appearance of any object that is unfamiliar, at once rivets their gaze, and causes them to stop and listen with the utmost attention; any taint in the air equally attracting their olfactory organs.

'Instinct having taught these beautiful animals that in union consists their strength, they combine in a compact body when menaced by an attack, either from man or beast; and, if overtaken by the foe, they unite for mutual defence, with their heads together in a close circular band presenting their heels to the enemy, and dealing out kicks in equal force and abundance. Beset on all sides, or partially crippled, they rear on their hind legs, fly at their adversary with jaws distended, and use both teeth and heels with the greatest freedom.'



ZEBRA.

Whilst the douw and the quagga roam over the plains, the Zebra inhabits mountainous regions only. The beauty of its light symmetrical form is enhanced by the narrow black

bands with which the whole of the white-coloured body is covered.

Travellers through the African wilds have sometimes been startled by piteous wailings, resembling the faint gasps and stifled groanings of a drowning man. On approaching the spot where they supposed some ravenous beast was lacerating an unfortunate native, they were surprised to find a zebra in its last agonies; and well may the dying moans of the animal be sorrowful, when we consider that its usual neighings, when heard from a distance, are of a very melancholy sound.

Captain Harris tells us that it seeks the wildest and most sequestered spots, so that it is extremely difficult of approach, not only from its watchful habits and very great agility of foot, but also from the inaccessible nature of its abode. The herds graze on the steep hill-side, with a sentinel posted on some adjacent crag, ready to sound the alarm in case of any suspicious approach to their feeding quarters, and no sooner is the alarm given than away they scamper, with pricked ears and whisking their tails aloft, to places where few, if any, would venture to pursue them.



HIPPOPOTAMUS.

## CHAPTER XXXII.

### THE HIPPOPOTAMUS.

Behemoth—Its Diminishing Number and Contracting Empire—Its Ugliness—A Rogue Hippopotamus or Solitaire—Dangerous Meeting—Intelligence and Memory of the Hippopotamus—Methods employed for Killing the Hippopotamus—Hippopotamus-Hunting on the Teoge.

‘**B**EHOLD now Behemoth, which I made with thee; he eateth grass as an ox; his bones are as strong pieces of brass; his bones are like bars of iron; he lieth under the shady trees, in the covert of the reeds and fens. The shady trees cover him with their shadow; the willows of the brook compass him about. Behold he drinketh up a river: he trusteth that he can draw up Jordan into his mouth.’

Thus, in the book of Job, we find the Hippopotamus portrayed with few words but incomparable power.

According to the inspired poet, this huge animal seems anciently to have inhabited the waters of Palestine, but now it is nowhere to be found in Asia; and even in Africa the limits of its domain are perpetually contracting before the persecutions of man. It has entirely disappeared from Egypt and Cape Colony, where Le Vaillant found it in numbers during the last century. In many respects a valuable prize; of easy destruction, in spite, or rather on account of its size, which betrays it to the attacks of its enemies; a dangerous neighbour to

plantations, it is condemned to retreat before the waves of advancing civilisation, and would long since have been extirpated in all Africa, if the lakes and rivers of the interior of that vast den of barbarism were as busily ploughed over as ours by boats and ships, or their banks as thickly strewn with towns and villages.

For the hippopotamus is not able, like so many other beasts of the wilderness, to hide itself in the gloom of impenetrable forests, or to plunge into the sandy desert; it requires the neighbourhood of the stream, the empire of which it divides with its amphibious neighbour the crocodile. Occasionally during the day it is to be seen basking on the shore amid ooze and mud, but throughout the night the unwieldy monster may be heard snorting and blowing during its aquatic gambols; it then sallies forth from its reed-grown coverts to graze by the light of the moon, never, however, venturing to any distance from the river, the stronghold to which it retreats on the smallest alarm. It feeds on grass alone, and where there is any danger only at night. Its enormous lips act like a mowing machine, and form a path of short cropped grass as it goes on eating.

In point of ugliness the hippopotamus might compete with the rhinoceros itself. Its shapeless carcase rests upon short and disproportioned legs, and, with its vast belly almost trailing upon the ground, it may not inaptly be likened to an overgrown 'prize-pig.' Its immensely large head has each jaw armed with two formidable tusks, those in the lower, which are always the largest, attaining at times two feet in length; and the inside of the mouth resembles a mass of butcher's meat. The eyes, which are placed in prominences like the garret windows of a Dutch house, the nostrils, and ears, are all on the same plane, on the upper level of the head, so that the unwieldy monster, when immersed in its favourite element, is able to draw breath, and to use three senses at once for hours together, without exposing more than its snout. The hide, which is upwards of an inch and a half in thickness, and of a pinkish-brown colour, clouded and freckled with a darker tint, is destitute of covering, excepting a few scattered hairs on the muzzle, the edges of the ears and tail. Though generally mild and inoffensive, it is not to be wondered at that a creature like

this, which when full-grown attains a length of eleven or twelve feet, and nearly the same colossal girth, affords a truly appalling spectacle when enraged, and that a nervous person may well lose his presence of mind when suddenly brought into contact with the gaping monster. Even Andersson, a man accustomed to all sorts of wild adventure, felt rather discomposed when one night a hippopotamus, without the slightest warning, suddenly protuded its enormous head into his bivouac, so that every man started to his feet with the greatest precipitation, some of the party, in the confusion, rushing into the fire and upsetting the pots containing the evening meal.

As among the elephants and other animals, elderly males are sometimes expelled the herd, and, for want of company, become soured in their temper, and so misanthropic as to attack every boat that comes near them. The 'rogue-hippopotami' frequent certain localities well known to the inhabitants of the banks, and, like the outcast elephants, are extremely dangerous. Dr. Livingstone, passing a canoe which had been smashed to pieces by a blow from the hind foot of one of them, was informed by his men that, in case of a similar assault being made on his boat, the proper way was to dive to the bottom of the river, and hold on there for a few seconds, because the hippopotamus, after breaking a canoe, always looks for the people on the surface, and if he sees none, soon moves off. He saw some frightful gashes made on the legs of the people who, having had the misfortune to be attacked, were unable to dive.

In rivers where it is seldom disturbed, such as the Zambesi, the hippopotamus puts up its head openly to blow, and follows the traveller with an inquisitive glance, as if asking him, like the 'moping owl' in the elegy, why he comes to molest its 'ancient solitary reign'? but in other rivers, such as those of Londa, where it is much in danger of being shot, it takes good care to conceal its nose among water-plants, and to breathe so quietly that one would not dream of its existence in the river, except by footprints on the banks. Notwithstanding its stupid look—its prominent eyes and naked snout giving it more the appearance of a gigantic boiled calf's head than anything else—the huge creature is by no means deficient in intelligence, knows how to avoid pitfalls, and has so good a memory that, when it has once heard a ball whiz about its ears, it never after

ceases to be wide-awake at the approach of danger. Being vulnerable only behind the ear, however, or in the eye, it requires the perfection of rifle-practice to be hit; and when once in the water, is still more difficult to kill, as it dives and swims with all the ease of a walrus, its huge body being rendered buoyant by an abundance of fat. Its flesh is said to be delicious, resembling the finest young pork, and is considered as great a delicacy in Africa as a bear's paw or a bison's hump in the prairies of North America. The thick and almost inflexible hide may be dragged from the ribs in strips, like the planks from a ship's side. These serve for the manufacture of a superior description of *sjambok*, the elastic whip with which the Cape boor governs his team of twelve oxen or more, while proceeding on a journey. In Northern Africa it is used to chastise refractory dromedaries or servants; and the ancient Egyptians employed it largely in the manufacture of shields, helmets, and javelins.

But the most valuable part of the hippopotamus is its teeth (canine and incisors), which are considered greatly superior to elephant ivory, and, when perfect and weighty, will fetch as much as one guinea per pound, being chiefly used for artificial teeth, since it does not readily turn yellow. All these uses to which the hippopotamus may be applied are naturally as many prices set upon its head; and the ravages it occasions in the fields are another motive for its destruction. On the White Nile the peasantry burn a number of fires, to scare the huge animal from their plantations, where every footstep ploughs deep furrows into the marshy ground. At the same time, they keep up a prodigious clamour of horns and drums, to terrify the ruinous brute, which, as may well be imagined, is by no means so great a favourite with them as with the visitors of the Zoological Gardens.

They have besides another, and, where it succeeds, a far more efficacious method of freeing themselves from its depredations. They remark the places it most frequents, and there lay a large quantity of pease. When it comes on shore, hungry and voracious, it falls to eating what is nearest, and fills its vast stomach with the pease, which soon occasion an insupportable thirst. The river being close at hand, it immediately drinks whole

buckets of water, which, by swelling the pease, cause it to blow up, like an overloaded mortar.

The natives on the Teoge, and other rivers that empty themselves into Lake Ngami, kill the hippopotamus with iron harpoons, attached to long lines ending with a float. A huge reed raft, capable of carrying both the hunters and their canoes, with all that is needful for the prosecution of the chase, is pushed from the shore, and afterwards abandoned to the stream, which propels the unwieldy mass gently and noiselessly forward. Long before the hippopotami can be seen, they make known their presence by awful snorts and grunts whilst splashing and blowing in the water. On approaching the herd—for the gregarious animal likes to live in troops of from twenty-five to thirty—the most skilful and intrepid of the hunters stands prepared with the harpoons, whilst the rest make ready to launch the canoes should the attack prove successful. The bustle and noise caused by these preparations gradually subside: at length not even a whisper is heard, and in breathless silence the hunters wait for the decisive conflict. The snorting and plunging become every moment more distinct; a bend in the stream still hides the animals from view; but now the point is passed, and monstrous figures, that might be mistaken for shapeless cliffs, did not ever and anon one or the other of them plunge and reappear, are seen dispersed over the troubled waters. On glides the raft, its crew worked up to the highest pitch of excitement, and at length reaches the herd, which, perfectly unconscious of danger, continue to enjoy their sports. Presently one of the animals is in immediate contact with the raft. Now is the critical moment; the foremost harpooner raises himself to his full height to give the greater force to the blow, and the next instant the iron is buried deep in the body of the bellowing hippopotamus. The wounded animal plunges violently and dives to the bottom, but all its efforts to escape are as ineffectual as those of the seal when pierced with the barbed iron of the Greenlander.

As soon as it is struck, one or more of the men launch a canoe from off the raft, and hastening to the shore with the harpoon line, take a round turn with it about a tree, so that the animal may either be brought up at once, or should there be too great a strain on the line, 'played,' like a trout or salmon by

the fisherman. Sometimes both line and buoy are cast into the water, and all the canoes being launched from off the raft, chase is given to the poor brute, who whenever he comes to the surface is saluted with a shower of javelins. A long trail of blood marks his progress, his flight becomes slower and slower, his breathing more oppressive, until at last, his strength ebbing away through fifty wounds, he floats dead on the surface.

But as the whale will sometimes turn upon his assailants, so also the hippopotamus not seldom makes a dash at his persecutors, and either with his tusks, or with a blow from his head, staves in or capsizes the canoe. Sometimes even, not satisfied with wreaking his vengeance on the craft, he seizes one or other of the crew, and with a single grasp of his jaws, either terribly mutilates the poor wretch or even cuts his body fairly in two.

The natives of Southern Africa, also resort to the ingenious but cruel plan of destroying the hippopotamus by means of a trap, consisting of a beam, four or five feet long, armed with a spear-head or hard wood spike, covered with poison, and suspended to a forked pole by a cord, which coming down to the path, is held by a catch, to be set free when the beasts tread on it. On the banks of many rivers these traps are set over every track which the animals have made in going up out of the water to graze; but the hippopotami, being wary brutes, are still very numerous. While Dr. Livingstone was on the River Shine, a hippopotamus got frightened by the ship, as she was steaming close to the banks. In its eager hurry to escape from an imaginary danger, the poor animal fell into a very real one, for rushing on shore, it ran directly under a trap, when down came the heavy beam on its back, driving the poisoned spear-head a foot deep in its flesh. In its agony, it plunged back into the river, where it soon after expired.



RHINOCEROS.

## CHAPTER XXXIII.

### THE RHINOCEROS.

Brutality of the Rhinoceros—The Borelo—The Keitloa—The Monoho—The Kobaaba—Difference of Food and Disposition between the Black and the White Rhinoceros—Incarnation of Ugliness—Acute Smell and Hearing—Defective Vision—The Buphaga Africana—Paroxysms of Rage—Parental Affection—Nocturnal Habits—Rhinoceros-Hunting—Adventures of the Chase—Narrow Escapes of Messrs. Oswell and Andersson—The Indian Rhinoceros—The Sumatran Rhinoceros—The Javanese Rhinoceros—Its involuntary Suicide.

**T**HE Rhinoceros has about the same range as the elephant, but is found also in the island of Java, where the latter is unknown. Although not possessed of the ferocity of carnivorous animals, the rhinoceros is completely wild and untameable; the image of a gigantic hog, without intelligence, feeling, or docility, and though emulating the elephant in size is infinitely inferior in point of sagacity. The latter, with his beautiful, intelligent eye, awakens the sympathy of man; while the rhinoceros is the very image of brutal violence and stupidity.

It was formerly supposed that Africa had but one rhinoceros, but the researches of modern travellers have discovered no less than four different species, two white and two black, each of

them with two horns. The black species are the Borelo and the Keitlœa, which is longer, with a larger neck and almost equal horns. In both species the upper lip projects over the lower, and is capable of being extended like that of the giraffe, thus enabling the animal to grasp the branches on whose foliage he intends to feast. Both the Borelo and the Keitlœa are extremely ill-natured, and, with the exception of the buffalo, the most dangerous of all the wild animals of South Africa. The white species are the Monoho and the Kobaaba, which is distinguished by one of its horns attaining the prodigious length of four feet.

Although the black and white rhinoceroses are members of the same family, their mode of living and disposition are totally different. The food of the former consists almost entirely of roots, which they dig up with their larger horn, or of the branches and sprouts of the thorny acacia, while the latter exclusively live on grasses. Perhaps in consequence of their milder food, they are of a timid unsuspecting nature, which renders them an easy prey, so that they are fast melting away before the onward march of the European trader; while the black species, from their greater ferocity and wariness, maintain their place much longer than their more timid relations. The different nature of the black and white rhinoceroses shows itself even in their flesh, for while that of the former, living chiefly on arid branches, has a bitter taste, and but little recommends itself by its meagreness and toughness—these animals, like the generality of ill-natured creatures, being never found with an ounce of fat on their bones—that of the latter is juicy and well-flavoured.

The shape of the rhinoceros is unwieldy and massive; its vast paunch hangs down nearly to the ground; its short legs are of columnar strength, and have three toes on each foot; the misshapen head has long and erect ears, and ludicrously small eyes; the skin, which is completely naked, with the exception of some coarse bristles at the extremity of the tail, and the upper end of the ears, is comparatively smooth in the African species, but extremely rough in the Asiatic, hanging in large folds about the animal like a mantle; so that, summing up all these characters, the rhinoceros has no reason to complain of injustice, if we style it the very incarnation of ugliness. From the snout to the tip of

the tail, the African rhinoceros attains a length of from 15 to 16 feet, a girth of from 10 to 12, a weight of from 4,000 to 5,000 pounds; but, in spite of its ponderous and clumsy proportions, it is able to speed like lightning, particularly when pursued. It then seeks the nearest wood, and dashes with all its might through the thicket. The trees that are dead or dry are broken down as with a cannon shot, and fall behind it and on its sides in all directions; others that are more pliable, greener, or full of sap are bent back by its weight and the velocity of its motions, and restore themselves like a green branch to their natural position, after the huge animal has passed. They often sweep the incautious pursuer and his horse from the ground, and dash them in pieces against the surrounding trees.

The rhinoceros is endowed with an extraordinary acuteness of smell and hearing; he listens with attention to every sound, and is able to scent from a great distance the approach of man; but as the range of his small and deep-set eyes is impeded by his unwieldy horns, he can only see what is immediately before him, so that if one be to leeward of him, it is not difficult to approach within a few paces. The Kobaaba, however, from its horn being projected downwards, so as not to obstruct the line of vision, is able to be much more wary than the other species.

To make up for the imperfection of its sight, the rhinoceros is frequently accompanied by a bird (*Buphaga Africana*) which warns the beast of approaching danger by its cry. 'Many a time,' says Gordon Cumming, 'have these watchful attendants disappointed me in my stalk. They are the best friends the rhinoceros has, and rarely fail to awaken him, even in his soundest nap. He perfectly understands their warning, and springing to his feet, he generally first looks about him in every direction, after which he invariably makes off. I have often hunted a rhinoceros on horseback which led me a chase of many miles, and required a number of shots before he fell, during which chase several of these birds remained by the rhinoceros to the last. They reminded me of mariners on the deck of some bark sailing on the ocean, for they perched along his back and sides; and as each of my bullets told on the shoulder of the rhinoceros, they ascended about six feet into the air, uttering their harsh cry of alarm, and then resumed their position. It sometimes happened that the lower branches

of trees, under which the rhinoceros passed, swept them from their living deck, but they always recovered their former station; they also adhere to the rhinoceros during the night. I have often shot these animals at midnight when drinking at the fountains, and the birds imagining they were asleep, remained with them till morning, and on my approaching, before taking flight, they exerted themselves to their utmost to awaken the rhinoceros from his deep sleep.'

The black rhinoceroses are of a gloomy melancholy temper, and not seldom fall into paroxysms of rage without any evident cause, often ploughing up the ground for several yards with their horn, and assaulting large bushes in the most violent manner. On these they work for hours with their horns, at the same time snorting and blowing loudly, nor do they leave them in general until they have broken them into pieces. Seeing the creatures in their wild haunts, cropping the bushes, or quietly moving through the plains, you might take them for the most inoffensive animals of all Africa, but when roused to passion there is nothing more terrific on earth. All the beasts of the wilderness are afraid of the uncouth Borelo. The lion silently retires from its path, and even the elephant is glad to get out of the way. Yet this brutal and stupidly hoggish animal is distinguished by its parental love, and the tenderness which it bestows on its young is returned with equal affection.

Although not gregarious, and most generally solitary or grazing in pairs, yet frequently as many as a dozen rhinoceroses are seen pasturing and browsing together. As is the case with many other tropical animals, the huge beast awakens to a more active life after sunset. It then hastens to the lake or river to slake its thirst or to wallow in the mud, thus covering its hide with a thick coat of clay, against the attacks of flies; or to relieve itself from the itching of their stings, it rubs itself against some tree, and testifies its inward satisfaction by a deep-drawn grunt. During the night, it rambles over a great extent of country, but soon after sunrise seeks shelter against the heat under the shade of a tree or rock, where it spends the greater part of the day in sleep, either stretched at full length or in a standing position. Thus seen from a distance, it might easily be mistaken for a huge block of stone.

The rhinoceros is hunted in various manners. One of the most approved plans is to stalk the animal, either when feeding or reposing. If the sportsman keep well under the wind, and there be the least cover, he has no difficulty in approaching the beast within easy range, when, if the ball be well directed, it is killed on the spot. But by far the most convenient way of destroying the animal is to shoot it from a cover or a screen, when it comes to the pool to slake its thirst. Occasionally it is also taken in pitfalls. Contrary to common belief, a leaden ball (though spelter is preferable) will easily find its way through the hide of the African rhinoceros, but it is necessary to be within thirty or forty paces of the brute, and desirable to have a double charge of powder. The most deadly part to aim at is just behind the shoulder; a ball through the centre of the lobes of the lungs is certain to cause almost instantaneous death. A shot in the head never or rarely proves fatal, as the brain, which, in proportion to the bulk of the animal, does not attain the three-hundredth part of the size of the human cerebrum, is protected, besides its smallness, by a prodigious case of bone, hide, and horn. However severely wounded the rhinoceros may be, he seldom bleeds externally. This is attributable in part, no doubt, to the great thickness of the hide and its elasticity, which occasions the hole caused by the bullet nearly to close up, as also from the hide not being firmly attached to the body, but constantly moving.

From what has been related of the fury of the rhinoceros, its pursuit must evidently be attended with considerable danger, and thus the annals of the wild sports of Southern Africa are full of hair-breadth escapes from its terrific charge. Once Mr. Oswell, having lodged a ball in the body of a huge white rhinoceros, was surprised to see the beast, instead of seeking safety in flight, as is generally the case with this inoffensive species, suddenly stop short, and having eyed him curiously for a second or two, walk slowly towards him. Though never dreaming of danger, he instinctively turned his horse's head away; but strange to say, this creature, usually so docile, now absolutely refused to give him his head. When at last he did so, it was too late, for although the rhinoceros had only been walking, the distance was now so small that contact was unavoidable. In another moment the brute bent low his

head, and with a thrust upwards, struck his horn into the ribs of the horse with such force as to penetrate to the very saddle on the opposite side, where the rider felt its sharp point against his leg. The violence of the blow was so tremendous as to cause the horse to make a complete somersault in the air, coming heavily down on his back. The rider was, of course, violently precipitated to the ground. While thus prostrated, he saw the horn of the monster alongside of him; but without attempting to do any further mischief, the brute started off at a canter from the scene of action. If the rhinoceros imagined it had come off as victor, it was, however, soon undeceived; for Mr. Oswell, rushing upon one of his companions, who by this time had come up, and unceremoniously pulling him off his horse, leapt into the saddle, and without a hat, and his face streaming with blood, was quickly in pursuit of the beast, which he soon had the satisfaction to see stretched lifeless at his feet.

Mr. Andersson, another well-known African Nimrod, having one day wounded a black rhinoceros, and being in an unfavourable situation for renewing his shot with deadly effect, the monster, snorting horribly, erecting its tail, keeping its head close to the ground, and raising clouds of dust by its feet, rushed at him furiously. 'I had only just time to level my rifle and fire,' says this adventurous traveller, 'before it was upon me, and the next instant knocked me to the ground. The shock was so violent as to send my rifle, powder-flask, and ball-pouch spinning ten feet high in the air. On the beast charging me, it crossed my mind that, unless gored at once by its horn, its impetus would be such as to carry it beyond me, and I might thus be afforded a chance of escape, and so, indeed, it happened, for, having been tumbled over and trampled on with great violence, the fore-quarter of the enraged brute passed over my body. Struggling for life, I seized my opportunity, and as the animal was recovering itself for a renewal of the charge, scrambled out from between its hind legs. But the infuriated rhinoceros had not yet done with me, for scarcely had I regained my feet, before he struck me down a second time, and with his horn ripped up my right thigh (though not very deeply) from near the knee to the hip: with his fore-feet, moreover, he hit me a terrific blow on the left shoulder, near the back of the neck. My ribs bent under the enormous weight and pressure,

and for a moment I must, as I believe, have lost consciousness; I have at least very indistinct notions of what afterwards took place. All I remember is, that when I raised my head, I heard a furious snorting and plunging amongst the neighbouring bushes. I now arose, though with great difficulty, and made my way in the best manner I was able towards a large tree near at hand for shelter; but this precaution was needless; the beast, for the time at least, showed no inclination further to molest me. Either in the *mêlée*, or owing to the confusion caused by its wounds, it had lost sight of me, or felt satisfied with the revenge it had taken. Be that as it may, I escaped with life, though sadly wounded and severely bruised, in which disabled state I had great difficulty in getting back to my screen.'

The rhinoceros is hunted for its flesh, its hide (which is manufactured into the best and hardest leather that can be imagined), and its horns, which, being capable of a high polish, fetch at the Cape a higher price than ordinary elephant ivory. It is extensively used in the manufacture of sword-handles, drinking-cups, ramrods for rifles, and a variety of other purposes. Among Oriental princes, goblets made of rhinoceros horn are in high esteem, as they are supposed to have the virtue of detecting poison by causing the deadly liquid to ferment till it flows over the rim, or, as some say, to split the cup.

The number of rhinoceroses destroyed annually in South Africa is very considerable. Messrs. Oswell and Varden killed in one year no less than eighty-nine, and in one journey, Andersson shot, single-handed, nearly two-thirds of this number. It is thus not to be wondered at that the rhinoceros, which formerly ranged as far as the Cape, is now but seldom found to the south of the tropic.

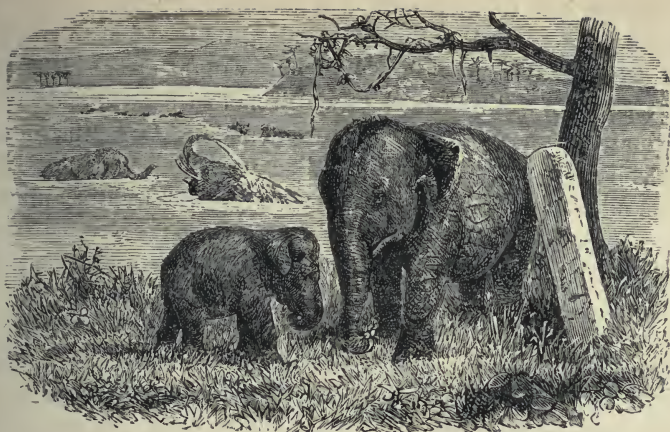
The single-horned Indian rhinoceros was already known to the ancients, and not unfrequently doomed to bleed in the Roman amphitheatres. One which was sent to King Emanuel of Portugal in the year 1513, and presented by him to the Pope, had the honour to be pictured in a woodcut by no less an artist than Albrecht Dürer himself. Latterly, rhinoceroses have much more frequently been sent to Europe, particularly the Asiatic species, and all the chief zoological gardens possess specimens of the unwieldy creature.

In its native haunts, the Indian rhinoceros leads a tranquil

indolent life, wallowing on the marshy border of lakes and rivers, and occasionally bathing itself in their waters. Its movements are usually slow, and it carries its head low like the hog, ploughing up the ground with its horn, and making its way by sheer force through the jungle. Though naturally of a quiet and inoffensive disposition, it is very dangerous when provoked, charging with resistless impetuosity, and trampling down or ripping up with its horn any animal which opposes it.

Besides the single-horned species which inhabits the Indian peninsula, Java, and Borneo, Sumatra possesses a rhinoceros with a double horn, which is, however, distinguished from the analogous African species by the large folds of its skin, and its smaller size. It is even asserted that there exists in the same island a hornless species, and another with three horns. There surely can be no better proof of the difficulties which Natural History has to contend with in the wilder regions of the tropical zone, and of the vast field still open to future zoologists, than that, in spite of all investigations, we do not yet even know with certainty all the species of so large a brute as the rhinoceros.

In Java, this huge pachyderm is met with in the jungles of the low country, but its chief haunts are the higher forest-lands, which contain many small lakes and pools, whose banks are covered with high grasses. In these solitudes, which are seldom visited by man, the rhinoceros finds all that it requires for food and enjoyment. As it is uncommonly shy, the traveller rarely meets it; but sometimes, while threading his way through the thicket, he may chance to surprise wild steers and rhinoceroses grazing on the brink of a pool, or quietly lying in the morass. The grooved paths of the rhinoceros, deeply worn into the solid rock, are found even on the summits of mountains above the level of the sea. They are frequently used for the destruction of the animal, for in the steeper places, where, on climbing up or down, it is obliged to stretch out its body, so that the abdomen nearly reaches the ground, the Javanese fix large scythe-like knives into the rock, which they cover with moss and herbage, thus forcing the poor rhinoceros to commit an involuntary suicide, and teaching him, though too late to profit by his experience, how difficult it is to escape the cunning of man.



ELEPHANTS.

## CHAPTER XXXIV.

### THE ELEPHANT.

Love of Solitude, and Pusillanimity—Miraculous Escape of an English Officer—Sagacity of the Elephant in ascending Hills - Organisation of the Stomach—The Elephant's Trunk—Use of the Tusks still Problematical—The Rogue-Elephant—Sagacity of the Elephant—The African Elephant—Tamed in Ancient Times—South African Elephant—Hunting—Hair-breadth Escapes—Abyssinian Elephant-Hunters—Cutting-up of an Elephant—The Asiatic Elephant—Vast Numbers destroyed in Ceylon—Major Rogers—Elephant-Catchers—Their amazing Dexterity—The Corral—Decoy Elephants—Their astonishing Sagacity—Great Mortality among the Captured Elephants—Their Services.

OF a mild and peaceful disposition, the image of strength tempered by good nature, the Elephant loves the shady forest and the secluded lake. Disliking the glare of the midday sun, he spends the day in the thickest woods, devoting the night to excursions and to the luxury of the bath, his great and innocent delight. Though the earth trembles under his strides, yet, like the whale, he is timid; but this timidity is accounted for by his small range of vision. Anything unusual strikes him with terror, and the most trivial objects and incidents, from being imperfectly discerned, excite his suspicions. To this peculiarity an English officer, chased and seized by an elephant

which he had slightly wounded, owed his almost miraculous escape. The animal had already raised its fore-foot to trample him to death, when, its forehead being caught at the instant by the tendrils of a climbing plant which had suspended itself from the branches above, it suddenly turned and fled.\* An instinctive consciousness that his superior bulk exposes him to danger from sources that might be harmless in the case of lighter animals, is probably the reason why the elephant displays a remarkable reluctance to face the slightest artificial obstruction on his passage. Even when enraged by a wound, he will hesitate to charge his assailant across an intervening hedge, suspecting it may conceal a snare. Unlike the horse, he never gets accustomed to the report of fire-arms, and thus no longer plays an active part in battle as in the times of Pyrrhus and Hannibal, but serves in a modern campaign merely as a common beast of burden, or for the transport of heavy artillery.

To make up for his restricted vision, his neck being so formed as to render him incapable of directing the range of his eye much above the level of his head, he is endowed with a remarkable power of smell, and a delicate sense of hearing, which serve to apprise him of the approach of danger.

Although, from their huge bulk, the elephants might be supposed to prefer a level country, yet, in Asia at least, the regions where they most abound are all hilly and mountainous. In Ceylon, particularly, there is not a range so high as to be inaccessible to them, and so sure-footed are they that, provided there be solidity to sustain their weight, they will climb rocks, and traverse ledges where even a mule dare not venture.

Dr. Hooker admired the judicious winding of the elephant's path in the Himalayas, and Sir J. E. Tennent describes the sagacity which he displays in laying out roads, or descending abrupt banks, as almost incredible. 'His first manœuvre is to kneel down close to the edge of the declivity, placing his chest to the ground, one fore-leg is then cautiously passed a short way down the slope, and if there is no natural protection to afford a firm footing, he speedily forms one by stamping into the soil if moist, or kicking out a footing if dry. This point gained, the other fore-leg is brought down in the same way, and per-

\* Sir James Emerson Tennent: 'Ceylon,' vol. ii. p. 288. Fourth Edition.

forms the same work, a little in advance of the first, which is thus at liberty to move lower still. Then, first one and then the second of the hind-legs is carefully drawn over the side, and the hind-feet in turn occupy the resting-places previously used and left by the fore ones. The course, however, in such precipitous ground is not straight from top to bottom, but slopes along the face of the bank, descending till the animal gains the level below.'

The stomach of the elephant, like that of the camel or the llama, is provided with a cavity, serving most probably as a reservoir for water against the emergencies of thirst; but the most remarkable feature in the organisation of the 'Leviathan of the land' is his wonderful trunk, which, uniting the flexibility of the serpent with a giant's power, almost rivals the human hand by its manifold uses and exquisite delicacy of touch.

'Nearly eight feet in length, and stout in proportion to the massive size of the whole animal, this miracle of nature,' as it is well expressed by Mr. Broderip, 'at the volition of the elephant will uproot trees or gather grass; raise a piece of artillery or pick up a comfit; kill a man or brush off a fly. It conveys the food to the mouth, and pumps up the enormous draughts of water, which, by its recurvature, are turned into and driven down the capacious throat, or showered over the body. Its length supplies the place of a long neck, which would have been incompatible with the support of the large head and weighty tusks.' A glance at the head of the elephant will show the thickness and strength of the trunk at its insertion; and the massy arched bones of the face and thick muscular neck are admirably adapted for supporting and working this incomparable instrument, which is at the same time the elephant's most formidable defensive weapon, for, first prostrating any minor assailant by means of his trunk, he then crushes him by the pressure of his enormous weight.

The use of the elephant's tusks is less clearly defined. Though they are frequently described as warding off the attacks of the tiger and rhinoceros, often securing the victory by one blow, which transfixes the assailant to the earth, it is perfectly obvious, both from their almost vertical position and the difficulty of raising the head above the level of the shoulder, that they were never designed for weapons of attack. No doubt

they may prove of great assistance in digging up roots, but that they are far from indispensable is proved by their being but rarely seen in the females, and by their almost constant absence in the Ceylon elephant, where they are generally found reduced to mere stunted processes.

The elephants live in herds, usually consisting of from ten to twenty individuals, and each herd is a family, not brought together by accident or attachment, but owning a common lineage and relationship. In the forest several herds will browse in close contiguity, and in their expeditions in search of water they may form a body of possibly one or two hundred, but on the slightest disturbance, each distinct herd hastens to re-form within its own particular circle, and to take measures on its own behalf for retreat or defence.

Generally the most vigorous and courageous of the herd assumes the leadership: his orders are observed with the most implicit obedience, and the devotion and loyalty evinced by his followers are very remarkable. In Ceylon this is more readily seen in the case of a tusker than in any other, because in a herd he is generally the object of the keenest pursuit by the hunters. On such occasions the elephants do their utmost to protect him from danger; when driven to extremity, they place the leader in the centre, and crowd so eagerly in front of him that the sportsmen have to shoot a number which they might otherwise have spared.

When individuals have been expelled from a herd, or by some accident have lost their former associates, they are not permitted to attach themselves to any other family, and ever after wander about the woods as outcasts from their kind. Rendered morose and savage from rage and solitude, they not only commit great injuries in the plantations, trampling down the rice-grounds, and tearing up the trees, but even travellers are exposed to the utmost risk from their unprovoked assaults.

As the elephant surpasses all other land animals in strength and weight, his mental faculties also assign to him one of the first places in the animal creation. His docility, his attachment to his master, his ready obedience, are qualities in which he is scarcely inferior to the dog, and it is astonishing how easily he suffers himself to be led by his puny guide.

The dog has been the companion of man through an end-

less series of generations, a servitude of many centuries has modified his physical and moral type; but the elephant, whom, in spite of his prodigious powers, we train to an equal obedience, is always originally the free-born son of the forest (for he never propagates in a state of captivity), and is often advanced in years before being obliged to change the independence of the woods for the yoke of thralldom. What services might not be expected from so gifted an animal were we able to educate the species as we do the individual?

The elephant inhabits both Asia and Africa, but each of these two parts of the world has its peculiar species. The African elephant is distinguished by the lozenge-shaped prominences of ivory and enamel on the surface of his grinders, which in the Indian elephant are narrow transverse parts of uniform breadth; his skull has a more rounded form, and is deficient in the double lateral bump conspicuous in the former; and he has only fifty-four vertebræ, while the Indian has sixty-one. On the other hand, he possesses twenty-one ribs, while the latter has only nineteen. His tusks are also much larger, and his body is of much greater bulk, as the female attains the stature of the full-grown Indian male. The ear is at least three times the size, being not seldom above four feet long and broad, so that Dr. Livingstone mentions having seen a negro who under cover of one of these prodigious flaps effectually screened himself from the rain.

The African elephant has a very wide range, from Caffraria to Nubia, and from the Zambesi to Cape Verde, and the impenetrable deserts of the Sahara alone prevent him from wandering to the shores of the Mediterranean. Although in South Africa the persecutions of the natives, and of his still more formidable enemies—the colonists and English huntsmen, have considerably thinned his numbers, and driven him farther and farther to the north, yet in the interior of the country he is still met with in prodigious numbers. Dr. Barth frequently saw large herds winding through the open plains, and swimming in majestic lines through the rivers with elevated trunks, or bathing in the shallow lakes for coolness or protection against insects.

Dr. Livingstone gives us many interesting accounts of South African elephant-hunting. The Banijai on the south bank of

the Zambesi erect stages on high trees overhanging the paths by which the elephants come, and then use a heavy spear four or five feet long. When the unfortunate animal comes beneath, they throw this formidable weapon, and if it enters between the ribs above, as the blade is at least twenty inches long by two broad, the motion of the handle, as it is aided by knocking against the trees, makes frightful gashes within, and soon causes death. They kill them also by means of a spear inserted in a beam of wood, which being suspended on the branch of a tree by a cord attached to a latch, fastened in the path and intended to be struck by the animal's foot, leads to the fall of the beam, and the spear being poisoned, causes death in a few hours.

On the sloping banks of the Zouga the Bayeiye dig deep pitfalls to entrap the animals as they come to drink, but though these traps are constructed with the greatest ingenuity, old elephants have been known to precede the herd and whisk off their coverings all the way down to the water, or, giving proof of a still more astonishing sagacity, to have actually lifted the young out of the pits into which they had stumbled.

The Bushmen select full-moon nights for the chase, on account of the coolness, and choose the moment succeeding a charge, when the elephant is out of breath, to run in and give him a stab with their long-bladed spears. The huge creature is often bristling with missile weapons like a porcupine, and though singly none of the wounds may be mortal, yet their number overpowers him by loss of blood.

In the Lake Districts discovered by Captain Burton, the elephant is hunted in a somewhat similar manner. A tusker having been artfully separated from the herd without exciting suspicion, the hunting party, consisting of from fifteen to twenty individuals, close in a deadly circle round the victim. The headman then rising with a shout, hurls the first spear, and his example is followed by the rest. The weapons are not poisoned—they are fatal by a succession of small wounds. The baited beast rarely breaks, as might be expected, through the frail circle of assailants; its proverbial obstinacy is excited, it charges one man, who slips away, when another with a scream thrusts the long stiff spear into its hind-quarters, which makes it change its intention and turn fiercely from the fugitive to the fresh assailant. This continues till the elephant, losing breath

and heart, attempts to escape ; its enemies then redouble their efforts, and at length the huge prey, overpowered by pain and loss of blood, trickling from a hundred wounds, bites the dust. The victors, after certain preliminaries of singing and dancing, carefully cut out the tusks, and devour the rich marrow upon the spot. The chase concludes with a grand feast of fat and garbage, and the hunters return home in triumph, laden with ivory, with ovals of hide for shields, and with festoons of raw meat spitted upon long poles.

The cutting-up of an elephant by a negro tribe is quite a unique spectacle. The men stand round the animal in dead silence, while the chief of the party declares that, according to ancient law, the head and right hind-leg belong to him who inflicted the first wound ; the left leg to him who delivered the second, or first touched the animal after it fell, and different parts to the headmen of the different groups of which the camp is composed, not forgetting to enjoin the preservation of the fat and bowels for a second distribution. This oration finished, the natives soon become excited, and scream wildly as they cut away at the carcase with a score of spears, whose long handles quiver in the air above their heads. Their excitement becomes momentarily more and more intense, and reaches the culminating point when, as denoted by a roar of gas, the huge mass is laid fairly open. Some jump inside and roll about there in their eagerness to seize some precious morsel, while others run off screaming with pieces of the bloody meat, throw it on the grass, and run back for more ; all keep talking and shouting at the utmost pitch of their voices. Sometimes two or three, regardless of all laws, seize the same piece of meat, and have a brief fight of words over it. Occasionally an agonized yell bursts forth, and a native emerges out of the huge carcase with his hand badly cut by the spear of his excited friend and neighbour.

A much more formidable enemy of this noble animal than the spears or pitfalls of the African barbarians is the rifle, particularly in the hands of a European marksman ; for while the natives generally stand at the distance of a hundred yards or more, and of course spend all the force of their bullets on the air, the English hunters, relying on their steadiness of aim, approach to within thirty yards of the animal, where they are

sure not to waste their powder. The consequence is, that when the Griquas kill one elephant, such marksmen as Gordon Cumming and Andersson will bring at least twenty to the ground, and this difference is the more remarkable as the natives employ dogs to assist them, while the English trust to themselves alone. It requires no little nerve to brave the charge of the elephant, the scream or trumpeting of the brute, when infuriated, being more like what the shriek of a steam-whistle would be to a man standing on the dangerous part of a railroad, than any other earthly sound, so that a horse unused to it will sometimes stand shivering instead of taking his rider out of danger, or fall paralysed by fear.

Even the most experienced hunters have many dangers to encounter while facing their gigantic adversary. Thus, on the banks of the Zouga, Mr. Oswell had one of the most extraordinary escapes from a wounded elephant perhaps ever recorded in the annals of the chase. Pursuing the brute into the dense thorny bushes met with on the margin of that river, and to which the elephant usually flees for safety, he followed it through a narrow pathway by lifting up some of the branches and forcing his way through the rest; but when he had just got over this difficulty, he saw the elephant, whose tail he had but got glimpses of before, now rushing full speed towards him. There was then no time to lift up branches, so he tried to force his horse through them. He could not effect a passage, and as there was but an instant between the attempt and failure, the hunter tried to dismount, but in doing this one foot was caught by a branch, and the spur drawn along the animal's flank; this made him spring away, and throw the rider on the ground with his face to the elephant, which, being in full chase, still went on. Mr. Oswell saw the huge fore-foot about to descend on his legs, parted them, and drew in his breath, as if to resist the pressure of the other foot, which he expected would next descend on his body. His relief may be imagined, when he saw the whole length of the under part of the enormous brute pass over him, leaving him perfectly unhurt.

In Abyssinia the elephant is hunted in an original manner. The men who make this their chief occupation dwell constantly in the woods, and live entirely upon the flesh of the animals they kill. They are exceedingly dexterous, both on horseback and

on foot; indispensable qualities, partly inherited and partly acquired by practice. Completely naked to render their movements more easy, and to prevent their being laid hold of by the bushes, two of these bold huntsmen get on horseback; one of them bestrides the back of the steed, a short stick in one hand, the reins in the other, while behind him sits his companion, armed with a sharp broadsword. As soon as they perceive a grazing elephant, they instantly ride up to him, or cross him in all directions if he flies, uttering at the same time a torrent of abuse, for the purpose, as they fancy, of raising his anger. With outstretched trunk the elephant attempts to seize the noisy intruders, and following the perfectly trained horse, which, springing from side to side, leads him along in vain pursuit, neglects flight into the woods, his sole chance of safety; for while his whole attention is fixed on the rapid movements of the horse, the swordsman, who has sprung unperceived from its back, approaches stealthily from behind, and, with one stroke of his weapon, severs the tendon just above the heel. The disabled monster falls shrieking to the ground, and incapable of advancing a step, is soon despatched. The whole flesh is then cut off his bones into thongs, and hung upon the branches of trees till perfectly dry, when it is taken down and laid by for the rainy season.

African ivory is a not unimportant article of trade. The annual importation into Great Britain alone, for the last few years, has been about 11,000 cwts., which, taking the average weight of a tusk at thirty pounds, would imply an annual slaughter of about 20,000 elephants, doomed to destruction in order to provide us with umbrella, stick, or knife-handles, card-marks, fancy boxes, or buttons.

The Asiatic elephant inhabits Hindostan, the ultra-Gangetic peninsula, Sumatra, Borneo, and Ceylon. In the latter island especially, he was formerly found in incredible numbers, so that thirty years ago, an English sportsman killed no less than 104 elephants in three days.

A reward of a few shillings per head offered by the Government for taking elephants was claimed for 3,500 destroyed in part of the northern provinces alone, in less than three years prior to 1848, and between 1851 and 1856 a similar reward was paid for 2,000 in the southern provinces. In consequence

of this wholesale slaughter, it cannot be wondered at that the Ceylon elephant has entirely disappeared from districts in which he was formerly numerous, and that the peasantry in some parts of the island have even suspended the ancient practice of keeping watchers and fires by night to drive away the elephants from the growing crops. The opening of roads, and the clearing of the mountain-forests of Kandy for the cultivation of coffee, have forced the animals to retire to the low country, where again they have been followed by large parties of European sportsmen, and the Singhalese themselves, being more freely provided with arms than in former times, have assisted in the work of extermination.

The practice in Ceylon is to aim invariably at the head, and, generally speaking, a single ball planted in the forehead ends the existence of the noble creature instantaneously. Thus, while Prince Waldemar of Prussia, during his visit to the island, was hunting in the forests in company with Major Rogers, a celebrated Nimrod, they were charged by two elephants, the one furiously trumpeting in their rear, while the other pushed its enormous head through the bushes in front. The major, however, soon put an end to their offensive demonstrations, for springing between them, he instantly lodged one bullet behind the ear of the one, and a second in the temple of the other. As if struck by lightning, they sank to the earth with a deep hollow groan, and the remainder of the herd, terrified by their fall, hurried away into the depth of the woods.

In India and Ceylon, elephants have been caught and tamed from time immemorial, and when we compare their colossal strength with the physical weakness of man, it must surely be considered a signal triumph of his intelligence and courage, that he is able to bend such gigantic creatures to his will. The professional elephant-catchers of Ceylon, or Panickeas, as they are called, are particularly remarkable for their daring and adroitness. Their ability in tracing their huge game, rivalling that of the American Indian in following the enemy's trail, has almost the certainty of instinct, and hence their services are eagerly sought by the European elephant-hunters. 'So keen is their glance, that almost at the top of their speed, like hounds running breast-high, they will follow the course of an elephant over glades covered with stunted grass, where the eye

of a stranger would fail to discover a trace of its passage, and on through forests strewn with dry leaves, where it seems impossible to perceive a footstep. Here they are guided by a bent or broken twig, or by a leaf dropped from the animal's mouth on which they can detect the pressure of a tooth. If at fault, they fetch a circuit like a setter, till lighting on some fresh marks, they go ahead again with renewed vigour. So delicate is the sense of smell in the elephant, and so indispensable is it to go against the wind in approaching him, that the Panickeas, on those occasions when the wind is so still that its direction cannot be otherwise discerned, will suspend the film of a gossamer to determine it, and shape their course accordingly. On overtaking the game, their courage is as conspicuous as their sagacity. If they have confidence in the sportsman for whom they are finding, they will advance to the very heel of the elephant, slap him on the quarter, and then convert his timidity into anger, till he turns upon his tormentor, and exposes his heavy front to receive the bullet which is awaiting him. So fearless and confident are they, that two men without aid or attendants will boldly attempt to capture the largest-sized elephant. Their only weapon is a flexible rope made of buffalo's hide, with which it is their object to secure one of the hind-legs. This they effect either by following in his footsteps when in motion, or by stealing close up to him when at rest, and availing themselves of the propensity of the elephant at such moments to sling his feet backwards and forwards, they contrive to slip a noose over his hind-leg.

At other times, this is achieved by spreading the noose on the ground, partially concealed by roots and leaves, beneath a tree on which one of the party is stationed, whose business it is to lift it suddenly by means of a cord, raising it on the elephant's leg at the moment when his companion has succeeded in provoking him to place his foot within the circle, the other end having been previously made fast to the stem of a tree. Should the noosing be effected in open ground, and no tree of sufficient strength at hand round which to wind the rope, one of them allowing himself to be pursued by the enraged elephant, entices him towards the nearest grove, when his companion, dexterously laying hold of the rope as it trails along the ground, suddenly coils it round a suitable stem, and brings the fugitive

to a stand-still. On finding himself thus arrested, the natural impulse of the captive is to turn on the man who is engaged in making fast the rope, a movement which it is the duty of his colleague to prevent by running up close to the elephant's head, and provoking him to confront him by irritating gesticulations and incessant shouts of *dah! dah!* a monosyllable the sound of which the elephant peculiarly dislikes. Meanwhile the first assailant having secured one noose, comes up from behind with another, with which, amidst the vain rage and struggles of the victim, he entraps a fore-leg, the rope being as before secured to another tree in front, and the whole four feet having been thus entangled, the capture is completed.

‘ A shelter is then run up with branches to protect him from the sun, and the hunters proceed to build a wigwam for themselves in front of their prisoner, kindling their fires for cooking, and making all the necessary arrangements for remaining day and night on the spot, to await the process of subduing and taming his rage. Picketed to the ground like Gulliver by the Lilliputians, the elephant soon ceases to struggle, and what with the exhaustion of ineffectual resistance, the constant annoyance of smoke, and the liberal supply of food and water with which he is indulged, a few weeks generally suffice to subdue his spirit, when his keepers at length venture to remove him to their own village, or to the seaside for shipment to India.

‘ No part of the hunter's performances exhibits greater skill and audacity than this first forced march of the recently captured elephant. As he is still too morose to submit to be ridden, and it would be equally impossible to lead or to drive him by force, the ingenuity of the captors is displayed in alternately irritating and eluding his attacks, but always so attracting his attention, as to allure him along in the direction in which they want him to go.

‘ In Ceylon, the principal place for exporting these animals to India is Manaar on the western coast, to which the Arabs from the continent resort, bringing horses to be bartered for elephants. In order to reach the sea, open plains must be traversed, across which it requires the utmost patience of the Panickeas to coax their reluctant charge. At Manaar the elephants are usually detained till any wound on the leg caused by the rope has been

healed, when the shipment is effected in the most primitive manner, it being next to impossible to induce the still untamed creature to walk on board, and no mechanical contrivances being provided to ship him. A native boat, of about forty tons burthen, is brought alongside the quay, and being about three parts filled with the strong-ribbed leaves of the Palmyra palm, it is lashed so that the gunwale may be as nearly as possible on a line with the level of the wharf. The elephant, being placed with his back to the water, is forced by goads to retreat till his hind-legs go over the side of the quay; but the main contest commences when it is attempted to disengage his fore-feet from the shore, and force him to entrust himself on board. The scene becomes exciting from the screams and trumpeting of the elephants, the shouts of the Arabs, and the rushing of the crowd. Meanwhile the huge creature strains every nerve to regain the land; and the day is often consumed before his efforts are overcome, and he finds himself fairly afloat. The same boat will take from four to five elephants, who place themselves athwart it, and exhibit amusing adroitness in accommodating their own movements to the rolling of the little vessel, and in this way they are ferried across the narrow strait which separates the continent of India from Ceylon.\*

Unfortunately, my limits forbid me entering upon a detailed account of the great elephant hunts of India and Ceylon, where whole herds are driven into an enclosure and entrapped in one vast decoy. This may truly be called the sublime of sport, for nowhere is it conducted on a grander scale, or so replete with thrilling emotions. The *keddah* or *corral*, as the enclosure is called, is constructed in the depth of the forest, several hundred paces long, and half as broad, and of a strength commensurate to the power of the animals it is intended to secure. Slowly and cautiously the doomed herds are driven onwards from a vast circuit by thousands of beaters in narrowing circles to the fatal gate, which is instantly closed behind them, and then the hunters, rushing with wild clamour and blazing torches to the stockade, complete the terror of the bewildered animals. Trumpeting and screaming with rage and fear, they

\* Tennent's 'Ceylon,' vol. ii. pp. 336-340.

rush round the corral at a rapid pace, but all their attempts to force the powerful fence are vain, for wherever they assail the palisade, they are met with glaring flambeaux and bristling spears, and on whichever side they approach, they are repulsed with shouts and discharges of musketry. For upwards of an hour their frantic efforts are continued with unabated energy, till at length, stupified, exhausted, and subdued by apprehension and amazement, they form themselves into a circle, and stand motionless under the dark shade of the trees in the middle of the corral.

To secure the entrapped animals, the assistance of tame elephants or decoys is necessary, who, by occupying their attention and masking the movements of the nooser, give him an opportunity of slipping one by one a rope round their feet until their capture is completed.

The quickness of eye displayed by the men in watching the slightest movement of an elephant, and their expertness in flinging the noose over its foot, and attaching it firmly before the animal can tear it off with its trunk, are less admirable than the rare sagacity of the decoys, who display the most perfect conception of the object to be attained, and the means of accomplishing it. Thus Sir Emerson Tennent saw more than once, during a great elephant hunt which he witnessed in 1847, that when one of the wild elephants was extending his trunk, and would have intercepted the rope about to be placed over his leg, the decoy, by a sudden motion of her own trunk, pushed his aside and prevented him; and on one occasion, when successive efforts had failed to put the noose over the leg of an elephant who was already secured by one foot, but who wisely put the other to the ground as often as it was attempted to pass the noose under it, he saw the decoy watch her opportunity, and when his foot was again raised, suddenly push in her own leg beneath it, and hold it up till the noose was attached and drawn tight.

It may easily be imagined that the passage from a life of unfettered liberty in the cool and sequestered forest to one of obedience and labour, must necessarily put the health of the captured animals to a severe trial. Many perish in consequence of the fearful wounds on the legs occasioned by their struggling against the ropes, and it has frequently happened that a valu-

able animal has lain down and died the first time it was tried in harness from what the natives designate a '*broken heart.*' Official records prove that more than half of the elephants employed in the public departments of the Ceylon government die in one year's servitude, and even when fully trained and inured to captivity, the working elephant is always a delicate animal, subject to a great variety of diseases, and consequently often incapacitated from labour. Thus, in spite of his colossal strength, which cannot even be employed to its full extent, as it is difficult to pack him without chafing the skin, and waggons of corresponding dimension to his muscular powers would utterly ruin the best constructed roads, it is very doubtful whether his services are in proportion to his cost, and Sir J. E. Tennent is of opinion that two vigorous dray horses would, at less expense, do more effectual work than any elephant.

In no kind of labour does the elephant display a greater ingenuity than in dragging and piling felled timber, going on for hours disposing of log after log, almost without a hint or a direction from his attendant. In this manner two elephants, employed in piling ebony and satin wood in the yards attached to the Commissariat stores at Colombo, were so accustomed to the work that they were enabled to accomplish it with equal precision and with greater rapidity than if it had been done by dock-labourers. When the pile attained a certain height which baffled their conjoint efforts to raise one of the heavy logs of ebony to the summit, they had been taught to lean two pieces against the heap, up the inclined plane of which they gently rolled the remaining logs, and placed them trimly on the top.

Such is the earnestness and perseverance displayed by the sagacious creatures while accomplishing their task, that supervision might almost be thought superfluous; but as soon as the eye of the keeper is withdrawn, their innate love of ease displays itself, and away they stroll lazily to browse, or to enjoy the luxury of fanning themselves and blowing dust over their backs.



LEOPARD AND CHEETAH.

## CHAPTER XXXV.

### TROPICAL FELIDÆ.

The Lion—Conflicts with Travellers on Mount Atlas—The Lion and the Hottentot—A Lion taken in—Narrow Escapes of Andersson and Dr. Livingstone—Lion-Hunting by the Arabs of the Atlas—By the Bushmen—The Asiatic Lion—The Lion and the Dog—The Tiger—The Javanese Jungle—The Peacock—Wide Northern Range of the Tiger—Tiger-Hunting in India—Miraculous Escape of an English Sportsman—Animals announcing the Tiger's Presence—Turtle-Hunting of the Tiger on the Coasts of Java—The Panther and the Leopard—The Cheetah—The Jaguar—The Puma—The smaller American Felidæ—The Hyæna—Fables told of these abject Animals—The Striped Hyæna—The Spotted Hyæna—The Brown Hyæna.

**T**HE majestic form, the noble bearing, the stately stride, the fine proportions, the piercing eye, and the dreadful roar of the Lion, striking terror into the heart of every other animal, all combine to mark him with the stamp of royalty. All nerve, all muscle, his enormous strength shows itself in the tremendous bound with which he rushes upon his prey, in the

rapid motions of his tail, one stroke of which is able to fell the strongest man to the ground, and in the expressive wrinkling of his brow.

No wonder that, ever inclined to judge from outward appearances, and to attribute to external beauty analogous qualities of mind, man has endowed the lion with a nobility of character which he in reality does not possess. For modern travellers, who have had occasion to observe him in his native wilds, far from awarding him the praise of chivalrous generosity and noble daring, rather describe him as a mean-spirited robber, prowling about at night-time in order to surprise a weaker prey.

The lion is distinguished from all other members of the feline tribe by the uniform colour of his tawny skin, by the black tuft at the end of his tail, and particularly by the long and sometimes blackish mane, which he is able to bristle when under the influence of passion, and which contributes so much to the beauty of the male, while it is wanting in the lioness, who, as everyone knows, is very inferior in size and comeliness to her stately mate.

His chief food consists of the flesh of the larger herbivorous animals, very few of which he is unable to master. Concealed in the high rushes on the river's bank, he lies in ambush for the timorous herd of antelopes which at night-fall approach the water to quench their thirst. Slowly and cautiously the children of the waste advance; they listen with ears erect, they strain their eyes to penetrate the thicket's gloom, but nothing suspicious appears or moves along the bank. Long and deeply they quaff the delicious draught, when suddenly, with a giant spring, like lightning bursting from a cloud, the lion bounds upon the unsuspecting revellers, and the leader of the herd lies prostrate at his feet.

During the daytime the lion seldom attacks man, and sometimes even when meeting a traveller he is said to pass him by unnoticed; but when the shades of evening descend, his mood undergoes a change. After sunset it is dangerous to venture into the woody and wild regions of Mount Atlas, for there the lion lies in wait, and there one finds him stretched across the narrow path. It is then that dramatic scenes of absorbing interest not unfrequently take place. When, so say the Bedouins,

a single man thus meeting with a lion is possessed of an undaunted heart, he advances towards the monster brandishing his sword or flourishing his rifle high in the air, and, taking good care not to strike or to shoot, contents himself with pouring forth a torrent of abuse:—‘Oh, thou mean-spirited thief! thou pitiful waylayer! thou son of *one* that never ventured to say *no*! think’st thou I fear thee? Knowest thou whose son I am? Arise, and let me pass!’ The lion waits till the man approaches quite near to him; then he retires, but soon stretches himself once more across the path; and thus by many a repeated trial puts the courage of the wanderer to the test. All the time the movements of the lion are attended with a dreadful noise, he breaks numberless branches with his tail, he roars, he growls; like the cat with the mouse, he plays with the object of his repeated and singular attacks, keeping him perpetually suspended between hope and fear. If the man engaged in this combat keeps up his courage,—if, as the Arabs express themselves, ‘he holds fast his soul,’ then the brute at last quits him and seeks some other prey. But if the lion perceives that he has to do with an opponent whose courage falters, whose voice trembles, who does not venture to utter a menace, then to terrify him still more he redoubles the described manœuvres. He approaches his victim, pushes him from the path, then leaves him and approaches again, and enjoys the agony of the wretch, until at last he tears him to pieces.

The lion is said to have a particular liking for the flesh of the Hottentots, and it is surprising with what obstinacy he will follow one of these unfortunate savages. Thus Mr. Barrow relates the adventure of a Namaqua Hottentot, who, endeavouring to drive his master’s cattle into a pool of water enclosed between two ridges of rocks, espied a huge lion couching in the midst of the pool. Terrified at the unexpected sight of such a beast, that seemed to have his eyes fixed upon him, he instantly took to his heels. In doing this he had presence of mind enough to run through the herd, concluding that if the lion should pursue he would take up with the first beast that presented itself. In this, however, he was mistaken. The lion broke through the herd, making directly after the Hottentot, who, on turning round and perceiving that the monster had singled him out, breathless and half dead with fear, scrambled

up one of the tree-aloës, in the trunk of which a few steps had luckily been cut out to come at some birds' nests that the branches contained. At the same moment the lion made a spring at him, but missing his aim, fell upon the ground. In surly silence he walked round the tree, casting at times a dreadful look towards the poor Hottentot, who screened himself from his sight behind the branches. Having remained silent and motionless for a length of time, he at length ventured to peep, hoping that the lion had taken his departure, when to his great terror and astonishment, his eyes met those of the animal, which, as the poor fellow afterwards expressed himself, flashed fire at him. In short, the lion laid himself down at the foot of the tree, and did not remove from the place for twenty-four hours. At the end of this time, becoming parched with thirst, he went to a spring at some distance in order to drink. The Hottentot now, with trepidation, ventured to descend, and scampered off home as fast as his feet could carry him.

On account as well of the devastation which he causes among the herds as of the pleasure of the chase, the lion is pursued and killed in North and in South Africa wherever he appears: a state of war which, as may well be supposed, is not without danger for the aggressive party. Thus, Andersson once fired upon a black-maned lion, one of the largest he ever encountered in Africa. Roused to fury by the slight wound he had received, the brute rapidly wheeled, rushed upon him with a dreadful roar, and at the distance of a few paces, couched as if about to spring, having his head imbedded, so to say, between his fore paws. Drawing a large hunting-knife, and slipping it over the wrist of his right hand, Andersson dropped on one knee, and thus prepared, awaited the onset of the lion. It was an awful moment of suspense, and his situation was critical in the extreme. Still his presence of mind (a most indispensable quality in a South African hunter) never for a moment forsook him; indeed, he felt that nothing but the most perfect coolness and absolute self-command would be of any avail. He would now have become the assailant; but as, owing to the intervening bushes and clouds of dust raised by the lion's lashing his tail against the ground, he was unable to see his head, while to aim at any other part would have been

madness, he refrained from firing. Whilst intently watching every motion of the lion, the animal suddenly made a prodigious bound; but whether it was owing to his not perceiving his intended victim, who was partially concealed in the long grass, and instinctively threw his body on one side, or to his miscalculating the distance, he went clear over him, and alighted on the ground three or four paces beyond. Quick as thought Andersson now seized his advantage, and wheeling round on his knee, discharged his second barrel; and as the lion's broadside was then towards him, lodged a ball in his shoulder, which it completely smashed. The infuriated animal now made a second and more determined rush; but owing to his disabled state was happily avoided, though only within a hair's breadth, and giving up the contest, he retreated into a neighbouring wood, where his carcass was found a few days after.

Dr. Livingstone once had a still more narrow escape, for he was actually under the paws of a lion, whose fury he had roused by firing two bullets into him. 'I was upon a little height; he caught my shoulder as he sprang, and we both came to the ground below together. Growling horribly close to my ear, he shook me as a terrier-dog does a rat. The shock produced a stupor, similar to that which seems to be felt by a mouse after the first shake of the cat. It caused a sort of drowsiness in which there was no sense of pain nor feeling of terror, though quite conscious of all that was happening. It was like what patients partially under the influence of chloroform describe, who see all the operation, but feel not the knife. This singular condition was not the result of any mental process; the shake annihilated fear, and allowed no sense of horror in looking round at the beast. This peculiar state' (a fine remark) 'is probably produced in all animals killed by the carnivora; and if so, is a merciful provision by our benevolent Creator for lessening the pain of death. Turning round to relieve myself of the weight, as he had one paw on the back of my head, I saw his eyes directed to Mebalwé, who was trying to shoot him at a distance of ten or fifteen yards. His gun, a flint one, missed fire in both barrels; the lion immediately left me, and attacking Mebalwé, bit his thigh. Another man attempted to spear the lion while

he was biting Mebalwé. He left Mebalwé, and caught this man by the shoulder, but at that moment the bullets he had received took effect and he fell down dead. The whole was the work of a few moments, and must have been his paroxysm of dying rage. A wound from this animal's tooth resembles a gun-shot wound; it is generally followed by a great deal of sloughing and discharge, and pains are felt in the part periodically ever afterwards. I had on a tartan jacket on the occasion, and I believe that it wiped off all the virus from the teeth that pierced the flesh, for my two companions in this affray have both suffered from the peculiar pains, while I have escaped with only the inconvenience of a false joint in my limb. The man whose shoulder was wounded showed me his wound actually burst forth afresh on the same month of the following year. This curious point deserves the attention of inquirers.

In the Atlas, the lion is hunted in various ways. When he prowls about the neighbourhood of a Bedouin encampment, his presence is announced by various signs: at night, his dreadful roar resounds; now an ox, now a foal is missing from the herd; at length even a member of the tribe disappears. Terror spreads among all the tents, the women tremble for their children, everywhere complaints are heard. The warriors decree the death of the obnoxious neighbour, and congregate on horse and on foot at the appointed hour and place. The thicket in which the lion conceals himself during the daytime has already been discovered, and the troop advances, the horsemen bringing up the rear. About fifty paces from the bush they halt, and draw up in three rows, the second ready to assist the first in case of need, the third an invincible reserve of excellent marksmen. Then commences a strange and animated scene. The first row abusing the lion, and at the same time sending a few balls into his covert to induce him to come out, utter loud exclamations of defiance: 'Where is he who fancies himself so brave, and ventures not to show himself before men? Surely it is not the lion, but a cowardly thief, a son of Scheitan, on whom Allah's curse may rest!'

At length, the roused lion breaks forth. A momentary silence ensues. The lion roars, rolls his flaming eyes, retreats a few paces, stretches himself upon the ground, rises, smashes the branches

with his tail. The front row give fire, the lion springs forward, if untouched, and generally falls under the balls of the second row, which immediately advance towards him. This moment, so critical for the lion, whose fury is fully excited, does not end the combat till he is hit in the head or in the heart. Often his hide has been pierced by a dozen balls before the mortal wound is given, so that sometimes, in case of a prolonged contest, several of the hunters are either killed or wounded. The horsemen remain as passive spectators of the fray so long as the lion keeps upon hilly ground, but when driven into the plain, their part begins, and a new combat of a no less original and dramatic character commences; as every rider, according to his zeal or courage, spurs his horse upon the monster, fires upon him at a short distance, then rapidly wheels as soon as the shot is made, and reloads again, to prepare for a new onset. The lion, attacked on all sides, and covered with wounds, fronts everywhere the enemy, springs forward, retreats, returns, and only falls after a glorious resistance, which must necessarily end in his defeat and death, as he is no match for a troop of well-mounted Arabs. After he has spent his power on a few monstrous springs, even an ordinary horse easily overtakes him. One must have been the witness of such a fight to form an idea of its animation. Every rider utters loud imprecations, the white mantles that give so spectral an appearance to their dusky owners, fly in the air like 'streamers long and gay,' the carbines glisten, the shots resound, the lion roars; pursuit and flight alternate in rapid succession. Yet, in spite of the tumult, accidents are rare, and the horsemen have generally nothing to fear but a fall from their steed, which might bring them under the claws of their enemy, or, what is oftener the case, the ball of an incautious comrade.

The Arabs have noticed that the day after the lion has carried away a piece of cattle, he generally remains in a state of drowsy inactivity, incapable of moving from his lair. When the neighbourhood, which usually resounds with his evening roar, remains quiet, there is every reason to believe that the animal is gorged with his gluttonous repast. Then some huntsman, more courageous than his comrades, follows his trail into the thicket, levels his gun at the lethargic monster, and sends a ball into his head. Sometimes even, a hunter,

relying on the deadly certainty of his aim, and desirous of acquiring fame by a display of chivalrous courage, rides forth alone into the thicket, on a moonlight night, challenges the lion with repeated shouts and imprecations, and lays him prostrate before he can make his fatal bound.

Dr. Livingstone informs us that the Bushmen likewise avail themselves of the torpidity consequent upon a full meal, to surprise the lion in his slumbers, and shoot him with their poisoned arrows.

In ancient times, the lion was an inhabitant of south-eastern Europe. Herodotus relates that troops of lions came down the Macedonian mountains, to seize upon the baggage camels of Xerxes' army, and even in the time of Alexander the Great, the animal, though rare, was not yet completely extirpated.

In Asia also, where the lion is at present confined to Mesopotamia, the northern coast of the Persian Gulf, and the north-western part of Hindostan, he formerly roamed over far more extensive domains. The Asiatic lion differs from the African, by a more compressed form of body, a shorter mane, which sometimes is almost entirely wanting, and a much larger tuft of hair at the end of the tail.

Africa is the chief seat of the lion, the part of the world where he appears to perfection with all the attributes of his peculiar strength and beauty. There he is found in the wilds of the Atlas, as in the high mountain-lands of Abyssinia, from the Cape to Senegal, and from Mozambique to Congo, and probably more than one species of the royal animal, not yet accurately distinguished by the naturalist, roams over this vast expanse.

While the lion reigns in Africa, the Tiger is lord and master of the Indian jungles. A splendid animal—elegantly striped with black on a white and golden ground; graceful in every movement, but of a most sanguinary and cruel nature. The lengthened body resting on short legs, wants the proud bearing of the lion, while the naked head, the wildly rolling eye, the scarlet tongue constantly lolling from the jaws, and the whole expression of the tiger's physiognomy, indicate an insatiable thirst for blood, a pitiless ferocity, which he wreaks indiscriminately on every living thing that comes within his grasp. In the bamboo jungle on the banks of pools and rivers, he waits

for the approaching herd; there he seeks his prey, or rather multiplies his murders, for he often leaves the carcass of the axis or the nyghau still writhing in the agony of death, to throw himself upon new victims, whose bodies he rends with his claws, and then plunges his head into the gaping wound to absorb with deep and luxurious draughts the blood whose fountains he has just laid open.

Nothing can be more delightful than the aspect of a Javanese savannah, to which clumps of noble trees, planted by Nature's hand, impart a park-like character; yet even during the daytime, the traveller rarely ventures to cross these beautiful wilds without being accompanied by a numerous retinue. The horses frequently stand still, trembling all over, when their road leads them along some denser patch of the jungle, rising like an island from the grassy plain, for their acute scent informs them that a tiger lies concealed in the thicket, but a few paces from their path.

It is a remarkable fact that the peacock and the tiger are so frequently seen together. The voice of the bird is seldom heard during the daytime, but as soon as the shades of evening begin to veil the landscape, his loud and disagreeable screams awaken the echoes, announcing, as the Javanese say, that the tiger is setting forth on his murderous excursions. Then the traveller carefully bolts the door of his hut, and the solitary Javanese retreats to his palisaded dwelling, for the tyrant of the wilderness is abroad. At night his dreadful roar is heard, sometimes accompanied by the peacock's discordant voice. Even in the villages, thinly scattered among the grass or along-wilds of Java, there is no security against his attacks, in spite of the strong fences with which they are enclosed, and the watch-fires carefully kept burning between these and the huts.

India, South China, Sumatra, and Java are the chief seats of the tiger, who is unknown both in Ceylon and Borneo, while to the north he ranges as far as Mandschuria and the Upper Obi, and Jennisei ( $55^{\circ}$ — $56^{\circ}$  N. lat.). A species of tiger identical with that of Bengal is common in the neighbourhood of Lake Aral, near Sussac ( $45^{\circ}$  N. lat.), and Tennent mentions that he is found among the snows of Mount Ararat in Armenia. As Hindostan is separated from these northern tiger haunts by the

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TIGER.



great mountain chains of Kuen-Lun ( $35^{\circ}$  N.), and of Mouztagh ( $42^{\circ}$  N. lat.), each covered with perpetual snows, mere summer excursions are quite out of the question, and it is evident that the animal is able to live in a much more rigorous climate than is commonly imagined. Even in India the tiger is by no means confined to the sultry jungle, for we learn from Mr. Hodgson's account of the mammalia of Nepal, that in the Himalayas he is sometimes found at the very edge of perpetual snow.

Tiger-hunting is a chief pleasure of the Indian rajahs and zemindars, who, anxious that their favourite amusement may suffer no diminution, forbid anyone else to chase on their domains, however much their poor vassals may have to suffer in consequence. But the delight they take in tiger-shooting never leads these cautious Nimrods so far as to endanger their precious persons. On some trees of the jungle a scaffolding is prepared, at a ludicrous height, for his Highness, who, at the appointed hour, makes his appearance with all the pomp of a petty Asiatic despot. The beating now begins, and is executed by a troop of miserable peasants, who most unwillingly submit to this forced and unpaid labour, which is the more dangerous for them as they are dispersed on a long line, instead of forming a troop, the only way to secure them against the attacks of the tiger. Thus they advance with a dreadful noise of drums, horns, and pistol-firing, driving the wild beasts of the jungle towards the scaffolding of their lord and master. At first the tigers, startled from their slumbers, retreat before them, but generally on approaching the scaffolding they guess the danger that awaits them and turn with a formidable growl upon the drivers. Sometimes, however, they summon resolution to rush with a few tremendous bounds through the perilous pass, and their flight is but rarely impeded by the ill-aimed shots of the ambuscade. Nevertheless, great compliments are paid to the noble sportsman for his ability and courage, and nobody says a word about the poor low-born wretches that may have been killed or mutilated by the infuriated brutes.

Our English tiger-hunters generally proceed on a very different plan. Provided with very excellent double-barrelled rifles, and accompanied by a troop of well-armed, well-paid drivers, and a number of courageous dogs, they boldly enter the jungle to rouse the tiger from his lair. In front of the party generally marches the shikarree, or chief driver, who attentively recon-

noitring the traces of the animal, points out the direction that is to be followed. On his right and left hand walk the English sportsmen, fully prepared for action, and behind them the most trustworthy of their followers, with loaded rifles ready for an exchange with those that have been discharged. Then follows the music, consisting of four or five tambourins, a great drum, cymbals, horns, a bell, and the repeated firing of pistols, and convoyed by men armed with swords and long halberds. A few slingsmen make up the rear, who arē constantly throwing stones into the jungle over the heads of the foremost of the party, and even more effectually than the noise of the music drive the tiger from his lair. From time to time, one of the men climbs upon the summit of a tree, to observe the movements of the grass. The whole troop constantly forms a close body. The tiger in cold blood is never able to attack a company that announces itself in so turbulent a manner. If he ventures, it is only with half a heart; he hesitates, stops at a short distance, and gives the hunter time to salute him with a bullet.

The tiger is particularly fond of dense willow or bamboo bushes on swampy ground, as he there finds the cool shade he requires for his rest during the heat of the day, after his nocturnal excursions. It is then very difficult to detect him, but the other inhabitants of the jungle, particularly the peacock and the monkey, betray his presence. The scream of the former is an infallible sign that the tiger is rising from his lair; and the monkeys, who during the night are frequently surprised by the panther or the boa, never allow their watchfulness to be at fault during the day. They are never deceived in the animal which slinks into the thicket. If it is a deer or a wild boar, they remain perfectly quiet, but if it is a tiger or a panther, they utter a cry designed to warn their comrades of the approach of danger. When, on examining a jungle, the traveller sees a monkey quietly seated on the branches, he may be perfectly sure that no dangerous animal is lurking in the thicket.



JACKAL.

During the night the cry of the jackal frequently announces the tiger's presence. When one of these vile animals is no longer able to hunt from age, or when he has been expelled from his troop, he is said to become the provider of the tiger, who, after having satiated

himself on the spoil, leaves the remains to his famished scout.

The tiger, who on the declivities of the Himalayas tears to pieces the swift-footed antelope, lacerates on the desert sand coasts of Java the tardy tortoise, when at nightfall it leaves the sea to lay its eggs in the drift-sand at the foot of the dunes. 'Hundreds of tortoise skeletons lie scattered about the strand, many of them five feet long and three feet broad; some bleached by time, others still fresh and bleeding. High in the air a number of birds of prey wheel about, scared by the traveller's approach. Here is the place where the turtles are attacked by the wild dogs. In packs of from twenty to fifty, the growling rabble assail the poor sea animal at every accessible point, gnaw and tug at the feet and at the head, and succeed by united efforts in turning the huge creature upon its back. Then the abdominal scales are torn off, and the ravenous dogs hold a bloody meal on the flesh, intestines, and eggs of their defenceless prey. Sometimes, however, the turtle escapes their rage, and dragging its lacerating tormentors along with it, succeeds in regaining the friendly sea. Nor do the dogs always enjoy an undisturbed repast; often during the night, the "lord of the wilderness," the royal tiger, bursts out of the forest, pauses for a moment, casts a glance over the strand, approaches slowly, and then with one bound, accompanied by a terrific roar, springs among the dogs, scattering the howling band like chaff before the wind. And now it is the tiger's turn to feast; but even he, though rarely, is sometimes disturbed by man. Thus on this lonely, melancholy coast, wild dogs and tigers wage an unequal war with the inhabitants of the ocean.'\*

After the tiger and the lion, the Panther and the Leopard are the mightiest felidæ of the Old World. Although differently spotted, the ocelli or rounded marks on the panther being larger and more distinctly formed, they are probably only varieties of one and the same species, as many intermediate individuals have been observed.

Both animals are widely diffused through the tropical regions of the Old World, being natives of Africa, Persia, China, India,

\* 'The Sea and its Living Wonders,' p. 154.

and many of the Indian islands; so that they have a much more extensive range than either the tiger or the lion. The manner in which they seize their prey, lurking near the sides of woods, and darting forward with a sudden spring, resembles that of the tiger; and the chase of the panther is said to be more dangerous than that of the lion, as it easily climbs the trees and pursues its enemy upon the branches.

The Cheetah, or hunting leopard (*Gueparda jubata, guttata*), which inhabits the greater part both of Asia and Africa, exhibits in its form and habits a mixture of the feline and canine tribes. Resembling the panther by its spotted skin, it is more elevated on its legs and less flattened on the fore part of its head. Its brain is more ample, and its claws touch the ground while walking, like those of the dog, which it resembles still further by its mild and docile nature. In India and Persia, where the Cheetahs are employed in the chase, they are carried, chained and hoodwinked, to the field in low cars. When the hunters come within view of a herd of antelopes, the Cheetah is liberated, and the game is pointed out to him: he does not, however, immediately dash forward in pursuit, but steals along cautiously till he has nearly approached the herd unseen, when, with a few rapid and vigorous bounds, he darts on the timid game and strangles it almost instantaneously. Should he, however, fail in his first efforts and miss his prey, he attempts no pursuit, but returns to the call of his master, evidently disappointed, and generally almost breathless.

The same radical differences which draw so wide a line of demarcation between the monkeys of the Old and the New World are found also to distinguish the feline races of both hemispheres, so that it would be as vain to search in the American forests and savannahs for the Numidian lion, or the striped tiger, as on the banks of the Ganges or the Senegal for the tawny puma, or the spotted jaguar. While in the African plains the swift-footed springbok falls under the impetuous bound of the panther—or while the tiger and the buffalo engage in mortal combat in the Indian jungle—the bloodthirsty Jaguar, concealed in the high grass of the American llanos, lies in wait for the wild horse or the passing steer.

The arrival of the Spaniards in the New World, so destructive to most of the Indian tribes with whom they came into contact,

was beneficial at least to the large felidæ of tropical America, for they first introduced the horse and the ox into the western hemisphere, where these useful animals, finding a new and congenial home in the boundless savannahs and pampas which extend almost uninterruptedly from the Apure to Patagonia, have multiplied to an incredible extent. Since then the jaguar no longer considers the deer of the woods, the graceful agouti, or the slow capybara as his chief prey, but rejoices in the blood of the steed or ox, and is much more commonly met with in the herd-teeming savannahs than in the comparatively meagre hunting-grounds of the forest.

Of all the carnivora of the New World, perhaps with the sole exception of the grisly and the polar bears, the tyrants of the North American solitudes, the Jaguar is the most formidable, resembling the panther by his spotted skin, but almost equalling the Bengal tiger in size and power. He roams about at all times of the day, swims over broad rivers, and even in the water proves a most dangerous foe, for when driven to extremities he frequently turns against the boat, and forces his assailants to seek their safety by jumping overboard. Many an Indian, while wandering through thinly populated districts, where swampy thickets alternate with open grass plains, has been torn to pieces by the jaguar, and in many a lonely plantation the inhabitants hardly venture to leave their enclosures after sunset, for fear of his attacks. During Tschudi's sojourn in Northern Peru, a jaguar penetrated into the hut of an Englishman who had settled in those parts, and dragging a boy of ten years out of his hammock, tore him to pieces and devoured him. Far from being afraid of man, this ferocious animal springs upon him when alone, and when pressed by hunger will even venture during the daytime into the mountain villages to seek its prey.

The chase of the jaguar requires great caution, yet keen sportsmen will venture, single-handed, to seek the jaguar in his lair, armed with a blow-pipe and poisoned arrows, or merely with a long and powerful lance. The praise which is due to the bold adventurers for their courage is, however, too often tarnished by their cruelty. Thus, a famous jaguar-hunter once showed Pöppig a large cavity under the tangled roots of a giant bombax-tree, where he had some time back discovered a female

jaguar with her young. Dexterously rolling down a large stone, he closed the entrance, and then with fiendish delight slowly smoked the animals to death, by applying fire from time to time to their dungeon. Having lost one-half of his scalp in a previous conflict with a jaguar, he pleaded his sufferings as an excuse for his barbarity.

To attack these creatures with a lance, a sure arm, a cool determined courage, and great bodily strength and dexterity are required; but even these qualities do not always ensure success if the hunter is unacquainted with the artifices of the animal. The jaguar generally waits for the attack in a sitting posture, turning one side towards the assailant, and, as if unconcerned, moves his long tail to and fro. The hunter, carefully observing the eye of his adversary, repeatedly menaces him with slight thrusts of his lance, which a gentle stroke of the paw playfully wards off; then seizing a favourable moment, he suddenly steps forward and plunges his weapon into his side. If the thrust be well aimed, a second is not necessary, for pressing with his full weight on the lance, the huntsman enlarges and deepens the mortal wound. But if the stroke is parried or glances off, the jaguar, roused to fury, bounds on his aggressor, and fells him to the ground with a stroke of his paw. Having his enemy now fully in his power, the jaguar looks at him quietly for a few moments as if enjoying his pangs, like a cat playing with a mouse, and this short delay has not seldom enabled the companion of the unfortunate hunter to save his life by a timely shot.

All those that have escaped from one of these death-struggles affirm that the breath of the enraged animal is of a suffocating heat, with a smell like that of burning capsicum, and that its pestilential contact produces an inflammation of the throat, which lasts for several days. Those who are less inclined to desperate conflicts destroy the jaguar by poisoned pieces of meat, or else they lay pitfalls for him, when they kill him without running any personal risk. Like the cayman, the jaguar, after having once tasted the flesh of man, is said to prefer it to anything else. During his first solitary journeys through the American wilds, the traveller's sensations, on meeting with the fresh footmarks of the monster, are like those of Robinson Crusoe when he discovered the vestiges of the savage on the beach of his lonely

island ; but as the animal itself very rarely crosses the wanderer's path, he at length becomes completely indifferent, and roams about the wilderness as unconcerned as if no beasts of prey existed under the forest shade, or among the high grasses of the savannah. During his long residence in Yuarmangua, Pöppig met but one jaguar, who, not deeming it advisable to engage in hostilities, slowly retreated into the woods.

In the Brazilian campos great devastations are caused among the herds by the jaguar, who has strength enough to drag an ox to some distance. He frequently kills several bullocks in one night, and sucks their blood, leaving their flesh for a future repast. When, after having satiated himself, he retires to a neighbouring thicket, the vaqueros or herdsmen follow his bloody trail with their hounds ; and as soon as the jaguar sees the pack approach, he seeks to climb the inclined trunk of a tree, and is then shot down from his insecure station. But the chase does not always terminate without accident or loss of life, as very strong jaguars will face the dogs, kill several of them, and frequently carry them away and devour them.

While Prince Maximilian of Neu Wied was travelling through the campos, he heard of the heroic conflict of three vaqueros with a monstrous jaguar that had never been known to retreat. One day, while following their herds through the woods, their dogs discovered the fresh foot-prints of the beast, and following the scent, soon brought it to a stand. Armed merely with their long lance-like *varas*, the bold men did not long deliberate, but resolutely advanced towards the jaguar, who stood confronting the dogs, and immediately bounding upon his new antagonists, wounded them one after the other, though not without receiving repeated thrusts of their lances and knives. The least determined of the three, appalled by his wounds, at first retreated, but seeing the boldest of his companions lying prostrate under the paws of the monster, his courage revived, and the attack being vigorously renewed, the jaguar was at length killed. The bleeding and exhausted heroes were hardly able to crawl home in the evening. They pointed out the spot where they had fought, and where the jaguar was found swimming in his blood, surrounded by the dogs which he had torn to pieces.

It is a general belief among the Indians and the white inhabitants of Bengal that the jaguar has the power of fascination. Many accounts are given to prove this; among others, a person informed Mr. Wallace that he had seen a jaguar standing at the foot of a high tree looking up into it. On the top was a howling monkey looking down at the jaguar, and jumping about from side to side, crying piteously. The jaguar stood still, the monkey continued descending lower and lower on the branches, still uttering its cries, till at length it fell down at the very feet of the jaguar, who seized and devoured it.

There is a black variety of the jaguar, on whose dark skin the ring-formed spots are still visible, and which is said to surpass the common species in size and ferocity.

The Cougar, or the Puma, as he is called by the Indians, is far inferior to the jaguar in courage, and consequently far less dangerous to man. On account of his brownish-red colour and great size, being the largest felis of the new world, he has also been named the American lion, but he has neither the mane nor the noble bearing of the 'king of animals.' In spite of his strength he is of so cowardly a disposition that he invariably takes to flight at the approach of man, and consequently inspires no fear on being met with in the wilderness; while even the boldest hunter instinctively starts back when, winding through the forest, he suddenly sees the sparkling eye of the jaguar intently fixed upon him.

The puma has a much wider range than the jaguar, for while the latter reaches in South America only to the forty-fifth degree of latitude, and does not rove northwards beyond Sonora and New Mexico, the former roams from the Straits of Magellan to the Canadian lakes. The jaguar seldom ascends the mountains to a greater height than 3,000 feet, while in the warmer lateral valleys of the Andes the puma frequently lies in ambush for the vicuñas at an elevation of 10,000 feet above the level of the sea. He can climb trees with great facility, ascending even vertical trunks, and, like the lynx, will watch the opportunity of springing on such animals as happen to pass beneath. No less cruel than cowardly, he will destroy without necessity forty or fifty sheep when the occasion offers, and content himself with licking the blood of his victims. When caught young, he is easily tamed, and, like the common cat, shows his

fondness at being caressed by the same kind of gentle purrings. Tschudi informs us that the Indians of the northern provinces frequently bring pumas to Lima, to show them for money. They either lead them by a rope, or carry them in a sack upon their back, until the sight-seers have assembled in sufficient number.

Besides the puma or the jaguar, tropical America possesses the beautifully variegated Ocelot (*Felis pardalis*); the Oscollo (*F. celidogaster*); the spotless, black-grey Jaguarundi (*F. jaguarundi*), which is not much larger than the European wild cat; the long-tailed, striped, and spotted Margay or Tiger-cat, and several other felidæ. All these smaller species hardly ever become dangerous to man, but they cause the death of many an agouti and cavy; and, with prodigious leaps, the affrighted monkey flies from their approach into the deepest recesses of the forest.

While the sanguinary felidæ may justly be called the eagles, the carrion-feeding Hyænas are the vultures, among the four-footed animals. Averse to the light of day, like the owl and the bat, they conceal themselves in dark caverns, ruins, or burrows, as long as the sun stands above the horizon, but at nightfall they come forth from their gloomy retreats with a lamentable howl or a satanic laugh, to seek their disgusting food on the fields, in churchyards, or on the borders of the sea. From the prodigious strength of their jaws and their teeth, they are not only able to masticate tendons, but to crush cartilages and bones; so that carcasses almost entirely deprived of flesh still provide them with a plentiful banquet.

Though their nocturnal habits and savage aspect have rendered them an object of hatred and disgust to man, they seem destined to fill up an important station in the economy of Nature, by cleansing the earth of the remains of dead animals, which might otherwise infect the atmosphere with pestilential effluvia.

Among other fabulous qualities, a courage has been attributed to the hyæna which is completely alien to his base and grovelling nature. Far from venturing to attack the panther, or putting even the lion to flight, as Kämpfer pretended to have seen, he is in reality a most pusillanimous creature, and cautiously avoids a contest with animals much weaker than himself.

Although his jaws are strong, he has not the sharp retractile claws of the felidæ, nor their formidable spring, his hind legs being comparatively feeble, and thus he can hardly become dangerous to the herds, though Bruce assures us that the hyænas destroyed many of his mules and asses.

In Barbary, the Arabs pursue the hyænas on horseback, and run them down with their greyhounds, never thinking of wasting their powder on so abject a game. They are held in such contempt that huntsmen will fearlessly penetrate into the caverns where they are known to sojourn, first carefully stopping the opening with their burnous, to keep out the light of day. They then advance towards the snarling brute, address it in menacing language, seize and gag it, without its venturing upon the least resistance, and cudgel the animal out of the den. The rough and ugly hide of the hyæna is but of little value, and in many tents its sight is not even tolerated, as if so unworthy a spoil could only bring misfortune to its owner.

The intractability of the hyæna is as fabulous as his courage or his cruelty. On the contrary, he is very easily tamed, and may be rendered as docile as the dog himself.

The striped hyæna is a native of Asiatic Turkey, Syria, and North Africa as far as the Senegal, while the spotted hyæna ranges over South Africa, from the Cape to Abyssiniâ. Both species attain the size of the wolf, and have similar habits. As the shark follows the ship, or the crow the caravan, they are said to hover about the march of armies, as if taught by instinct that they have to expect the richest feast from the insanity of man.

The moonlight falling on the dark cypresses and snow-white tombs of the Oriental churchyards not seldom shines upon hungry hyænas busily employed in tearing the newly-buried corpses from their graves.

A remarkable peculiarity of the spotted hyæna is that when he first begins to run he appears lame, so that one might almost fancy one of his legs was broken; but after a time this halting disappears, and he proceeds on his course very swiftly.

‘One night, in Maitsha,’ says Bruce, ‘being very intent on observation, I heard something pass behind me towards the bed, but upon looking round could perceive nothing. Having finished what I was then about, I went out of my tent, intending

directly to return, which I immediately did, when I perceived large blue eyes glaring at me in the dark. I called upon my servant for a light, and there was a hyæna standing nigh the head of the bed, with two or three large bunches of candles in his mouth. To have fired at him, I was in danger of breaking my quadrant or other furniture; and he seemed, by keeping the candles steadily in his mouth, to wish for no other prey at that time. As his mouth was full, and he had no claws to tear with, I was not afraid of him, but with a pike struck him as near the heart as I could judge. It was not till then he showed any sign of fierceness, but upon feeling his wound he let drop the candles and endeavoured to run up the shaft of the spear to arrive at me, so that in self-defence I was obliged to draw a pistol from my girdle and shoot him, and nearly at the same time my servant cleft his skull with a battle-axe.'

The *brown* hyæna, which is found in South Africa, from the Cape to Mozambique and Senegambia, and has a more shaggy fur than the preceding species, has very different habits. He is particularly fond of the crustacea which the ebbing flood leaves behind upon the beach, or which the storm casts ashore in great quantities, and exclusively inhabits the coasts, where he is known under the name of the sea-shore wolf. His traces are everywhere to be met with on the strand, and night after night he prowls along the margin of the water, carefully examining the refuse of the retreating ocean.

## CHAPTER XXXVI.

## THE AUSTRALIAN RACE.

Physical Conformation of the Australians—Their Low State of Civilisation—Their Superstitions—Their Wars—Singing and Dancing—The Corribory—Division of the Nation into Great Families—Rules regulating the Property of Land and the Distribution of Food—Skill in Hunting the Kangaroo and the Opossum—Feasting on a Whale—Moral Qualities and Intelligence of the Australians.

ON turning from the Malayan Archipelago and New Guinea, to the wilds of northern Australia, new aspects of savage life rise before our view. With new plants and new animals, a new variety of the human race makes its appearance, differing in figure, in physiognomy, in language, and in many of its customs and manners both from the Malay and the Papuan: a race which, though occupying one of the lowest grades in the scale of humanity, still offers many points of interest to the observer, and claims our attention both by its qualities and its defects.

The figure of the Australians is remarkable for spareness and lankness about the lower extremities, the hips and thighs as well as the calves of the legs, observable in the females as well as in the men. Their heads are in general large, with very projecting eyebrows and deep-set eyes, the nose broad, the mouth wide; and there is very often a ferocious look which is not in accordance with the character of the individual. The hair is often matted and twisted with filth and grease into different fashions; when clean, however, it is frequently as fine and glossy as that of the European. Its colour is in some of the children of a sunburnt brown, but invariably black among the adults. In their skins they vary from a dark chocolate-brown to an almost perfect black. Their hands and feet are

usually small and well-shaped ; the shoulders and chests of the men broad, and sufficiently muscular. Such is the physical character of the race from one end of the continent to the other, and though there are deviations from the usual slim and under-fed condition of the body, and from the usual straight character of the hair, the face, figure, and expression of an Australian is so peculiar as to distinguish him at once from the inhabitants even of the immediately adjacent islands.

In all the industrial arts these people are extremely deficient. They are utterly destitute of agriculture, and of all manufacture of any kind of material, or tool, or implement, beyond their few weapons and a rude stone hammer, and some simple nets and baskets. Over the largest part of the coast they were utterly ignorant of any kind of canoe until they were visited by Europeans ; and where most advanced in navigation, knew no other method of crossing the water than in rude boats formed of a sheet of bark tied at the ends, or on rafts consisting of bundles of rushes or sticks. They have no huts worthy of the name, nor permanent habitations of any kind. Men and women are alike naked, except that in the southern parts of Australia they wear a kind of rug of opossum skins over their shoulders during the cold weather. Many tribes strike out one or two front teeth, and raise great scars and cicatrices on the skin. They also paint themselves with various colours, like most other savages, and sometimes also ornament themselves with beads and shells, but make no use of the beautiful feathers procurable from the birds of the country.

Their languages, although showing evident traces of a common origin, yet vary so much and so frequently that a native of one tribe can rarely understand the tongue of another fifty miles distant. Their religious notions are limited to a feeling of vague superstition. They are in great dread of an evil being whom they describe as going about under the form of a black man, of superhuman stature and strength. He prowls at night through the woods around the encampments of the natives, seeking to entrap some unwary wanderer, whom he will seize upon, and having dragged him to his fire, will there roast and devour him. He may, however, be frightened away, by throwing fire at him, and no native will go out at night without a firebrand to protect him from this demon.

They have also a superstitious horror of approaching the graves of the dead, of whom they never like to speak, and when induced to do so, always whisper.

The supposed powers of the Boylyas, or native sorcerers, have a mighty influence upon their minds and actions. It is supposed that these privileged personages can transport themselves through the air at pleasure, and render themselves invisible to all but other Boylyas. If they have a dislike to a native, they can kill him by stealing on him at night and consuming his flesh. Another Boylya has, however, the power of drawing them out, and curing the affected person by certain processes of disenchantment.

The absurd idea that no adult person dies a natural death reigns among the Australians as it does among many of the American, Malayan, and Negro tribes, and leads to the same baneful consequences. If a man perishes of disease his death is generally supposed to have been caused by some sorcerer of another tribe, and must be avenged on his murderer, or on some near relation of his.

This senseless belief, inspired by the demon of discord, is of course the source of frequent wars, and one of the causes which serve to maintain the native Australians in their state of barbarism. The aggrieved party, anxious for revenge, assembles its neighbours, to consult with them concerning the proper course to be pursued. The general opinion having been declared for war, a messenger is sent to announce their intention to the opposite party. These immediately assemble their friends and neighbours, and all prepare for the approaching battle. The two armies (usually from fifty to two hundred each) meet, and after a great deal of mutual vituperation, the combat commences. From their singular dexterity in avoiding or parrying the missiles of their adversaries, the engagement usually continues a long time without any fatal result. When a man is killed (and sometimes before) a cessation takes place; another scene of recrimination, abuse, and explanation ensues, and the affair commonly terminates. All hostility is now at an end, the two parties mix amicably together, bury the dead, and join in a general dance, for, like all other savage races, the Australians are very fond of singing and saltatorial displays. Their songs are short, containing generally only one or two

ideas repeated over and over again. Is a native in a towering passion, he sings to himself some such words as

‘I’ll spear his liver,  
I’ll spear his lights,  
I’ll spear his heart,’ &c., &c.

while he sharpens the weapon intended to execute his menace, and waxing more and more excited as he sings, quivers his spear in the air, and, furiously gesticulating, imitates the various incidents of a fight. His wives chime in from time to time with a line or two expressive of their contempt for the offender :

‘The bone-rumped,  
Long-shinned,  
Thin-thighed fellow.’

the bystanders applaud, and the savage, having fairly sung the wrath out of himself, assists in getting up a dance. Is a native afraid, he sings himself full of courage ; is he hungry, he sings ; if he is full (provided he is not so full as to be in a state of stupor), he sings more lustily than ever ; in fact, under all circumstances he finds aid and comfort from singing. The Australian songs are therefore naturally varied in their forms, but their concision conveys in the simplest manner the impulsive idea. By a song or wild chant the women irritate the men to acts of vengeance, and four or five mischievously-inclined old women can soon stir up forty or fifty men to any deed of blood by means of their chants, which are accompanied by tears and groans, until the men are worked into a perfect state of frenzy.

Among the native dances, the Corribory is the most remarkable. It is always performed at night, by the light of blazing boughs, to time beaten on a stretched skin. The dancers are all painted white, and in such remarkably varied ways that not two are alike. Darkness seems essential to the performance of a corribory, and the white figures coming forward in mystic order from an obscure background, while the singers and the beaters of drums are invisible, produce a highly theatrical effect. At first, two persons make their appearance, slowly moving their arms and legs ; then others one by one join in, each imperceptibly warming into the truly savage attitude of

the corribory jump; the legs then stride to the utmost, the head is turned over one shoulder, the eyes glare and are fixed with savage energy all in one direction, the arms also are raised and inclined towards the head, and the hands usually grasp the boomerang or some other warlike weapon. The jump now keeps time with each beat, the dancers at every movement taking six inches to one side, all being in a connected line led by the first. The line is sometimes doubled and trebled, according to the space and to the number of the performers, and this produces a great effect, for when the front line jumps to the left the second jumps to the right, and thus this strange savage dance goes on with increasing intensity, until it suddenly and instantaneously stops, having attained the highest pitch of vivacity.

One of the most remarkable facts connected with the Australians is their division into certain great families, such as the Ballaroke, the Tolondarup, the Ngotock, &c., all the members of which bear the same names. These family names are perpetuated and spread through the country by the operation of two remarkable laws—that a man cannot marry a woman of his own family name, and that children of either sex always take the family name of their mother.

Each family adopts some animal or plant as its *Kobong*, or badge, and none of its members will kill an animal or pluck any plant of the species to which its *Kobong* belongs, except under particular circumstances.

The ceremony of marriage, which among most nations is considered so important and interesting, is with this people one of the least regarded. The woman is looked upon as an article of property, and is sold or given away by her relatives without the slightest consideration of her own pleasure. When a native dies, his brother inherits his wives and children, but his brother must be of the same family name as himself.

The old men manage to keep the females a good deal among themselves, giving their daughters to one another; and the more female children they have, the greater is their chance of getting another wife by this sort of exchange.

A most remarkable law is that which obliges families connected by blood upon the female side to join for the purpose of avenging crimes, and as the father marries several wives, and

very often all of different families, his children are all repeatedly divided among themselves, no common bond of union exists between them, and this custom alone would suffice to perpetuate their savage state.

Though they in no instance cultivate the soil, but subsist entirely by hunting and fishing, and on the wild roots they find in certain localities, with occasionally a little wild honey, every tribe has its own district, beyond whose well-defined limits it seldom passes except for purposes of war or festivity; and within that district all the wild animals are considered the property of the tribe inhabiting or rather ranging on its whole extent. Should any other tribe venture to intrude upon that district this is at once resisted as a violation of the rights of property, and is, indeed, a frequent cause of the wars which decimate the population, for the Australian aboriginal is as jealous of his rights and as pugnacious in their defence as any European can be.

But particular districts are not merely the property of particular tribes, particular sections or portions of these districts are universally recognised by the natives as belonging to individual members of these tribes; and as in England a man disposes of his property by will, thus among these savages a 'lord of the manor' divides his land during his lifetime, fairly apportioning it among his several sons, and at as early an age as fourteen or fifteen they can point out the portion which they are eventually to inherit. The punishment of 'trespass for the purpose of hunting' is invariably death if taken in the fact, and at the very least an obstinate contest ensues. If the trespasser is not taken in the fact, but is recognised from his footmarks, or from any other circumstance, and is ever caught in a defenceless state, he is probably killed; but frequently he appears, attended by his friends, and atones for his trespass by quietly holding out his leg for the injured party to thrust his spear through the thigh. Sometimes he undergoes the ordeal of having spears thrown at him.

At the appointed time, young and old repair to the place appointed for the trial, and the wild beauty of the scenery, the fantastically-painted forms of the natives, the savage yells and shouts of exultation which are raised as the culprit dexterously parries or by rapid leaps and contortions of his body avoids the

clouds of spears which are hurled at him, all combine to form a scene full of dramatic interest. If the criminal is wounded in a degree judged sufficient for the crime he has committed, his guilt is wiped away, or if none of the spears thrown at him (only a limited number being allowed to each) take effect, he is equally pardoned.

There are other laws intended for the preservation and distribution of food, such as that which forbids all vegetable productions used as such by the natives, to be plucked or gathered when bearing seed, and the restriction of youth to certain articles of diet. They are not allowed to eat fish or eggs, or the emu, or any of the finer kinds of opossum or kangaroo. In short, their fare is required to be of the coarsest and most meagre description. As they grow older the restrictions are removed one after another; but it is not till they have passed the period of middle age that they are entirely unrestrained in the choice of food. The result of this regulation is to prevent the young men from possessing themselves by their superior strength and agility of all the more desirable articles of food, and leaving only the refuse to the elders, to whom another rule requires them to pay implicit obedience.

Thus, while among most other savage nations old age is a period of privation and neglect, aged men are always treated by the Australians with great respect, and as they rarely take part in any fray, and seldom appear to suffer much from the infirmities and diseases to which the aged are generally subject amongst us, it is probably the happiest time of their life.

It is commonly supposed that the natives of Australia are about as badly off for food as the African Bushmen or the Fuegians, but according to Captain Grey, this is a great mistake, for every native knows exactly what his district produces, the proper time at which the several articles are in season, and the readiest means of procuring them. Besides, he is pre-eminently omnivorous, including frogs, mice, grubs, and lizards in his bill of fare, and making the roots of the earth, the fishes of the water, the birds of the air, and the animals of the bush contribute to his support. In order to obtain all the different articles of food, he displays a wonderful ingenuity, and never appears to greater advantage than while busily engaged in the pursuits of the chase. When hunting the kangaroo, he

rivals in energy and perseverance, in skill and keenness of eye, the Red Indian tracking the wild animals of the Brazilian forest. The moment he commences his day's hunting, his whole manner and appearance undergo a remarkable change; his eyes, before heavy and listless, are now full of animation; his movements are rapid but noiseless, all his soul is intent upon detecting signs of game. His glance roves from side to side in a vigilant, uneasy manner; no circumstance, however insignificant, escapes his attention—suddenly, he checks his pace, and stands immovable, like one transfixed, whilst all his faculties are concentrated in the sense of sight and hearing. His wives, who are at some distance behind him, the moment they see him assume this attitude, know that a kangaroo is near, and fall to the ground as if they had been shot, their children cowering by them and their little faces expressing an earnestness and anxiousness far beyond their years.

‘Looking about a hundred yards to the right of the native, you will see a kangaroo erect upon its hind legs and supported by its tail; it is reared to its utmost height, so that its head is between five and six feet above the ground; its short fore-paws hang by its side, its ears are pointed: it is listening as carefully as the native, and you see a little head peering out from its pouch, to inquire what has alarmed its mother; but the native moves not, you cannot tell whether it is a human being or the charred trunk of a burnt tree which is before you, and for several minutes the whole group preserve their relative position; at length the kangaroo becomes reassured, drops upon its fore paws, gives an awkward leap or two, and goes on feeding. Meantime the native moves not until the kangaroo having two or three times resumed the attitude of listening, at length once more abandons itself in perfect security to its feed, and playfully smells and rubs its little one. Now the watchful savage, keeping his body unmoved, fixes the spear first in the throwing-stick and then raises his arms in the attitude of throwing, from which they are never again moved until the kangaroo dies or runs away; his spear being properly secured he advances slowly and stealthily towards his prey, no part moving but his legs; whenever the kangaroo looks round, he stands motionless, in the position he is in when it first raises its head, until the animal, again assured of its safety,

gives a skip or two and goes on feeding again; the native advances, and this scene is repeated many times, until the whistling spear penetrates the devoted animal; then the wood rings with shouts, women and children all join pell-mell in the chase; the kangaroo, weak from the loss of blood, and embarrassed by the long spear, which catches in the brush wood as it flies, at length turns on its pursuers, and to secure its rear, places its back against a tree, preparing at the same time to rend open the breast and entrails of its pursuer, by seizing him in its fore-paws and kicking with its hind legs and claws; but the wily native keeps clear of so murderous an embrace, and from the distance of a few yards throws spears into its breast, until the exhausted animal drops down.'

There are several other modes of taking kangaroos, such as catching them in nets or pit-falls, or lying in wait near their watering places until they come to drink; or else a party surrounds and incloses them in a narrowing circle; but the mode of tracking a kangaroo until it is wearied out is the one which pre-eminently requires every qualification prized by savages,—skill in tracking, endurance of hunger and thirst, unwearied bodily exertion, and lasting perseverance. To perform this feat, a native starts upon the track of a kangaroo, which he follows until he sights it, when it flies timidly before him; again he pursues the track, and again the animal bounds from him, and this is repeated until nightfall, when the native lights his fire, and sleeps upon the track; with the first light of day the hunt is resumed, and towards the close of the second day, or in the course of the third, the kangaroo falls a victim to its pursuer. None but a skilful huntsman, in the pride of youth and vigour, can execute this feat, which beyond all others excites the admiration of the natives.

Unfortunately, my limits do not allow me to describe their dexterity in fishing, or in entrapping the various kinds of wild fowl with which the rivers and lagoons of Australia abound, but the skill and acuteness of perception they display in hunting the opossum are too interesting to be passed over in silence. The savage carelessly walks up to some narrow trunk which he thinks bears a suspicious appearance; his hands are placed thoughtlessly behind his back, whilst his dark eye glances over the bark; suddenly it is for one moment stationary, and he

looks eagerly at the tree, for he has detected the holes made by the nails of the opossum in its ascent; he now seeks for one of these footmarks which has a little sand attached to it, and gently blows the sand. If this is still damp, and holds together, it is a sign that the animal has climbed the tree the same morning, for otherwise the sand, dried by the heat of the sun, would have been readily swept away before his breath. Having, by this examination of signs which an unskilled European would vainly strive to detect, convinced himself that the opossum is in some hole of the tree, the native pulls his hatchet from his girdle, and cutting a small notch in the bark about four feet from the ground, he places the great toe of his right foot in it, throws his right arm round the tree, and with his left hand sticks the point handle of the hatchet into the bark, as high up as he can reach, and thus forms a stay to drag himself up with; having made good this step, he cuts another for his left foot, and thus proceeds until he has ascended to the hole where the opossum is hid, which is then compelled by smoke, or by being poked out, to quit its hiding-place, when the native catching hold of its tail, dashes it down on the ground, and quietly descends to pick it up.

The stranding of a whale is a great event in an Australian's life, for here without any trouble on his part the bountiful sea presents him with a whole mountain of flesh. It is impossible for civilised man to enter into the feelings of the savage under these circumstances, for he has never been similarly situated; he never has had such a prodigal repast placed at once before him. On finding a whale cast ashore upon his property, the native 'lord of the manor,' seeing the impossibility of his own family consuming this enormous mass of food, whatever zeal it may bring to the task, feels his breast glow with unwonted hospitality, and anxious to see his friends about him, falls to work with his wives, and kindles large fires to give notice of the joyful event. This duty being performed, he rubs himself all over with the blubber, then anoints his favourite wives, and thus prepared, begins cutting his way through the blubber into the flesh, the grain of which is about as firm as a goose-quill. By-and-by other natives come gaily trooping in from all quarters; by night they dance and sing, by day they eat and sleep, and continue gormandising and merry-making until

they at last fairly eat their way into the whale. Thus they remain by the carcase for many days, rubbed from head to foot with stinking blubber, gorged to repletion with putrid meat, out of temper from indigestion, and therefore constantly quarrelling, suffering from a cutaneous disorder by high feeding, and presenting altogether a most disgusting spectacle. A native girl stepping out of the carcase of a putrid whale is indeed a sight very different from that of a sea-born Venus emerging from her shell. When they at last quit their feast, they carry off as much as they can stagger under, to eat upon the way, and to take as a rare treat to their distant friends.

Though in many respects so utterly barbarous, the Australians are not guilty of the cannibalism so prevalent among the islanders of the Papuan race and in many parts of the Indian Archipelago, where, by a strange anomaly, we find it practised by nations standing much higher in the scale of civilisation.

The inventions of the throwing-stick for darting the spear, and of the well-known weapon called the boomerang ; the sound policy of many of their laws and regulations, and the fact that Australian children educated in England have shown the same aptitude in learning as white children of the same age, sufficiently prove that these savages are by no means deficient in intelligence.

As to their moral qualities, their apparent honesty results in a great measure from there being few European articles for which they have any use ; articles of food, or a knife, or a hatchet are by no means safe where they can get at them. Their behaviour to their women is often very bad ; they beat and even spear them on the most trifling occasions. Different tribes vary in the most extraordinary way in their friendliness or hostility to strangers. They appear to be very capricious, and always act on the whim or the impulse of the moment, so that the same people, who to-day may be kind assistants in the hour of need, will to-morrow be guilty of the grossest acts of treachery.

## CHAPTER XXXVII.

## THE SLOTH.

Miserable Aspect of the Sloth—His Beautiful Organisation for his Peculiar Mode of Life—His Rapid Movements in the Trees—His Means of Defence—His Tenacity of Life—Fable about the Sloth refuted—The Ai—The Unau—The Mylodon Robustus.

‘THE piteous aspect, the sorrowful gestures, the lamentable cry of the Sloth, all combine to excite commiseration.



THE SLOTH.

While other animals assemble in herds, or roam in pairs through the boundless forest, the sloth leads a lonely life in those immeasurable solitudes, where the slowness of his movements exposes him to every attack. Harmless and frugal, like a pious anchorite, a few coarse leaves are all he asks for his support. On comparing him with other animals, you would say that his deformed organisation was a strange mixture of deficiency and superabundance. He has no cutting teeth, and though possessed of

four stomachs, he still wants the long intestines of ruminating animals. His feet are without soles, nor can he move his toes separately. His hair is coarse and wiry, and its dull colour reminds one of grass withered by the blasts of surly winter. His legs appear deformed by the manner in which they are attached to the body, and his claws seem disproportionably long. Surely a creature so wretched and ill-formed stands last on the list of all the four-footed animals, and may justly accuse Nature of step-motherly neglect!

When seeing a captured sloth painfully creeping along on even ground, sighing and moaning, and scarcely advancing a few steps after hours of awkward toil, the observer might well be

disposed to acquiesce in the foregoing remarks, and to fancy he had discovered a flaw among the general beauty of the Creator's works ; but let him view the animal in the situation for which it was ordained, and he will soon retract his hasty judgment, and discover it to be no less perfect in its kind, and no less admirably fitted for its sphere of existence, than the most highly organised of the mammalian tribes.

For the sloth, in his wild state, spends his whole life in the trees, and never once touches the earth but through force or by accident. Like the monkey, he has been formed for an exclusively sylvan life, high above the ground, in the green canopy of the woods ; but while the nimble simiæ constantly live *upon* the branches, the sloth is doomed to spend his whole life *under* them. He moves, he rests, he sleeps suspended from the boughs of trees, a wonderfully strange way of life, for which no other four-footed animal of the Old or the New World has been destined.

And now examine his organisation with reference to this peculiar mode of existence, and all his seeming deficiencies and deformities will appear most admirably adapted to his wants, for these strong, muscular, preposterously long fore-feet, while the hinder extremities are comparatively short and weak, these slender toes armed with enormous claws, are evidently as well suited for clasping the rugged branch as the enormous hind-legs of the kangaroo for bounding over the arid plain. Indeed, in every case, we shall find the fundamental type or idea of the four extremities belonging to the vertebrated animals most admirably modified according to their wants : here shortened, there prolonged : here armed with claws, there terminating in a hoof ; here coalescing to a tail, there assuming the shape of a fin ; here clothed with feathers to cleave the air, there raised to the perfection of the human hand, the wonderful instrument of a still more wonderful intelligence ; and who, seeing all this, can possibly believe that the world is ruled by chance, and not by an all-pervading and almighty power ?

Thus the sloth, so helpless when removed from his native haunts, is far from exhibiting the same torpidity in his movements when seen in the place for which Nature fitted him.

‘One day, as we were crossing the Essequibo,’ says Mr.

Waterton, 'I saw a large sloth on the ground upon the bank; how he had got there nobody could tell; the Indian said he had never surprised a sloth in such a situation before: he would hardly have come there to drink, for both above and below the place the branches of the trees touched the water, and afforded him an easy and safe access to it. Be this as it may, though the trees were not above twenty yards from him, he could not make his way through the sand time enough to escape before we landed. As soon as we came up to him, he threw himself upon his back, and defended himself in gallant style with his fore-legs. "Come, poor fellow!" said I to him, "if thou hast got into a hobble to-day, thou shalt not suffer for it; I'll take no advantage of thee in misfortune; the forest is large enough both for thee and me to rove in. Go thy ways up above, and enjoy thyself in these endless wilds; it is more than probable thou wilt never have another interview with man. So fare thee well." On saying this I took up a long stick which was lying there, held it for him to hook on, and then conveyed him to a high and stately mora. He ascended with wonderful rapidity, and in about a minute he was almost at the top of the tree. He now went off in a side direction, and caught hold of the branch of a neighbouring tree; he then proceeded towards the heart of the forest. I stood looking on, lost in amazement at his singular mode of progress. I followed him with my eye till the intervening branches closed in betwixt us, and then lost sight for ever of the sloth. I was going to add that I never saw a sloth take to his heels in such earnest, but the expression will not do, for the sloth has no heels.'

The Indians, to whom no one will deny the credit of being acute observers of animal life, say that the sloth wanders principally when the wind blows. In calm weather he remains still, probably not liking to cling to the brittle extremity of the branches, lest they should break under his weight in passing from one tree to another; but as soon as the breeze rises, the branches of the neighbouring trees become interwoven, and then he seizes hold of them and pursues his journey in safety. There is seldom an entire day of calm in the forests of Guiana. The trade-wind generally sets in about ten o'clock in the morning, and since the sloth, as we have just seen, is able to

travel at a good-round pace when he has branches to cling to, there is nothing to prevent him making a considerable way before the sun sinks, and the wind goes down.

During night, and while reposing in the daytime, the sloth constantly remains suspended by his feet, for his anatomy is such that he can feel comfortable in no other position. In this manner he will rest for hours together, expressing his satisfaction by a kind of purring, and from time to time his dismal voice may be heard resounding through the forest, and awakening at a distance a similar melancholy cry.

The colour of the sloth's hair so strongly resembles the hue of the moss which grows on the trees, that the European finds it very difficult to make him out when he is at rest, and even the falcon-eyed Indian, accustomed from his earliest infancy to note the slightest signs of forest life, is hardly able to distinguish him from the branches to which he clings. This no doubt serves him as a protection against the attacks of many enemies; but, far from being helpless, his powerful claws and the peculiarly enduring strength of his long arms, make very efficient weapons of defence against the large tree snakes that may be tempted to make a meal of him.

The sloth possesses a remarkable tenacity of life, and withstands the dreadful effects of the wourali poison of the Macushi Indians longer than any other animal. Schomburgk slightly scratched a sloth in the upper lip, and rubbed a minimum of the venom in the wound, which did not even emit a drop of blood; he then carried the animal to a tree, which it began to climb, but after having reached a height of about twelve feet, it suddenly stopped, and swinging its head about from side to side, as if uncertain which way to go, tried to continue its ascent, which, however, it was unable to accomplish. First it let go one of its fore-feet, then the other, and remained attached with its hind-legs to the tree until, these also losing their power, it fell to the ground, where, without any of the convulsive motions or the oppressive breathing which generally mark the effect of the wourali, it expired in the thirteenth minute after the poison had been administered.

The sloths attain a length of about two feet and a half, and form two genera—the *Unaus*, with two-toed fore-feet and

three-toed hinder extremities, and the Aïs, with three toes on each foot. Their way of living is the same, and their range is limited to the forests of Guiana and the Brazils. They bring forth and suckle their young like ordinary quadrupeds, and the young sloth, from the moment of its birth, adheres to the body of its parent till it acquires sufficient size and strength to shift for itself.



INDIAN PANGOLIN.

## CHAPTER XXXVIII.

### ANT-EATERS.

The Great Ant-Bear—His Way of Licking up Termites—His Formidable Weapons—A Perfect Forest Vagabond—His Peculiar Manner of Walking—The Smaller Ant-Eaters—The Manides—The African Aard Vark—The Armadillos—The Porcupine Ant-Eater of Australia.

**T**HE great Ant-bear is undoubtedly one of the most extraordinary denizens of the wilds of South America, for that a powerful animal, measuring above six feet from the snout to the end of the tail, should live exclusively on ants, seems scarcely less remarkable than that the whale nourishes his enormous body with minute pteropods and medusæ. The vast mouth of the leviathan of the seas has been most admirably adapted to his peculiar food, and it was not in vain that Nature gave such colossal dimensions to his head, as it was necessary to find room for a gigantic straining apparatus, in which, on rejecting the engulfed water, thousands upon thousands of

his tiny prey might remain entangled; but the ant-bear has been no less wonderfully armed for the capture of the minute animals on which he feeds, and if, on considering the use for which it was ordained, we become reconciled to the seeming disproportion of the whale's jaws, the small and elongated, snout-like head of the ant-bear will also appear less uncouthly formed when we reflect that it is in exact accordance with the wants of the animal. For here no deep cavity was required for the reception of two rows of powerful teeth, as in most other quadrupeds, but a convenient furrow for a long and extensile tongue—the use of which will immediately become apparent on following the animal into the Brazilian campos, where, as we have seen in a former chapter, the wonderful cities of the white ant are dispersed over the plains in such incalculable numbers. Approaching one of these structures, the ant-bear strikes a hole through its wall of clay, with his powerful crooked claws, and as the ants issue forth by thousands to resent the insult, stretches out his tongue for their reception. Their furious legions, eager for revenge, immediately rush upon it, and vainly endeavouring to pierce its thick skin with their mandibles, remain sticking to the glutinous liquid with which it is lubricated from two very large glands situated below its root. When sufficiently charged with prey, the ant-bear suddenly withdraws his tongue and swallows all the insects.

Without swiftness to enable him to escape from his enemies, for man is superior to him in speed; without teeth, the possession of which would assist him in self-defence; without the power of burrowing in the ground, by which he might conceal himself from his pursuers; without a cave to retire to, the ant-bear still ranges through the wilderness in perfect safety, and fears neither the boa nor the jaguar, for he has full reliance on his powerful fore-legs and their tremendous claws.

Richard Schomburgh had an opportunity of witnessing a young ant-bear make use of these formidable weapons. On the enemy's approach it assumed the defensive, but in such a manner as to make the boldest aggressor pause, for, resting on its left fore-foot, it struck out so desperately with its right paw as would undoubtedly have torn off the flesh of any one that came in contact with its claws. Attacked from behind, it

wheeled with the rapidity of lightning, and on being assailed from several quarters at once, threw itself on its back, and desperately fighting with its fore-legs, uttered at the same time an angry growl of defiance. In fact the ant-bear is so formidable an opponent that he is said not unfrequently to vanquish even the jaguar, the lord of the American forests, for the latter is often found swimming in his blood, with ripped-up bowels, a wound which, of all the beasts of the wilderness, the claws of the ant-bear are alone able to inflict.

On seizing an animal with these powerful weapons, he hugs it close to his body, and keeps it there till it dies through pressure or hunger. Nor does the ant-bear, in the meantime, suffer much from want of aliment, as it is a well known fact that he can remain longer without food than perhaps any other quadruped, so that there is very little chance indeed of a weaker animal's escaping from his clutches.

Peaceable and harmless, the ant-bear when unprovoked never thinks of attacking any other creature; and as his interests and pursuits do not interfere with those of the more formidable denizens of the wilderness, he would, without doubt, attain a good old age, and be allowed to die in peace, if, unfortunately for him, his delicate flesh did not provoke the attacks of the large carnivora and man. To be sure, the Indian fears his claws, and never ventures to approach the wounded ant-bear until he has breathed his last; nor can he be hunted with dogs, as his skin is of a texture that perfectly resists a bite, and his hinder parts are effectually protected by thick and shaggy hair; yet, armed with the wourali poison, the wild hunters know how to paralyse in a few minutes his muscular powers, and to stretch him dead upon the earth. They have also recourse to stratagem for the animal's destruction, for during rain it turns its long bushy tail up over its back and stands still. Knowing this, the Indians when they meet with one, rustle the leaves, and it thinks rain is falling, and turning up its tail, they take the opportunity of killing it by a blow on the head with a stick.

A perfect forest vagabond, the ant-bear has no den to retire to, nor any fixed abode; his immense tail is large enough to cover his whole body, and serves him as a tent during the night, or as a waterproof mantle against the rains of the wet

season, so that he might boast, like Diogenes, of carrying all he required about him.

The peculiar position of his paws, when he walks or stands, is worthy of notice. He goes entirely on the outer side of his fore-feet, which are quite bent inwards, the claws collected into a point and going under the foot. In this position he is quite at ease, while his long claws are disposed of in a manner to render them harmless to him, and are prevented from becoming dull and worn, which would inevitably be the case did their points come in actual contact with the ground, for they have not that retractile power which is given to animals of the feline race, enabling them to preserve the sharpness of their claws on the most flinty path. In consequence of its resting perpetually on the ground, the whole outer side of the foot is hard and callous, while, on the contrary, the inner side of the bottom of the foot is soft and hairy.

Besides the great ant-bear, there are two other species of American ant-eaters, one nearly the size of a fox, and the smallest not much larger than a rat. Being provided with prehensile tails, they are essentially arboreal, while the great ant-bear, incapable of climbing, always remains on the ground, where, thanks to the abundance of his prey, he is always sure of obtaining a sufficient supply of food, with very little trouble.

The Manides, and Pangolins, of South Africa and Asia, resemble the ant-eaters of America in having a very long extensible tongue, furnished with a glutinous mucus for securing their insect food, and in being destitute of teeth; but completely differ from them in having the whole body covered with a panoply of large imbricated scales, overlapping each other like those of the lizard tribes, and also in being able to roll themselves up when in danger, by which their trenchant scales become erect, and present a formidable defensive armour of wonderful hardness, so that even the tiger would vainly attempt to overcome the Indian Pangolin.

The manides are inoffensive animals, living wholly on ants and termites, and chiefly inhabit the most obscure parts of the forest, burrowing in the ground to a great depth, for which purpose, as also for extracting their food from ant-hills and decaying wood, their feet are armed with powerful claws, which they double up in walking, like the ant-bear of Brazil.

Besides several species of manides, Africa possesses a peculiar class of ant-eaters in the Aard varks, or Earth-hogs (*Orycteropi*), thus called from their extraordinary powers of excavation and their fancied resemblance to small short-legged pigs. Such is the strength of their prodigious claws that they easily tear to pieces the clay-built domes of the termites; which, though so solid as to be capable of bearing the weight



AARD VARK.

of many men on their summits, are unable to resist the destructive labours of the Aard vark. Towards evening the animal issues from its burrow, and roaming over the plains, searches for an ant-hill in full operation. A breach is soon made in the strong walls of the citadel, and as the unfortunate termites run hither and thither in consternation, like the inmates of a beleaguered city whose ramparts are crumbling under the

enemy's artillery, the author of this confusion flings his glutinous tongue among them and sweeps them into his mouth by hundreds. The Aard varks abound all over the sultry plains of torrid Africa, but owing to their great burrowing powers the capture of a living specimen is attended with the greatest difficulty; the claws being instruments of excavation with which the spade is unable to compete. Unless disturbed, however, and forced to dig deeper through fear of capture, the Aard vark, being averse to unnecessary trouble, makes but a shallow burrow—sufficiently deep, however, not seldom to cause the wheels of a waggon to sink into it, or to prove a treacherous pitfall to a hunter in full chase.

The American Armadillos have many points in common with the Manides. They have neither fore nor canine teeth, but a number of conical grinders, and are distinguished by having the upper parts of their bodies defended by a complete suit of armour, divided into joints or bands, folding one over the other like the parts of a lobster's tail, so as to accommodate themselves to all the motions of the animal. In life, this shell is very limber, so that the armadillo is able to go at full stretch, or to roll himself up into a ball as occasion may require. These animals are very common both in the forests and in the open plains of South America, where they reside in subterranean homes which they have dug with their powerful fore-limbs. They are seldom seen abroad during the day, and when surprised are sure to be near the mouth of their holes; but after sunset they sally forth in search of roots, grain, worms, insects, and other small animals, and when disturbed, coil themselves up in their armour like the hedgehog, or squat close to the ground, or escape by digging into the earth, a work which they perform with masterly dexterity. So fast indeed do they excavate that if a horseman sees one of these animals, he must almost tumble from his steed if he wishes to capture the active creature. And when he has seized it he must be cautious not to come into contact with its feet, or he will suffer severe wounds from the powerful claws with which they are armed.

The family of the armadillos has been subdivided into numerous genera and species, distinguished from each other by the number of their shelly bands, their teeth, and their toes. They might also be conveniently divided into two tribes, the

one with a long and conical tail, the other with a short caudal appendage, formed like a club. They differ greatly in size, for while the giant armadillo (*Priodontes gigas*) is at least four feet long from the tip of the snout to the tip of the tail, the Pichiciago (*Chlamyphorus truncatus*), which inhabits the province of Mendoza in the Andes, and is remarkable for its mole-like propensities, passing the greatest part of its life underground, scarcely measures six inches in length.



PICHICIAGO.

The curious Echidna, or Porcupine Ant-eater (*Echidna hystrix*) of Australia, is a striking instance of those beautiful gradations so frequently observed in the animal kingdom, by which creatures of various tribes or genera are blended as it were, or linked together, and of the wonderful diversity which Nature has introduced into the forms of



PORCUPINE ECHIDNA.

creatures destined to a similar mode of life. It has the general appearance and external coating of the porcupine, with the mouth and peculiar generic characters of the ant-

eaters. It is about a foot in length, and burrows with wonderful facility by means of its short muscular fore-feet and its sharp-pointed claws. When attacked, it rolls itself into a ball like the hedgehog, erecting the short, strong, and very sharp spines with which the upper parts of the body and tail are thickly coated, and thus presenting a formidable defensive armour to its assailant.



FLYING FOXES.

## CHAPTER XXXIX.

### TROPICAL BATS.

Wonderful Organisation of the Bats—The Fox-Bat—The Vampire—Its Blood-sucking Propensities—The Horse-Shoe Bats—The Flying Squirrel—The Galeopithecus—The Anomalurus.

**W**HEN the sun has disappeared below the horizon, and night falls on the landscape, which a little while ago was bathed in light, then from hollow trees, and creviced rocks, and ruined buildings, a strange and dismal race comes forth.

Silently hovering through the glades of the wood, or skimming along the surface of the streams, it catches the crepuscular or nocturnal moths, and serves like the swallow by day to check the exuberant multiplication of the insect tribes. But while man loves the swallow, and suffers him to build his nest under the eaves of his dwelling, he abhors the bat, which like an evil spirit avoids the light of day, and seems to feel happy only in darkness. The painter, expressing this general feeling, gives

to his angels the white pinions of the swan, while his demons are made to bear the black wings of the bat. And yet the bat, in Europe at least, is a most inoffensive creature, which may well claim the gratitude of the farmer, from the vast numbers of cockchafers and other noxious insects which it destroys; while a closer inspection of its wonderful organisation proves it to be far more deserving of admiration than of repugnance. Can anything be better adapted to its wants than the delicate membrane which, extending over the long slim fingers, can be spread and folded like an umbrella, so as to form a wing when the animal wishes to fly, and to collapse into a small space when it is at rest? How slight the bones, how light the body, how beautifully formed for flight!

Though temperate Europe possesses many bats, yet they are most numerous and various in the woody regions of the tropical zone, where the vast numbers of the insect tribes and forest fruits afford them a never-failing supply of food. There also they attain a size unknown in our latitudes, so that both from their dimensions and their physiognomy, many of the larger species have obtained the name of flying-dogs or flying-foxes.

On approaching a Javanese village, you will sometimes see a stately tree, from whose branches hundreds of large black fruits seem to be suspended. A strong smell of ammonia and a piping noise soon, however, convince you of your mistake, and a closer inspection proves them to be a large troop of Kalongs, or Flying-Foxes (*Pteropus*), attached head downwards to the tree, where they rest or sleep during the daytime, and which they generally quit at sunset, though some of them differ so much from the usual habits of the family as to fly about in the broad light of day.

Many species of fox-bats are found all over the torrid zone in the Old World, but they abound particularly in the East Indian Archipelago. They belong to the rare quadrupeds indigenous in some of the South Sea Islands, such as Tonga or Samoa, and extend northwards as far as Japan, and southwards to Van Diemen's Land. They occasion incalculable mischief in the plantations, devouring indiscriminately every kind of fruit; but, on the other hand, the gigantic kalong of Java (*Pteropus edulis*), whose body attains a length of a foot and a half, and whose outstretched wings measure no less than four

feet and a half from tip to tip, is eaten as a delicacy by the natives.

The same essential differences which we observe between the monkeys of both hemispheres, are also found to exist between the large bats of the Old and the New World. Not a single fox-bat is to be found in all America, while the *Phyllostomidæ*, distinguished by the orifices of their nostrils being placed in a kind of membranous scutcheon, surmounted by a leaf-like expansion, like the head of a lance, and supposed to extend in an extraordinary degree the sense of smelling, are exclusively confined to the western continent. These large bats of which there are many species, some measuring above two feet from wing to wing, are remarkable for their blood-sucking propensities, and under the name of vampires have brought the whole race of the large tropical bats into evil repute.

The *Phyllostomahastatum*, a common species on the Amazons, chiefly feeds on vespertine and nocturnal moths, but does also much injury to horses and cattle, and even attacks man when it has an opportunity. The Prince of Neu Wied often saw it by moonlight hovering about his horses while grazing after their day's journey. The animals did not seem incommoded by its attacks, but on the following morning he generally found them covered with blood from the shoulders to the hoofs. There is still some uncertainty as to the way in which it inflicts its wound, which is a small round hole, the bleeding of which it is very difficult to stop. It can hardly be a bite, as that would awake the sleeper; it seems most probable that it is either a succession of gentle scratches with the sharp edge of the teeth, gradually wearing away the skin, or a trituration with the point of the tongue till the same effect is produced. After the wound is made the muscular underlip of the vampire, which can be completely folded together in the shape of a sucking-tube, continues to pump forth the blood, the wings of the bat serving at the same time to fan the patient into a deeper slumber.

Many persons are particularly annoyed by the *Phyllostoma*, while others are free from their attacks. Mr. Wallace, who was himself twice bitten, once on the top of the great toe, the usual locality, and the other time on the top of the nose, mentions an old mulatto on the Upper Rio Negro, who was attacked

almost every night, and though there were frequently half a dozen other persons in the room, would be the favoured party. An Indian girl at Manaquery, on the Upper Amazon, who was likewise frequently annoyed by the bats, was at length so much weakened by loss of blood, that fears were entertained of her life if they continued their attacks, and it was found necessary to send her to a distance, where her bloodthirsty persecutors did not abound.

In the province of Minas Geraes innumerable troops of large bats issue from the limestone caverns on the banks of the Rio Francisco, or from the crevices of the granite walls of the Parime Mountains, and not seldom attack the cattle with such bloodthirsty obstinacy as to oblige the planters to drive their herds to some other part of the country. To keep them in check, tobacco and sulphur are from time to time ignited under the rocks where they abound, when the stunned bats drop down, and are killed by thousands.

The vampires may sometimes be seen in the forest, hanging in clusters, head downwards, from the branch of a tree, a circumstance of which Goldsmith seems to have been aware, for in the 'Deserted Village,' speaking of America, he says—

' And matted woods, where birds forget to sing,  
But silent bats in drowsy clusters cling.'

Some of the phyllostomidæ have a tongue once as long again as the head, and armed at the extremity with recurved bristles, like that of the woodpecker, no doubt a very serviceable instrument for extracting insects from the narrow hollows and crevices of trees and rocks.

The Rhinolophi, or Horse-shoe Bats, of the old continent, have also a more or less complicated nasal appendage, or foliaceous membrane at the end of the nose, but differ-



RHINOLOPHUS.

ing in its conformation from that of the phyllostomidæ.

They are insectivorous, like most of their order, and none of them seem to indulge in the blood-sucking propensities of the large American vampires. They chiefly inhabit the tropical regions of Africa and Asia, and more particularly the Indian Archipelago, but the *Rhinolophus unihastatus* ranges in Europe as far as England.

Numerous genera and species of tropical bats, distinguished from each other by the formation of their teeth, lips, nostrils, heads, wings, and tails, have already been classified by naturalists, but many, no doubt, still live unknown in their gloomy retreats, for who is able to follow them into the obscure nooks of the forest, or into intricate caverns, and accurately to observe them during their nocturnal rambles? It may give an idea of their vast numbers throughout the torrid zone, when we hear that in Ceylon alone about sixteen species have been identified, and of these, two varieties are peculiar to the island. Unlike the sombre bats of the northern climates, the colours of some of them are as brilliant as the plumage of a bird, bright yellow, deep orange, or of a rich ferruginous brown, thus contradicting the general belief which attires nocturnal animals in vestures as dark as their pursuits.

The torrid zone, which produces the largest bats, also gives birth to the tiniest representatives of the order, such as the minute Singhalese variety of *Scotophilus Coromandelicus*, which is not much larger than the humble bee, and of a glossy black colour. 'It is so familiar and gentle,' says Sir J. E. Tennent, 'that it will alight on the cloth during dinner, and manifests so little alarm that it seldom makes any effort to escape before a wine-glass can be inverted to secure it.'

Though incapable of a prolonged flight like the bats, several other tropical quadrupeds have been provided with extensions of the skin, which give them the power of supporting themselves for some time in the air, and of making prodigious leaps. Thus, by means of an expansile furry membrane, reaching from the fore-feet to the hind, the Flying Squirrels (*Pteromys*) bound, or rather swiftly sail, to the distance of twenty fathoms or more, and thus pass from one tree to another, always directing their flight obliquely downwards. They very rarely descend to the ground, and when taken or placed on it, run or spring somewhat awkwardly with their tail elevated,

beginning to climb with great activity as soon as they reach a tree.

The Galeopithecii, of the Indian Archipelago, and the Anomaluri of the west coast of Africa, are in like manner enabled to take long sweeping leaps from tree to tree, and no doubt the investigations of travellers will bring to light other animals endowed with similar powers, for when we consider how large a portion of the tropical zone has never yet been scientifically investigated, we have every reason to believe that many still remain unknown.



WANDEROOS.

## CHAPTER XL.

### APES AND MONKEYS.

The Forest Life of the Simiæ—Excellent Climbers, Bad Pedestrians—Similitude and Difference between the Human Race and the Ape—The Chimpanzee—Chim in Paris—The Gorilla—The Uran—The Gibbons—The Proboscis Monkey—The Huniman—The Wanderoo—The Cercopithecus—A Plundering Party—Parental Affection of a Cercopithecus—The Maimon—‘Happy Jerry’—The Pig-faced Baboon—The Derryas—Wide Difference between the Monkeys of both Hemispheres—Distinctive Characters of the American Monkeys—The Stentor Monkey—The Spider Monkeys—The Saïmiri—Friendships between various kinds of Monkeys—Nocturnal Monkeys—Squirrel Monkeys—Their Lively Intelligence—The Loris and Makis.

**I**N the midst of tropical vegetation, the Simiæ lead a free forest-life, for which they might well be envied. The green canopy of the woods protects them at every season of the year from the burning rays of a vertical sun, flowers of delicious fragrance embalm the air they breathe, and an endless

supply of fruits and nuts never allows them to know want, for should the stores near at hand be exhausted, an easy migration to some other district soon restores them to abundance. With an agility far surpassing that with which the sailor ascends the rigging, and climbs even to the giddy top of the highest mast, they leap from bush-rope to bush-rope, and from bough to bough, mocking the tiger-cat and the boa, which are unable to follow them in their rapid evolutions. Formed to live on trees, and not upon the ground, they are as excellent climbers as they are bad pedestrians. Both their fore and hind-feet are shaped as hands, generally with four fingers and a thumb, so that they can seize or grasp a bough with all alike.

Buffon erroneously remarks of the chimpanzee, that he always walks erect, even when carrying a weight; but this ape, as well as the other anthropomorphous simiæ, proves by the slowness and awkwardness of his movements, when by chance he walks upon even ground, that this position is by no means natural to him, or congenial to his organisation. Man alone of all creatures, possesses an upright walk; the ape, on the contrary, always stoops, and not to lose his equilibrium when walking, is obliged to place his hands upon the back of his head, or on his loins. Thus, in his native wilds, he rarely has recourse to this inconvenient mode of progression, and when forced by some chance or other to quit the trees, he leans while walking upon the finger-knuckles of his anterior extremities, a position which in fact, very much resembles walking on all-fours.

It is, indeed, only necessary to compare the long, robust, and muscular arms of the chimpanzee with his weaker and shorter hind-feet, to be at once convinced that he was never intended for walking. But see with what rapidity, with what power and grace, he moves from branch to branch, his hind-legs serving him only as hold-fasts, while his chief strength is in his arms. The tree is, without all doubt, for him what the earth is for us, the air for the bird, or the water for the fish.

The simiæ of the Old World are all distinguished by the common character of a narrow partition of the nose like that of man, and by the same number of teeth, each jaw being provided with ten grinders, two canine teeth, and four incisors, as in the human race. The large apes, or tailless monkeys, resemble us besides in many other respects, as well in their external

appearance as in their anatomical structure; and form, as it were, the caricature of man, both by their gestures and by glimpses of a higher intelligence.

Creatures so remarkably endowed have naturally at all times attracted a great share of attention, for if even the lowest links in the chain of animated beings lay claim to our interest, how much more must this be the case with beings whose faculties seem almost to raise them to the rank of our relations. The question how far this similarity extends has naturally given rise to many acute investigations and been differently answered, according as naturalists were more or less inclined to depress man to the level of the ape, or to widen the gulf between them. The former, pointing to the brutality of the lowest savages, would willingly make us believe that we are nothing but an improved edition of the Uran, while the latter cite in favour of their opinion, the incommensurable distance which exists between even the most degraded specimens of humanity and the most perfect quadrumana. Man alone is capable of continually progressive improvement; in him alone each generation inherits the acquirements of its fathers, and transmits the growing treasure to its sons, while the ape, like all other animals, constantly remains at the same point. The lowest savage knows how to make fire; the ape, though he may have seen the operation performed a thousand times, and have enjoyed the genial warmth of the glowing embers, will never learn the simple art. His hairy skin is a sufficient proof of his low intellect, an infallible sign that as he never would be able to provide himself with an artificial clothing, Nature was obliged to protect him against the inclemencies of the cold nights and the pouring rain. As man advances in age, his mind acquires a greater depth and a wider range. In the ape, on the contrary, signs of a livelier intelligence are only exhibited during youth, and as the animal waxes in years, its physiognomy acquires a more brutal expression; its forehead recedes, its jaws project, and instead of expanding to a higher perfection, its mental faculties are evidently clouded by a premature decline.

Both in Africa and Asia, we find large anthropomorphous apes, but while the Chimpanzee and the Gorilla exclusively belong to the African wilds, the Uran and the Gibbons are confined to the torrid regions of South Asia.

The Chimpanzee (*Simia troglodytes*) attains a height of about five feet, but seems much smaller from his stooping attitude. He inhabits the dense forests on the west coast of Africa, particularly near the river Gaboon, and as his travels are facilitated by his fatherland not being too far distant from Europe, there is hardly a Zoological Garden of any note that does not exhibit a chimpanzee among its lions. One of the finest specimens ever seen was kept a few years since in the Jardin des Plantes in Paris, where the mild climate, agreeable diet (he drank his pint of Bordeaux daily), and lively society of the French maintained him in wonderful health and spirits.

'The last time I saw him' (May 1854), says an accomplished naturalist,\* 'he came out to inhale the morning air in the large circular inclosure in front of the monkey palace, which was built for our poor relations by M. Thiers. Here Chim began his day by a leisurely promenade, casting pleased and thankful glances towards the sun, the beautiful sun of early summer.

'He had three satellites, Coatimondis, either by chance or to amuse him, and while making all manner of eyes at a young lady, who supplied the *Singerie* with pastry and cakes, one of the coatimondis came up stealthily behind, and dealt him a small but malicious bite. Chim looked round with astonishment at this audacious outrage on his person, and put his hand hastily upon the wound, but without losing his temper in the least. He walked deliberately to the other side of the circle, and fetched a cane which he had dropped in his promenade. He returned with majestic wrath upon his brow, mingled, I thought, with contempt, and taking coati by the tail, commenced punishment with his cane, administering such blows as his victim could bear without permanent injury, and applied with equal justice on the ribs at either side. When he thought enough had been done, he disposed of coati, without moving a muscle of his countenance, by a



RUFIOUS COATIMONDI

\* Quarterly Review, 1855, p. 22.

left-handed jerk, which threw the delinquent high in air, head over heels.

‘He came down a sadder and a better coati, and retired with shame and fear to a distant corner. Having executed this act of justice, Chim betook himself to a tree. A large baboon, who had in the meantime made his appearance in the circle, thought this was a good opportunity of doing a civil thing, and accordingly mounted the tree, and sat down smilingly, as baboons smile, upon the next fork. Chim slowly turned his head at this attempt at familiarity, measured the distance, raised his hind foot, and as composedly as he had caned the coati, kicked the big baboon off his perch into the arena below. This abasement seemed to do the baboon good, for he also retired like the coati, and took up his station on the other side.’

The body of the chimpanzee is covered with long hair on the head, shoulders, and back, but much thinner on the breast and belly. The arms and legs are not so disproportionate as those of the uran, the fore-fingers not quite touching the knees when the animal stands upright. The upper part of the head is very flat, with a retiring forehead, and a prominent bony ridge over the eye-brows, the mouth is wide, the ears large, the nose flat, and the face of a blackish-brown colour.

From this short notice it will be seen at once that friend Chim has not the least claim to beauty, but yet he is far from equalling the hideous deformity of the Gorilla, whom M. Du Chaillu has so prominently introduced to public notice. This savage animal, which is covered with black hair like the chimpanzee, and resembles it in the proportion of its body and limbs, though its form is much more robust, unites a most ferocious and undaunted temper with an herculean bodily strength, and is said to hold undisputed dominion of the hill-forests in the interior of Lower Guinea, forcing even the panther to ignominious flight.

To kill a gorilla is considered by the negroes as a most courageous exploit; and Dr. Savage, an American missionary on the coast of Guinea, who, in a memoir published at Boston in the year 1847, was the first to point out the generic differences between this formidable ape and the chimpanzee, tells us that a slave having shot a male and female gorilla, whose skeletons

afterwards came into his possession, was immediately set at liberty and proclaimed the prince of hunters.

M. Du Chaillu's description of his first encounter with an adult gorilla, shows that this distinction was by no means unmerited, and that it requires all the coolness and determination of an accomplished sportsman to face an animal of such appalling ferocity and power. 'The under-bush swayed rapidly just ahead, and presently before us stood an immense male gorilla. He had gone through the jungle on his all-fours, but when he saw our party he erected himself, and looked us boldly in the face. He stood about a dozen yards from us, and was a sight I think I shall never forget. Nearly six feet high (he proved four inches shorter), with immense body, huge chest, and great muscular arms, with fiercely glaring, large deep-grey eyes, and a hellish expression of face, which seemed to me like some night-mare vision; thus stood before us the king of the African forest. He was not afraid of us. He stood there and beat his breast with his huge fists, till it resounded like an immense bass-drum, which is their mode of offering defiance, meantime giving vent to roar after roar. The roar of the gorilla is the most singular and awful noise heard in these African woods. It begins with a sharp bark like an angry dog, then glides into a deep bass roll which literally and closely resembles the roll of distant thunder along the sky, for which I have been sometimes tempted to take it when I did not see the animal. So deep is it that it seems to proceed less from the mouth and throat than from the deep chest and vast paunch. His eyes began to flash deeper fire as we stood motionless on the defensive, and the crest of short hair which stands on his forehead began to twitch rapidly up and down, while his powerful fangs were shown as he again sent forth a thunderous roar.

'And now truly he reminded me of nothing but some hellish dream-creature; a being of that hideous order, half-man, half-beast, which we find pictured by old artists in some representations of the infernal regions. He advanced a few steps, then stopped to utter that hideous roar again, advanced again, and finally stopped when at a distance of about six yards from us. And here, just as he began another of his roars, beating his breast in rage, we fired and killed him. With a groan which had

something terribly human in it, and yet was full of brutishness, he fell forward on his face. The body shook convulsively for a few minutes, the limbs moved about in a struggling way, and then all was quiet—death had done its work, and I had leisure to examine the huge body. It proved to be five feet eight inches high, and the muscular development of the arms and breast showed what immense strength he had possessed.'

Deep in the swampy forests of Sumatra and Borneo, lives the famous Uran, or 'Mias' as he is called by the Malays. He is less human in his shape than the chimpanzee, as his hind-legs are shorter and his arms so long that they reach to his ankles, but in intelligence he is supposed to be his superior. The jaws are more projecting, and the thick pouting lips add to the brutal expression of his physiognomy. While in a well-proportioned human face the distance from the chin to the nose forms but a third of the total length, it amounts to one-half in the Uran. But little of the restlessness of the monkey is to be seen in him. He loves an indolent repose, and the necessity for procuring food seems alone capable of rousing him from his laziness. When satiated, he immediately resumes his favourite position, sitting for hours together upon a branch, with bent back, with eyes immovably staring upon the ground, and uttering from time to time a melancholy growl. He generally spends the night on the crown of a nibong-palm or of a screw pine: he often also seeks a refuge against the wind and cold among the orchids and ferns which cover the branches of the giant trees. There he spreads his couch of small twigs and leaves, for he distinguishes himself from all other apes by his not sleeping in a sitting position, but on the back or on one side, and in inclement weather he is even said to cover his body with a layer of foliage. The Dyaks affirm that the Mias is never attacked by other animals, except by the crocodile and the tiger-snake. When there are no fruits in the jungle, he goes to the river banks, where he finds many young shoots which he likes to eat, and fruits which grow near to the water. Then the crocodile sometimes tries to seize him, but the Mias springs upon it, lacerates and kills it. An old Dyak chieftain told Mr. Wallace that he had once witnessed a combat of this kind, in which the Mias is invariably the conqueror. When attacked by a tiger-snake, he seizes the reptile with his hands

and kills it with a vigorous bite. The Mias is very strong, stronger than any other animal of the jungle.

Rajah Brooke, who observed the sluggish Urans in their wild state, relates that even when chased and alarmed by the shouts of men and the firing, they never went from tree to tree faster than a man might easily follow through the jungle below. In general they sought the very summit of a lofty tree, and often remained seated without changing their position whilst several shots were discharged at them. The Dyaks catch them in the following manner. Having discovered the animal in a tree, they approach without disturbing him, and as quickly as possible cut down all the trees around the one he is in. Being previously provided with poles, some with nooses attached to the ends and others forked, they fell the isolated tree, and noosing and forking down the uran, soon make him their captive.

The series of the large anthropomorphous apes closes with the Gibbons. Their arms, which reach to the ankle joints when the animal is standing erect, are longer than those of the uran; their brain, and consequently their intelligence, is less developed; and moreover, like all the following simiæ of the Old World, they possess callosities on each side of the tail. Their size is inferior to that of the uran, and their body is covered with thicker hair, grey, brown, black, or white—according to the species—but never party-coloured, as is the case with many of the long-tailed monkeys.

To the gibbons belong the black Siamang of Sumatra—who, assembled in large troops, hails the first blush of early morn, and bids farewell to the setting sun with dreadful clamours—the black, white-bearded Lar of Siam and Malacca, and the Wou-Wou (*Hylobates leuciscus*), who, hanging suspended by his long arms, and swinging to and fro in the air, allows one to approach within fifty yards, and then, suddenly dropping upon a lower branch, climbs again leisurely to the top of the tree. He is a quiet, solitary creature of a melancholy peaceful nature, pursuing a harmless life, feeding upon fruits in the vast untrodden recesses of the forest; and his peculiar noise is in harmony with the sombre stillness of these dim regions, commencing like the gurgling of water when a bottle is being filled, and ending with a long loud wailing cry, which resounds throughout

the leafy solitude to a great distance, and is sometimes responded to from the depths of the forest by another note as wild and melancholy.

Besides the uran and the gibbons, Asia exclusively possesses the Semnopithecus and the Macaques, while Africa, besides the chimpanzee and the gorilla, enjoys the undivided honour of giving birth to the families of the Cercopithecus, Mangabeys, Colobi, Magots, and Baboons.

The Semnopithecus are characterised by a short face, rounded ears, a slender body, short thumbs, and a strong muscular tail, terminated by a close tuft of hair, and surpassing in length that of all the other quadrumana of the Old World. To this genus belongs the celebrated Proboscis Monkey (*Semnopithecus nasicus*) of Borneo, who is distinguished from all other simiæ by the possession of a prominent nasal organ, which lends a highly ludicrous expression to the melancholy aspect of his physiognomy. 'When excited and angry,' says Mr. Adams, who had many opportunities of examining this singular creature in its native woods, 'the female resembles some tanned and peevish hag, snarling and shrewish. They progress on all-fours, and sometimes, while on the ground, raise themselves upright and look about them. When they sleep, they squat on their hams, and bow their heads upon the breast. When disturbed, they utter a short impatient cry, between a sneeze and a scream, like that of a spoilt and passionate child; and in the selection of their food they appear very dainty, frequently destroying a fruit, and hardly tasting it. When they emit their peculiar wheezing or hissing sound, they avert and wrinkle the nose, and open the mouth wide. In the male, the nose is a curved, tubular trunk, large, pendulous, and fleshy; but in the female it is smaller, recurved, and not caruncular.'

Under the ugly form of the Huniman (*Semnopithecus Entellus*), the Hindoos venerate the transformed hero who abstracted the sweet fruit of the mango from the garden of a giant in Ceylon, and enriched India with the costly gift. Out of gratitude for this service, the Hindoos allow him the free use of their gardens, and take great care to protect him from sacrilegious Europeans. While the French naturalist Duvaucel was at Chandernagor, a guard of pious Brahmins was busy scaring away the sacred animals with cymbals and drums, lest the

stranger, to whom they very justly attributed evil intentions, might be tempted to add their skins to his collection.

The Semnopithecii are scattered over Asia in so great a multiplicity of forms, that Ceylon alone possesses four different species, each of which has appropriated to itself a different district of the wooded country, and seldom encroaches on the domain of its neighbours. 'When observed in their native wilds,' says Sir J. E. Tennent, 'a party of twenty or thirty of the Wanderoos of the low country, the species best known in Europe (*Presbytes cephalopterus*), is generally busily engaged in the search for berries and buds. They are seldom to be seen on the ground, and then only when they have descended to recover seeds or fruit that have fallen at the foot of their favourite trees. In their alarm, when disturbed, their leaps are prodigious, but generally speaking their progress is made not so much by *leaping* as by swinging from branch to branch, using their powerful arms alternately, and when baffled by distance, flinging themselves obliquely so as to catch the lower bough of an opposite tree; the momentum acquired by their descent being sufficient to cause a rebound, that carries them again upwards till they can grasp a higher branch, and thus continue their headlong flight. In these perilous achievements wonder is excited less by the surpassing agility of these little creatures, frequently encumbered as they are by their young, which cling to them in their career, than by the quickness of their eye and the unerring accuracy with which they seem to calculate almost the angle at which a descent would enable them to cover a given distance, and the recoil to elevate themselves again to a higher altitude.'

The African Colobi greatly resemble the Asiatic Semnopithecii, but differ by the remarkable circumstance of having no thumb on the hands of their anterior extremities.

The Cercopithecii likewise possess a large tail, which is, however, not more or less pendulous, as in the semnopithecii, but generally carried erect over the back. They have also a longer face, and their cheeks are furnished with pouches, in which, like the pelican or the hamster, they are capable of stowing part of their food; an organisation which seems to denote that they are inhabitants of a country where the forests are less extensive. They are not devoid of intelligence, but extremely restless and noisy. Many that were mild and amiable while young, undergo

at a later period a complete change of character. The only way, according to M. Isidore Geoffroy, to curb the temper of one of these full-grown monkeys is to extract the sharp and formidable canine teeth, with which it is capable of inflicting the most dangerous wounds. When disarmed, it immediately alters its manners, as it now feels its impotence. Several of the monkeys belonging to this group are distinguished by the lively colours of their fur ; that of the Diana Monkey (*Cercopithecus diana*) among others, which is a native of Congo and Guinea, sells for a considerable price.

Nothing can be more amusing to the disinterested spectator or more provoking to the proprietor than to witness the operations of a troop of Cercopithecii while plundering a dhourra or maize field. Under the guidance of an old and experienced male, the impudent robbers set out on their foraging expedition. The female monkeys carry with them their young ones, who, clasping their mother's neck with their fore-feet, sometimes also wind their little caudal appendages as an additional support round her tail. At first the band approaches with great caution, the leader constantly at its head, and the others following from branch to branch. Sometimes he climbs to the top of a high tree for the purpose of reconnoitring, and finding all safe, a few tranquillising guttural sounds make known to his followers the satisfactory results of his inspection. Alighting from the tree nearest to the field, a few leaps bring them to the scene of action, where their first care is to stuff their wide cheek pouches with provender as fast as they can. This done, they allow themselves more leisure and at the same time become more choice in the selection of their food. Every ear of maize or dhourra after having been plucked from the plant is now carefully examined, and if not approved of, thrown away. When a monkey has an abundance of food at his disposal, he will spoil at least ten times more than he eats. The troop now feeling itself thoroughly secure, the mothers allow their young, who are generally kept under strict control, to leave them and amuse themselves with their play-fellows. The little creatures, who by the bye are intensely ugly, have been so well brought up that at the first sound of alarm they immediately return to their mothers, who, like all other members of the band, implicitly rely upon the watchfulness of the leader.

From time to time this cautious 'old gentleman' will interrupt the most savoury repast, raise himself on his hind-legs, stand upright like a man, and look about him. A single inimitable gurgling tone of alarm gathers in a moment the troop of his followers; the mothers recall their young ones, and all are instantly ready for flight; each carrying with him as much provender as he can. The nearest tree is ascended in a trice, and from this starting point the hurried flight goes on from branch to branch. The expertness of the monkeys in climbing and springing is indeed wonderful, and surpasses that of all other animals. For them there is no impediment: the sharpest thorns, the thickest hedges—nothing retards them. The most daring leaps are executed with an admirable ease. Seizing a high branch with its outstretched hand, a monkey will swing himself upon it, a feat which no cat or squirrel can imitate; or he will throw himself from the summit of a tree upon a branch far below, which bends under the sudden shock of his weight, and then makes use of the recoil to perform a mighty horizontal bound. While this precipitate flight is going on, the leader still directs the movements of the band, which only relaxes in its haste when he thinks proper. All this time they show not the least signs of confusion, and such is their presence of mind that it preserves them from all danger. In fact they have no enemies to fear but other monkeys and the serpents; for they easily get out of the reach of the larger beasts of prey, and no bird will attack them, as it well knows that it would be at once assailed by a whole band. Thus a life as void of care as life can be, has fallen to the lot of these free denizens of the forest.

Brehm relates an affecting instance of parental friendship in a tame male *Cercopithecus*. Koko (as the monkey was called) had adopted a young one of the same species, still very much in want of his mother's assistance. He treated it with all the affection of a parent, watched over it while eating, and warmed it at night in his arms. He was constantly anxious about its welfare, got uneasy when it strayed away only a few paces, and called it immediately back again at the least apprehension of danger. When Brehm tried to remove it, he got furious and defended his adopted child with all his might. Thus both monkeys lived together several months, when the young one

fell ill and soon after died. The sorrow of the bereaved foster-father was excessive, not like that of an animal, but similar to the grief of a deeply-feeling man. At first he took the stiffening body in his arms, caressed it in all possible manners, and attended upon it as before, with the tenderest care. He then placed it in a sitting posture before him, looked at it attentively, and uttered a plaintive cry when he saw it collapse. Again and again he tried to recall it to life; and every time he uttered a loud cry when he saw that his favourite remained dead. The whole day he took no food, the dead little monkey occupied him constantly. At length Brehm took away the body by force and threw it over the high wall of the courtyard into the garden. But in a few minutes the monkey had bitten the strong rope through to which he was fastened, sprang over the wall and returned with the body in his arms. Brehm now again bound him fast, took the dead body away and threw it into a deep well. The monkey immediately freed himself once more from his bonds, remained for hours searching for the body, and then left the house for ever. In the evening of the same day he was seen on his way to the woods. 'To call such and similar actions instinct,' says Brehm, 'would be ridiculous. They are proofs of intellect and deep feeling. There are apes who surpass many obtuse members of the human race in sense, and their intelligence grows by experience, as I have frequently observed in tame monkeys. Without hesitation we may rank the simiæ next to man as the most highly developed animals, not only in their physical organisation, but also in intelligence.'

The tribes of the Mangabeys, Macaques, Magots, and Cynopithecî form the links between the cercopithecî and the baboons. Their shape is less slender than that of the former, their frontal bone is more developed, particularly above the eyebrows, and their face is longer. They are all of them provided with cheek-pouches. Several of the macaques have a very short tail, and the magots, or Barbary apes, and the cynopithecus of the Philippine Islands, have none, thus resembling the large anthropomorphous apes, but widely differing from them in other respects.

The Magot is the only European species, and seems exclusively confined in our part of the world to the rock of Gibraltar, though some authors affirm that it is found in other

parts of Andalusia, and even in the province of Grenada. It would no doubt long since have been extirpated, if the British Government had not taken it under its especial protection, and imposed the penalty of a heavy fine upon its wanton destruction.

The Cynocephali (Baboons and Mandrills) show at once by their Greek name that a dog-like snout gives them a more bestial expression than belongs to the rest of the monkey tribes, and that of all the simiæ of the Old World they are most widely distant from man. In size they are only surpassed by the gorilla and the uran, and if in the latter the physiognomy becomes more brutal in its expression with advancing age, this degradation is much greater in the baboons.

Their canine teeth in particular acquire a greater sharpness than those of almost every other carnivorous animal, so that these malignant and cruel animals, armed with such powerful weapons, may well be reckoned among the most formidable of the wild beasts of Africa. As if to render them complete pictures of depravity, their manners also are so shamelessly filthy, that the curiosity they excite soon changes into horror and disgust.

The short-tailed mandrills inhabit the west coast of Africa. The Maimon is the most remarkable of the whole genus for brilliancy and variety of colour; its furrowed cheeks are magnificently striped with violet, blue, purple, and scarlet, so as more to resemble an artificial tattooing than a natural carnation. As the creature increases in age, the nose also becomes blood-red. On the loins the skin is almost bare, and of a violet-blue colour, gradually altering into a bright blood-red, which is more conspicuous on the hinder parts, where it surrounds the tail, which is generally carried erect.

Even among the base mandrills there are some which maintain in confinement the milder character of their youth, and on whom education has had such influence as to allow them to be introduced into company without fear of a too flagitious breach of decorum. One of these pattern animals was 'Happy Jerry,' long kept in a London menagerie, and who gained such fame by his good manners as to be honoured by a special invitation to Windsor. Jerry knew how to sit upon a chair, and worthily to fill it, as he was nearly five feet long. He relished

his pot of porter, which he used to drink out of a pewter can, and smoked his pipe with all the gravity of a German philosopher. But even Jerry was not to be trusted out of the sight of his keepers.

MANDRILL (*CYNOCEPHALUS MAIMON*).

PIG-FACED BABOON.

The real baboons are distinguished from the mandrills by a long tail, terminated by a tuft of hair. The great baboon of Senegal (*Cynocephalus Sphinx*) is by no means devoid of intelligence, and learns many tricks when taught from early youth. His temper, however, is brutal and choleric, though less so than the Chacma (*Cynocephalus porcarius*), or pig-faced baboon, which is found in the vicinity of Cape Town, among others on the celebrated Table Mountain. Young chacmas are often kept as domestic animals, performing the offices of a mastiff, whom they greatly surpass in strength. Thus they immediately announce by their growling the approach of a stranger, and are even employed for a variety of useful purposes which no dog would be able to perform. Here one is trained to blow the bellows of a smith; there another to guide a team of oxen. When a stream is to be crossed, the chacma immediately jumps upon the back of one of the oxen, and remains sitting till he has no longer to fear the wet, which he loves as little as the cat.

In Abyssinia, Nubia, and South Arabia we find the Derryas (*C. Hamadryas*), which enjoyed divine honours among the ancient Egyptians. The general colour of the hair is a mixture of light-grey and cinnamon, and in the male that of the head and neck forms a long mane, falling back over the shoulders. The face is extremely long, naked, and of a dirty flesh-colour. This ugly monkey was revered as the symbol of Thoth, the divine father of literature and the judge of man after death. Formerly temples were erected to his honour, and numerous priests ministered to his wants, but now, by a sad change of

baboon-fortune, he is shot without ceremony, and his skin pulled over his ears to be stuffed and exhibited in profane museums.

The monkeys of the New World differ still more widely from those of the Old than the copper-coloured Indian from the woolly Negro. One sees at once on comparing them that whole oceans roll between them, that they have not migrated from one hemisphere to another, but belong to two different phases of creation. While the nasal partition of the Old World simiæ is narrow as in man, it is broad without exception in all the American monkeys, so that the nostrils are widely separated and open sideways. The dental apparatus is also different, for while the monkeys of our hemisphere have thirty-two teeth, those of the western world generally possess thirty-six.

The tailless monkeys or apes, and the short-tailed baboons, are peculiar to our hemisphere, and it is only here that we find almost voiceless simiæ, while the American quadrumana are all of them tailed, short-snouted, and generally endowed with stentorian powers. Finally, it would be as useless to look among the western monkeys for cheek-pouches and sessile callosities, as among those of the Old World for prehensile tails.

In the boundless forests of tropical South America, the monkeys form by far the greater part of the mammalian inhabitants, for each species, though often confined within narrow limits, generally consists of a large number of individuals. The various arboreal fruits which the savage population of these immeasurable wilds is unable to turn to advantage, fall chiefly to their share; many of them also live upon insects. They are never seen in the open savannahs, as they never touch the ground unless compelled by the greatest necessity. The trees of the forests furnish them with all the food they require; it is only in the woods that they feel 'at home' and secure against the attacks of mightier animals; why then should they quit them for less congenial haunts? For their perpetual wanderings from branch to branch, Nature has bountifully endowed many of them, not only with robust and muscular limbs and large hands, whose moist palms facilitate the seizure of a bough, but in many cases also with a prehensile tail, which may deservedly be called a fifth hand, and is hardly less wonderful in its structure than the proboscis of the elephant. Covered with short hair, and completely bare underneath towards the end,

this admirable organ rolls round the boughs as though it were a supple finger, and is at the same time so muscular that the monkey frequently swings with it from a branch like the pendulum of a clock. Scarce has he grasped a bough with his long arms, when immediately coiling his fifth hand round the branch, he springs on to the next, and secure from a fall, hurries so rapidly through the crowns of the highest trees that the sportsman's ball has scarce time to reach him in his flight.

When the Miriki (*Ateles hypoxanthus*), the largest of the Brazilian monkeys, sitting or stretched out at full length, suns himself on a high branch, his tail suffices to support him in his aerial resting-place, and even when mortally wounded, he remains a long time suspended by it, until life being quite extinct, his heavy body, whizzing through the air, and breaking many a bough as it descends, falls with a loud crash to the ground.

In general the American monkeys are distinguished by a much milder disposition than those of the eastern hemisphere, and retain at an advanced age the playful manners of their youth. They are commonly more easy to tame, and learn many little tricks which are taught with much greater difficulty to their restless Asiatic or African cousins. Their weakness, their short canine teeth, their good temper, render them harmless play-fellows, and thus they are generally preferred in Europe to the Old World monkeys, though they are not so lively, and constantly have a more or less dejected mien, as if they still regretted the primitive freedom of the forest.

The American monkeys may be conveniently divided into two large groups; with or without a prehensile tail. To the first great subdivision belong the Howling Monkeys or Aluates (*Mycetes*), the Spider Monkeys (*Ateles*), the Sajous, and several other intermediate genera.

The Aluates are chiefly remarkable for their stentorian powers, which no other animal can equal or approach. When the nocturnal howl of the Large Red Howling Monkey (*Mycetes ursinus*) bursts forth from the woods, you would suppose that all the beasts of the forest were collecting for the work of carnage. Now it is the tremendous roar of the jaguar as he springs on his prey; now it changes to his terrible and deep-toned growlings as he is pressed on all sides by superior

force; and now you hear his last dying moan, beneath a mortal wound. Some naturalists have supposed that these awful sounds can only proceed from a number of the red monkeys howling in concert, but one of them alone is equal to the task. In dark and cloudy weather, and just before a squall of rain, the Aluate often howls in the day-time; and on advancing cautiously to the high and tufted tree where he is sitting, one may then have a good opportunity of seeing the large lump in his throat, the sounding-board which gives such volume to his voice, move up and down as he exerts his stentorian lungs.



HOWLING MONKEY.

The howling monkeys are the most robust of the American simiæ, and in spite of their long tail have a certain analogy with the urans, whom they may be said to represent in the New World. Their various species range from Paraguay to Honduras, while the Ateles or Spider Monkeys, thus named from their long slender limbs and sprawling movements, extend over the whole surface of tropical America. The marimonda (*Ateles Belzebrub*) is even found on the eastern slopes of the Andes at a height of 10,000 feet above the level of the sea, an elevation attained by him alone of all the quadrumanous tribes. Like the African Colobi, the spider monkeys have no thumb on their fore-hands; their voice is a soft and flute-like whistling, resembling the piping of a bird. It is said that when a mother burthened with her young hesitates to take too wide a leap, *paterfamilias* seizes the branch she intends to reach, and swings himself to and fro with it, until his companion is able to attain it by a spring.

The second group of American monkeys, consisting of those with a non-prehensile tail, comprises the Sakis, the Saïmiris, the Ouistitis, &c.

The Sakis, or Fox-tailed Monkeys, are distinguished by their bushy tail, which, however, in some species, is very short. They usually live in the outskirts of forests, in small societies of ten or twelve. Upon the slightest provocation, they display a morose and savage temper, and, like the howling-monkeys, utter loud cries before sunrise and after sunset.

The elegant ease of their movements, their soft fur, the large size of their brilliant eyes, and their little round face, entitle the Saimiris to be called the most graceful of monkeys. On speaking to them for some time, they listen with great attention, and soon lay their tiny hand upon the speaker's mouth, as if to catch the words as they pass through his lips. They recognise the objects represented in an engraving even when not coloured, and endeavour to seize the pictured fruits or insects. The latter, and particularly spiders, which they catch most dexterously with their lips or hands, seem to be their favourite food. The weak little creatures are very fond of being carried about by larger monkeys, and cling fast to their back. At first the animal to which they thus attach themselves endeavours to get rid of its burden, but finding it impossible, it soon becomes reconciled to its fate, and after a short time an intimate affection arises between them, so that when the saimiri is busy chasing insects, his friend, before leaving the spot, first gives him notice by a gentle cry.

The habits of the Nyctopithecii, or nocturnal monkeys, bear a great resemblance to those of the bats or flying foxes. The shy and quiet little animals sleep by day, concealed in the dense thickets of the forest. Their eye and motions are completely feline. Those which Von Martius observed in his collection, crept by day into a corner of the cage, but after sunset their agility made up for their diurnal torpor.

In Guiana, Schomburgk met with the *Nyctipithecus trivirgatus* as a domestic animal. 'A very neat little monkey, shy of light as the owl or the bat. A small round head, extremely large yellow eyes, shining in the dark stronger than those of the cat, and tiny short ears, give it a peculiarly comical appearance. When disturbed in its diurnal sleep and dragged forth to the light, its helpless movements excite compassion; it gropes about as if blind, and lays hold of the first object that comes within its reach, often pressing its face against it to escape the intolerable glare. The darkest corner of the hut is its seat of predilection, where it lies during day in a perfect asphyxia, from which it can only be roused by blows. But soon after sunset it leaves its retreat, and then it is impossible to see a more lively, active, and merry creature. From hammock it springs to hammock, generally licking the faces of the

sleepers, and from the floor to the rafters of the roof, overturning all that is not sufficiently fastened to resist its curiosity.'

Its hair, which is grey on the back and orange-coloured on the belly, is much thicker than that of the other monkeys, and somewhat woolly, thus being admirably suited to the colder temperature of its nocturnal rambles. It ranges over a great part of South America, but on account of its retirement during the day is very rarely caught. Its voice is remarkably strong, and, according to Humboldt, is said to resemble the jaguar's roar, for which reason it is called the Tiger Monkey in the missions along the Orinoco. It lives chiefly on nocturnal insects, thinning their ranks like the bat, but is also said to prey upon small birds like the owl. In the Andes of New Granada, in the large forests of Quindiu, the *N. lemurinus* lives at an elevation of from four to five thousand feet above the level of the sea, and makes the woods resound during the night with his clamorous cry of 'dūrūcūli.'

The Ouistitis, or Squirrel Monkeys, are distinguished from all the other American quadrumana by the claws with which all their fingers, except the thumbs of their hands, are provided, and which render them excellent service in climbing. They have a very soft fur, and are extremely light and graceful in their movements, as well as elegant in their forms. The young are often not bigger than a mouse, and even a full-grown ouistiti is hardly larger than a squirrel, whom it resembles both in its mode of life, and by its restless activity, as its little head is never quiet. They use their tail, which in many species is handsomely marked by transverse bars, as a protection against the cold, to which they are acutely sensitive. Their numerous species are dispersed over all the forests of tropical America, where they live as well upon fruits and nuts as upon insects and eggs; and when they can catch a little bird, they suck its brain with all the satisfaction of an epicure. They are easily tamed, but very suspicious and irritable.

The learned French naturalist, Audouin, made some interesting observations on a pair of tame ouistitis, which prove their intelligence to be far superior to that of the squirrels, to whom they are often compared. One of them, while regaling on a bunch of grapes, squirted some of the juice into its eye,

and never failed from that time to close its eyes while eating of the fruit. In a drawing they recognised not only their own likeness, but that of other animals. Thus the sight of a cat, and what is still more remarkable, that of a wasp, frightened them very much, while at the aspect of any other insect, such as a cricket or a cockchafer, they at once rushed upon the engraving, as if anxious to make a meal of the object that deluded them with the semblance of life.

In the forests of tropical Africa and Asia we find a remarkable group of animals, which, though quadrumanous like the monkeys, essentially differs from them by possessing long curved claws on the index, and also on the middle finger of the hinder extremities; by a sharp, projecting muzzle, and by a different dentition. The Loris, remarkable for the slowness of their gait and their large glaring eyes, are exclusively natives of the East Indies; the Galagos, which unite the organisation of the monkeys with the graceful sprightliness of the squirrels, are confined solely to Africa, where they are chiefly found in the gum-forests of Senegal; the Tarsii, with hinder limbs of a disproportionate length, are restricted to a part of the Indian Archipelago; but the large island of Madagascar, where, strange to say, not a single monkey is found, is the chief seat of the family, being the exclusive dwelling-place of the short-tailed Indri (whom, from his black thick fur and anthropomorphous shape, one would be inclined to reckon among the gibbons), and of the long-tailed Lemurs or Makis. All these gentle and harmless animals are arboreal in their habits, avoid the glaring light of day under the dense covert of the forest, and awaken to a more active existence as soon as night descends upon the earth. Then the loris, who during the day have slept clinging to a branch, prowl among the forest-boughs in quest of food. Nothing can escape the scrutiny of their large glaring eyes; and



HANDED LEMUR.

when they have marked their victim, they cautiously and noiselessly approach till it is within their grasp. The Galagos have at night all the activity of birds, hopping from bough to bough on their hind limbs only. They watch the insects flitting among the leaves, listen to the fluttering of

the moth as it darts through the air, lie in wait for it, and then spring like lightning upon their prize. The long-legged Tarsii leap about two feet at a spring, and feed chiefly on small lizards, holding, squirrel-like, their prey in their fore-hands, while they rest on their haunches.



TARSIVS BANCANVS.



HEAD DRESSES OF EAST AFRICAN NEGROES.

## CHAPTER XLI.

### THE AFRICAN NEGROES.

Causes of the Inferiority of Negro Civilisation—Natural Capabilities of the Negro—Geographical Formation of Africa—Its Political Condition—Physical Conformation of the Negro—Fetichism—The Rain-Doctor—The Medicine-Man—Religious Observances—Gift-Offerings—Human Sacrifices—Ornaments—The Pelélé—The Bonnians—Their Barbarous Condition—The Town of Okolloma—Negroes of the Lake Regions—The Iwanza—Slavery—A Miserable Group.

WITH the exception of the narrow strip of territory fertilized by the annual inundations of the Nile, where stately pyramids and the ruins of vast palaces and temples proclaim the ancient glories of Egypt; or of the coast-lands of the Mediterranean, where once Carthage reigned and Utica flourished, Africa has ever been a region without influence on the progressive march of mankind. From the vast and still partly unknown countries inhabited by the Negro or the Kaffer no gleam of genius has ever shone forth to enlighten the world; no invention has ever proceeded for the benefit of the human race; no individual has ever risen to eminence in science or in art; but all, from generation to generation, has

ever been one dull, monotonous scene of ignorance, barbarism, and stagnation.

As to the causes of this stationary unprogressive state opinions are greatly divided, for while some authorities consider the African as decidedly inferior in intellect to the more favoured races of Europe, he is according to others merely the victim of unfortunate circumstances, which have never allowed the latent germs of improvement to quicken into life? That there is no defect in his organisation to account for his low condition, is sufficiently proved by the celebrated physiologist, Tiedemann, who found, as the result of numerous measurements and examinations, that his brain is by no means smaller than that of the European, and that its form and structure are identical.

Travellers and missionaries who have had the best opportunities of forming a just estimate of the character and capacities of the Negroes, describe them as social, generous, and confiding. No one, such is their opinion, can live among them without being impressed with their natural energy of character, their shrewdness and close observation, the cunning with which they can drive a bargain, and the perfect adroitness with which they practise upon the unsuspecting credulity of white men. They have long since risen above the hunter life, have fixed habitations, cultivate the soil for the means of subsistence, have herds of domestic animals, construct for themselves houses sufficient to protect them alike from the scorching heat of the sun and the chilly damps of night, show a taste for the mechanical arts, a surprising skill in the fabrication of implements of warfare and articles of ornament, and at the same time a decided taste and aptitude for commercial pursuits.

The Southern Kaffers gradually pass through the transition of intermediate tribes into the pure typical equatorial Negroes, and travellers have been astonished at the acuteness of intellect displayed by the Zulus, Betchuanas, and other Kaffer nations. Of the Mandingoes, a pure Negro race, inhabiting parts of Senegambia and Upper Guinea, shrewd observers assure us that no one who has had personal intercourse with them, can have the least doubt as to their intellectual equality with Europeans. These few examples, to which many others

might be added, sufficiently prove that there is no wide impassable gulf between the negro and the white races.

The aboriginal Africans are indeed averse to all abstract discussions, but they have excellent memories, lively imaginations, much instinctiveness, and very close observation. With the exception of the Veys, who have recently invented an alphabet for themselves (a circumstance in itself sufficient to establish their claims to a high degree of intelligence), none of the nations along the sea coast regions have any written literature, but this is not to be set down as a mark of mental imbecility. Their thoughts, as a matter of necessity, must operate in a comparatively narrow circle; but it does not follow that they are less active on that account. They have abundant stores of unwritten lore, allegories, legends, traditionary stores, fables—and many of their proverbs bear testimony to their sound good sense.

Men of remarkable ability have risen up among the Africans from time to time, as well as amongst other portions of the human family. Some have excited the admiration of large districts by their wisdom, others have been the wonder of their generation by their personal prowess and deeds of arms, but the total absence of literature leads to the loss of all former experience and the lessons of the sage and the feats of the hero have been alike forgotten.

The detractors of the Negroes have generally formed their opinion upon the most unfavourable specimens of the race, upon tribes living in a pestilential climate along the sultry coasts of Guinea, upon the victims of oppression, upon slaves or the descendants of slaves. But everywhere we find physical and moral inferiority resulting from conditions which cramp the natural energies of man, and among the most highly civilised nations a considerable part of the population shows the fatal stigmas of ignorance and want in a stunted growth and a blighted intellect. It is evidently as erroneous to judge of the whole Negro race by its inferior representatives, as it would be to measure the English nation by the low standard of the refuse of our cities. The reasons for the torpid state of Africa, when compared with the ancient civilisation of Asia or the progressive march of Europe, must therefore be sought for, not in an organic and consequently incurable incapacity

for higher attainments, but in unfavourable external circumstances, and these are quite sufficient to account for its existence.

Among the causes which have contributed to retard the march of improvement in Africa, one of the most important is its compact geographical formation and the natural obstacles which render the access to its interior so extremely difficult. While Europe possesses a vast extent of coast line, numerous harbours, large peninsulas, deep gulfs and bays, and broad navigable rivers, Africa is deprived of these physical advantages. Though more than three times larger than Europe, its coasts are not only less extensive by one-fourth, but are also frequently bounded, particularly within the tropics, by sandy deserts or unhealthy swamps, which render them in a great measure inaccessible or useless to man. We there see no such peninsulas as Italy or Portugal and Spain, stretching far out into the ocean, and affording a seat to a numerous maritime population; no such great mediterranean seas as the Baltic, the Adriatic, or the Ægean; and while in Europe many rivers carry the tides far into the interior of the land, and extend as it were the domains of ocean into the bosom of the continent, a great number of the streams of Africa are often rendered unnavigable by long-continued droughts, or even cease to flow altogether during a considerable part of the year. But the sea is not only the great highway of commerce, it also enlarges the sphere of man's ideas, by bringing him into easier contact with other nations; it not only conveys the productions of every zone from coast to coast, but civilisation is also wafted upon its waves from shore to shore. Thus the vicinity of the sea has been as favourable to the development of a great part of Europe as the confinement or isolation of the Negro within the bounds of his native continent has tended to retard his improvement.

Even in the interior of Africa itself, communications are rendered difficult by many natural obstacles. The fertile regions of the Soudan are separated from the coast lands of the Mediterranean by the vast deserts of the Sahara, which have always opposed an insurmountable barrier to the spread of European civilisation. Here enormous tracts of arid land, there immense marshes and swampy lake districts, or high mountain ranges

covered with impervious woods, impede the progress of the traveller, and separate one nation from the other.

Along with its unfavourable geographical formation, the political condition of Africa has likewise tended to maintain its ancient barbarism. As far as history reaches into the past, slavery has been its curse, nor has it ever enjoyed the advantages of a strong and permanent government. Thus, to cite but one example, the Manganja were all formerly united under the government of their great chief Undi, whose rule extended from Lake Shirwa to the river Loangwa, but after Undi's death it fell to pieces. This has been the inevitable fate of every African empire from time immemorial. A chief of more than ordinary ability arises, and subduing all his less powerful neighbours, founds a kingdom which he governs more or less wisely, till he dies. His successor not having the talents of the conqueror cannot retain the dominion, and some of the abler or more ambitious under-chiefs set up for themselves, and in a few years the remembrance only of the empire remains. This, which may be considered as the normal state of African society, gives rise to frequent and desolating wars, and perpetuates a state of general insecurity which paralyses improvement and prevents the accumulation of wealth, that great lever of civilisation. Ignorance, superstition, intolerance are the natural consequences of the misgovernment under which Africa suffers, and contribute in their turn to maintain it. Even the most gifted nations must eventually sink under such a load of adverse circumstances, and when we recollect for how many centuries the genius of Europe languished after the fall of the Roman empire, we must not be too hasty in depreciating the natural abilities of the Negro.

A black, soft, and unctuous skin, woolly hair, thick lips, a flat nose, a retiring forehead, and a projecting maxilla, are his well-known physical characters; but both his colour and his features are considerably modified both by the climate of the land which he inhabits and the degree of civilisation he has attained. Considerable elevations of surface, as they produce a cooler temperature of the air, are also productive of a lighter-coloured skin. Thus, in the high parts of Senegambia, which fronting the Atlantic Ocean are cooled by westerly winds, we find the light copper-coloured Felatas surrounded on every

side by the darker-coloured Negro tribes inhabiting the surrounding lower countries. In the interior of Africa, the Bornui, the occupants of the low basin of Lake Tsad, are also the most like the typical Negroes of the coast. Their moral and social condition, or the degree of barbarism and civilisation in which they live, has likewise a considerable influence on the physical conformation of the Negroes. The tribes in which the distinctive marks of the race are developed in the highest degree invariably occupy the lowest grade in the scale of African humanity: they are either ferocious, barbarous, or sunk in stupidity and sloth—as, for instance, the Papels, Bal-loms, and other savage hordes on the coast of Guinea, where the slave trade was formerly carried on to a great extent, and exerted, as usual, its baneful influence. On the other hand, where we hear of a Negro state whose inhabitants have made some progress in the social arts, we constantly find their physical character considerably deviating from the strongly pronounced Negro type. The Ashantees and the Sulimas may be cited as examples. The Negroes of Guber and Haussa, where a considerable degree of civilisation was a long time dominant, are perhaps the finest race of true Negroes in all Africa. The Joloff, who, since the time of their first discovery by the Portuguese, have enjoyed a certain degree of culture, are also tall, well-made Negroes, with the nasal profile less depressed, and the lips less prominent than is the case with the more typical tribes.

The religion of Mahomet has spread over many North African countries, but Fetissism, or the adoration of natural objects, animate or inanimate, to which certain mysterious powers are attributed, is still the superstitious creed of the greater part of that continent. Anything which chances to catch hold of the fancy of a Negro may be a fetish. One selects the tooth of a dog, of a tiger, or of a cat, or the bone of a bird; while another fixes on the head of a goat, or monkey, or parrot, or even upon a piece of red or yellow wood, or a thorn branch. The fetish thus chosen becomes to its owner a kind of divinity, which he worships, and from which he expects assistance on all occasions. In honour of his fetish, it is common for a Negro to deprive himself of some pleasure, by abstaining from a particular kind of meat or drink. Thus one man eats no

goat's flesh, another tastes no beef, and a third no brandy or palm wine. By a continual attention to his fetish, the Negro so far imposes upon himself as to represent it to his imagination as an intelligent being or ruling power, inspecting his actions and ready to reward or punish. Hence, like the Russian with his image of St. Nicholas, or the ancient Roman with his household gods, he covers it up carefully whenever he performs any action that he accounts improper. The importance or value of a fetish is always estimated according to the success of its owner whose good fortune induces others to adopt it. On the contrary, when a Negro suffers any great misfortunes, he infallibly attributes it to the weakness of his fetish, which he relinquishes, and adopts another that he hopes will prove more powerful. Sometimes a whole tribe or a large district has its fetish, which is regarded as a kind of palladium upon which the safety of their country depends. Thus, at Whidah, on the coast of Ashantee, they worship as their national fetish a kind of serpent of monstrous size, which they call the grandfather of the snakes. They say that it formerly deserted some other country on account of its wickedness, and came to them, bringing good fortune and prosperity along with it. The national fetish of the Kanga is an elephant's tooth, and that of the tribe of Wawa a tiger. At Bonny divine honours are paid to huge water-lizards. Undisturbed, the lazy monsters crawl heavily through the streets, and as they pass the Negroes reverentially make way. A white man is hardly allowed to look at them, and hurried as fast as possible out of their presence. An attempt was once made to kidnap one of these dull lizard gods for the benefit of a profane museum, but the consequences were such as to prevent a repetition of the offence, for the palm oil trade was immediately stopped, and affairs assumed so hostile an aspect that the foreigners were but too glad to purchase peace with a considerable sacrifice of money and goods. When one of the lizards crawls into a house, it is considered a great piece of good fortune, and when it chooses to take a bath, the Bonnians hurry after it in their canoes. After having allowed it to swim and plunge several times, they seize it for fear of danger, and carry it back again to the land, well pleased at once more having the sacred reptile in their safe possession.

From this account of the fetishes of the Negroes, it is evident that the rudeness of their idolatry is on a level with the low state of their social condition. A victim to evil passions and to a vague and nameless awe engendered by the fantastical and monstrous character of the animal and vegetable productions around him, the Fetissist peoples with malevolent beings the invisible world, and animates material nature with evil influences. The rites of his dark and deadly superstition are all intended to avert evils from himself by transferring them to others; hence the witchcraft and magic which flow naturally from the system of demonology.

Like the Schaman of the Polar World, the Negro priest, or professional holy man, is supposed to have the power of controlling evil spirits, and founds his influence on the gross superstition and baseless fears of those who trust in his agency. His office includes many duties. He is a physician or medicine man, a detector of sorcery by means of the ordeal, a vase maker, a conjuror or augur, and a prophet.

As all diseases are attributed by the Fetissist to 'possession,' the medicine man is expected to heal the patient by casting out the devil who has entered his body and disturbs its functions. The unwelcome visitant must be charmed away by the sound of drums and dancing, and when the auspicious moment for his expulsion arrives, is enticed from the body of the possessed into some inanimate article, which he will condescend to inhabit. This may be a certain kind of bead, two or more bits of wood bound together by a strip of snake's skin, a lion's or a leopard's claw, and other similar articles, worn round the head, the arm, the wrist, or the ankle. Hence also the habit of driving nails into and hanging rags upon trees, which are considered apt places for the laying of evil spirits.

The second and perhaps the most profitable occupation of the medicine man is, the detection of sorcery. The unfortunate wretches, accused of practising the black art, are generally required to prove their innocence by submitting to various ordeals, similar to the fire tests of mediæval Europe. The commonest trial consists in the administration of some poisonous liquid, such as the red water of the Ashantees, which is extremely apt to find the accused person guilty. If he escape unhurt, however, and without vomiting, he is judged innocent.

Much dancing and singing takes place on account of his escape, and he is allowed to demand that some punishment be inflicted on his accusers, on account of the defamation. Among the Eastern Africans visited by Captain Burton, a heated iron spike driven into some tender part of the person accused is twice struck with a log of wood. The Wazaramo dip the hand into boiling water, the Waganda into seething oil, and the Wazegura prick the ear with the stiff bristles of a gnu's tail.

The crime of sorcery is usually punished by the stake; and in some parts of Eastern Africa, the roadside shows at every few miles, a heap or two of ashes with a few calcined and blackened human bones, telling the shocking tragedy that has been enacted there. The prospect cannot be contemplated without horror: here and there, close to the larger circle where the father and mother have been burnt, a smaller heap shows that some wretched child has shared its parents' terrible fate, lest growing up he should follow in their path.

In countries where a season of drought causes dearth, disease, and desolation, the rain maker or rain doctor, is necessarily a person of great consequence, and he does not fail to turn the hopes and fears of the people to his own advantage. The enemy has medicines for dispersing the clouds which the doctor is expected to attract by his more potent charms. His spells are those of fetichists in general, the mystic use of something foul, poisonous, or difficult to procure. As he is a weatherwise man, and rains in tropical lands are easily foreseen, his trickery sometimes proves successful. Not unfrequently, however, he proves himself a false prophet, and when all the resources of cunning fail he must fly for his life, from the exasperated victims of his delusion.

The holy man is also a predictor and a soothsayer. He foretells the success or failure of commercial or warlike expeditions, prevents their being undertaken, or fixes the proper time for their commencement. In one word, his influence extends over almost all the occurrences of life, and is all the greater for being based on the abject superstition of his votaries.

Prayers and sacrifices are the chief religious observances of the Pagan negroes. Like most people all over the world, they pray for health, good weather, rich harvests, or victory over their enemies. After a long continuance of dearth, the Wawas

assemble in a mourning procession before the house in which a panther is adored as a god. Howling and lamenting they represent to him their distress, and beg him to send them rain, as otherwise they must all die of hunger. The Watjas pray to the new moon to give them strength for labouring, and the Aminas go even so far as to implore their god to pay their debts.

The sacrifices or gift offerings of the Negroes generally consist of various kinds of household animals, or fruits of the earth; but in the kingdoms of Ashantee and Dahomey, human sacrifices are prevalent to a frightful extent. As the kings and black nobility ascend, after death, to the upper gods, with whom they are to enjoy eternally the state and luxury which was their portion on earth, a certain number of slaves, proportionate to their dignity, is sacrificed for the purpose of serving them in their new condition. Bowdich\* relates that the king of Ashantee, on the death of his mother, butchered no less than 3,000 victims, and on his own death this number would probably be doubled. The funeral rites of a great captain were repeated weekly for three months, and 200 persons were slaughtered each time, or 2,400 in all. These wholesale executions, the details of which are too horrible to relate, still subsist to the present day, for the negroes cling with remarkable tenacity to their ancient customs, and this is perhaps the principal obstacle to their civilization or improvement.

The belief, so common among barbarous nations, that after death the spirit of the deceased still feels the same wants as during life, and the same pleasure in their gratification, leads to similar atrocious murders in other African countries, though probably nowhere on so gigantic a scale as in Ashantee. Thus the chiefs of Unyamwesi are generally interred with cruel rites. A deep pit is sunk, with a kind of vault projecting from it; in this the corpse, clothed with skin and hide, is placed sitting, with a pot of malt liquor, whilst sometimes one, but more generally three, female slaves, one on each side and the third in front, are buried alive to preserve their lord from the horrors of solitude. The great headmen of the Wadoe are interred almost naked, but retaining their head ornaments, sitting in a shallow pit so that the forefinger can project above the ground.

\* Mission from Cape Coast Castle to Ashantee, 1819.

With each man is buried alive a male and a female slave, the former holding a bill-hook wherewith to cut fuel for his master in the cold death-world, and the latter, who is seated upon a little stool, supports his head in her lap.

Among the negroes of Bonny, on the coast of Guinea, the wants of the dead are provided for in a less inhuman manner. The wealthy oil-merchant is interred under the threshold of his door, and a small round opening left in the ground leads to the head of the corpse. On feast days large quantities of rum are poured into this opening to gratify the thirst of the deceased and give him his share of the good things of this earth, for it is supposed that in the land of spirits he still retains the same predilection for spirituous enjoyments which he frequently testified during life. The medicine men invariably attend at these interesting ceremonies, and largely participate in the libations offered to the dead.

Throughout all Negro land we find, more or less, the custom so prevalent among other barbarous nations, of painting or tattooing the body, of distending the ears, of dressing the hair in a ridiculous manner, or of wearing an extravagant quantity of worthless trinkets; but the Manganja, a negro tribe inhabiting the banks of the Shire, have adopted the same wonderful ornament, if such it may be called, which so hideously distorts the Botocude physiognomy.

The middle of the upper lip of the girls is pierced close to the septum of the nose, and a small pin inserted to prevent the puncture closing up. After it has healed, the pin is taken out and a larger one is pressed into its place, and so on successively for weeks and months and years. The process of increasing the size of the lip goes on till its capacity becomes so great that a ring of two inches in diameter can be introduced with ease. The poorer classes make the pelélé—as this absurd instrument of disfigurement is called—of hollow or of solid bamboo, but the wealthier of ivory or tin. The tin pelélé is often made in the form of a small dish; the ivory one is not unlike a napkin ring. No woman ever appears in public without the pelélé, except in times of mourning for the dead. The Manganjas no doubt see beauty in the upper lip projecting two inches beyond the tip of the nose, but to the rest of the world it is frightfully ugly. When an old wearer of a hollow bamboo-

ring smiles, by the action of the muscles of the cheek, the ring and lip outside it are dragged back and thrown above the eyebrows. The nose is seen through the middle of the ring, and the exposed teeth show how carefully they have been chipped to look like those of a cat or crocodile. When told it makes them ugly, they had better throw it away, the Manganja ladies return the same answer as their European sisters, when fault is found with a monstrous chignon or an extravagant crinoline: 'Really, it is the fashion.'

On the coast of Guinea, in the low delta of the Niger, we find the Negro inhabiting a country very different from the arid wastes in which the Bushman roams, more like a wild animal than a human creature. Here, instead of vast plains thirsting for water, numerous canals and creeks intersect the swampy soil and render the canoe as necessary to the existence of the people as the camel is to that of the Bedouins of the desert. The canoe furnishes the Bonnian with provisions from the interior of the country, it also serves to transport the palm oil which he exchanges for the commodities of Europe. This traffic, which has supplanted the old slave trade, has now lasted many years, but as yet the humanizing influence of commerce has made itself but little felt among the Bonnians whose intercourse with the white customers has only served to engraft some of the worst vices of civilized man on the brutality of the savage. Trade has indeed awakened in them the spirit of speculation, it has sharpened their intellect and rendered their manners less barbarous than those of their neighbours; but it has also taught them all the arts of deception and rendered them accomplished cheats, thieves, and liars. Of a passionate character, a trifle will provoke the most violent explosions of rage, which often lead to the use of the knife or the gun. King Peppel, one of the last sovereigns of this miserable little realm, would, without ceremony, send a bullet, the fatal messenger of his wrath, among the native crew of a canoe that was in his way or somewhat tardy in paying him the respect due to royalty.

The priest, conjurer, or medicine man still preserves an unshaken authority over the superstitious minds of the Bonnians, and appears most despicable in the character of a judge, for his verdict always inclines to the side of the party which offers

him the largest bribe, and a cruel punishment awaits the wretch who has nothing but his innocence to plead in his favour. The accused is either obliged to undergo the ordeal of swimming across a creek, where he becomes the sure prey of the alligator or the shark; or he is led to execution on a sandpit at its mouth, where he is bound at ebb tide to two poles fastened in the sand. One limb after another, proceeding from the hands and feet to the shoulders and hip joints, is now separated from the bleeding trunk which is finally hewn down from the stake. While this horrid scene is performing, the impatient alligators already protrude their monstrous jaws out of the water, and the sharks are also in attendance waiting till the returning flood brings them their share of the feast. At the next ebb the sea has washed away every trace of the disgusting spectacle.

Sometimes a cruel sacrifice is offered to the sea. As the Bonnians chiefly subsist by their trade with the Europeans, which enables them to procure provisions from the interior, the arrival of the foreign ships is to them of the greatest importance. But large vessels are in the dry season often prevented for weeks together from passing the bar by low water, fogs, calms, or contrary winds. A sufficient depth of water across the bar is therefore the great desideratum of the traders or 'gentlemen,' as they call themselves, of Bonny. To obtain this they sail with several large canoes down the river close to the bar, where they throw several of their best male and female slaves into the water as a propitiatory offering to the sea, so as to induce it to rise, or, as they call it, to make 'big water.'

The aspect of the capital town of Bonny, or Okolloma, which may contain about 5,000 souls, corresponds with the barbarous state of its inhabitants. On account of its low situation, scarcely elevated above high-water mark, the streets are constantly muddy, so that a stranger visiting the place is obliged to be carried over the worst places on the unctuous back of a negro, the only vehicle in Okolloma. The streets or rather lanes form a complete labyrinth, as every man erects his hut where he thinks proper, without any regard to regularity. The clay floor of these dwellings, which, though varying in size, are all built on the same plan, is raised about a foot above the level of the streets, and is undermined in all directions by a multitude of

burrowing crabs. The walls are generally only six or seven feet high, but the roof, thatched with palm leaves, rises without any partition twenty feet or more above the floor. Generally the hut is without any window, so that in the obscurity which reigns within, it is difficult for the stranger to find his way to the smaller rooms or compartments into which the interior is subdivided. Some gourds and water-jugs, a few cases filled with clothes, arms, and other valuables, and low wooden stools for the master and his chief attendants, form the only furniture. The dwellings of the 'gentlemen' have no more pretension to architectural beauty than those of the humblest 'freeman,' consisting merely of several of the huts above described clustered together in the strangest confusion and communicating with each other through door openings in the interior.

If idleness were bliss the tribes inhabiting the fertile Lake Regions of Central Africa must be reckoned among the happiest of mankind. Rising with the dawn from his couch of cow's hide, the negro usually kindles a fire to keep out the chill of the morning from his hay-stack hut, and addresses himself to his constant companion the pipe. When the sun becomes sufficiently powerful he removes the reed screen which forms the entrance to his dwelling, and issues forth to bask in the morning beams. After breaking his fast with a dish of porridge or curded milk, he now repairs to the Iwanza, or village 'public,' where in the society of his own sex he will spend the greater part of the day talking and laughing, smoking or indulging in copious draughts of a beer without hops, called pombe, the use of which among the negro and negroid races dates back as far as the age of Osiris. To while away the time he sits down to play at heads and tails; gambling being as violent a passion in him as with the Malay or the American Indian. Many of the Wanyamwesi have been compelled by this indulgence to sell themselves into slavery, and, after playing away their property, they even stake their aged mothers against the equivalent of an old lady in these lands—a cow or a pair of goats. Others, instead of gambling, indulge in some less dangerous employment, which occupying the hands, leaves the rest of the body and the mind at ease; such as whittling wood, piercing and airing their pipe-sticks, plucking out their beards, eye-brows, and eye-lashes, or preparing and polishing their weapons.

At noon the African returns to his hut to eat the most substantial and the last meal of the day, which has been cooked by his women. Eminently gregarious, however, he often prefers the Iwanza as a dining-room, where the company of relatives and friends adds the pleasure of society to the enjoyment of beef or mutton. With him food is the all-in-all of life—his thought by day, his dream by night. The civilised European can hardly comprehend the intense delight with which his wild brother satisfies the wants of his stomach, or the envious eye which he casts on all those who live better than himself. After eating, the East African invariably indulges in a long fit of torpidity, using the back, breast, or stomach, of his neighbour as a pillow, and awakening from his siesta, passes the afternoon as he did the forenoon, chatting, playing, smoking, and where tobacco fails, chewing sweet earth, or the clay of ant-hills. This probably contains some animal matter, but the chief reason for using it is apparently the necessity to barbarians of whiling away the time when not sleeping, by exercising their jaws. Towards sunset all issue forth to enjoy the coolness; the men sit outside the Iwanza, whilst the women and the girls, after fetching water for the household wants from the well, collect in a group upon their little stools, and indulge in the pleasures of gossip and the pipe. This delightful hour in the more favoured parts of the country is replete with enjoyment, felt by the barbarian as much as by civilised man. As the hours of darkness draw nigh, the village doors are carefully closed, and after milking his cows, each peasant retires to his hut, or passes his time squatting round the fire with his friends in the Iwanza. He has not yet learned the art of making a wick, and of filling a bit of pottery with oil. An ignited stick of some oleaginous wood, which will keep burning for a quarter of an hour with a brilliant flame, serves to light him home. Such is the African's idle day, and thus every summer is spent; but as the wintry rains draw nigh, and provisions become scarce, the necessity of providing for his daily bread suggests itself, and labour in the fields occupies a great part of the day, which would otherwise have been spent in the Iwanza.

When the moon shines bright, the spirits of the East African rise to their highest pitch, and a furious drumming, a loud clapping of hands, and a drowsy chorus summon the lads and lasses of the neighbouring villages to come out and dance.

The style of saltation usual in these parts is remarkable only for the excessive gravity which it induces, for at no other time does the East African look so serious, so full of earnest purpose, as when about to practise the art of Terpsichore. At first the dancers tramping to the measure with alternate feet, and simultaneously performing a kind of treadmill exercise, with a heavier stamp at the end of every period, sway their bodies slowly from side to side; but as excitement increases,

‘The mirth and fun grows fast and furious,’

till the assembly, with arms waving like windmills, assumes the semblance of a set of maniacs. The performance often closes with a grand promenade, all the dancers being jammed in a rushing mass, with the features of satyrs and fiendish gestures. The performance having reached this highest pitch, the song dies, and the dancers with loud shouts of laughter, throw themselves on the ground to recover strength and breath.

What a contrast to this life of easy indolence when the Negro villager, violently torn from home, is led away into hopeless slavery! This, however, is but too often his lot, for throughout the whole length and breadth of torrid Africa, from the coast of Guinea to the borders of the Nile, we almost universally find man armed against man and the stronger tribes ever ready to kidnap and capture the weaker wretches within their reach. Every year sees new gangs of slaves driven to the great mart of Zanzibar, or on their melancholy way across the desert to Chartum; every year witnesses the renewal of atrocities, which, to the disgrace of man, date back as far as the time of the Phœnicians, and may possibly outlast the nineteenth century.\*

An Egyptian Razzai, or slave-hunting expedition, after long toilsome marches across the desert or through the primeval forest, at length succeeds in surprising a Negro village. The soldiers, in whom their own sufferings have long since extinguished every spark of humanity, rush with tiger-like ferocity upon their prey; their fury spares neither age nor infancy; all who are deemed unfit for a life of bondage are mercilessly butchered. The Scheba, a heavy wooden collar, shaped like a fork, rests upon the neck of the adult captives, and prevents their escape or their desperate attempts at suicide. Being

\* Sir Bartle Frere's mission gives us reason to hope that better days are in store for the unfortunate East Africans.

neither planed nor covered with soft rags, it wears deep wounds into the skin, and causes painful ulcers which last as long as the journey, for the Scheba is not removed before the place of destination is reached. More goaded and more brutally treated than a herd of cattle, the miserable pilgrims now set forth on their eternal separation from all that rendered life of any value in their eyes. Before the burning village fades for ever from their sight, the commander orders the caravan to halt. Little cares he, if, under those smoking ruins some wounded wretch unable to move, sees the flames advance nearer and nearer to consume him; if some infant left in a conflagrated hut utters its piercing cries for help.

This is the fate of more than one village until a sufficient number of slaves has been collected, or the expedition is unable any longer to withstand the climate, or the attacks of an exasperated foe. Burning, plundering, and destroying, the soldiers return to Chartum. The caravan moves slowly. The men wounded in battle or with necks chafed by the Scheba, the poor women half-dead from thirst and hunger, the weak children cannot possibly walk fast. Brehm witnessed the arrival of a transport of Dinkh negroes at Chartum and was for weeks after haunted by the dreadful sight, the horrors of which no pen could describe, no words express. It was on January 12, 1848. Before the government house, about sixty men and women sat in a circle on the ground. All the men were shackled, the women free. Children were creeping on all fours between them. The wretches lay exposed without the least protection to the rays of the burning sun, too exhausted, too dispirited to murmur or to complain, their dull glassy eyes immovably fixed on one spot, and yet full of an indescribably mournful expression. Blood and matter issued from the wounds of the men, but no word of pity, no helping hand was there to alleviate their sufferings. Involuntarily the eye of the spectator sought out the most miserable objects of the miserable group, and found them in a mother worn down to a skeleton by despair, hunger, and fatigue, and vainly pressing her famished infant to her dried up-breast. It seemed to him as if he saw the Angel of Death hovering over the wretched pair, as if he heard the rustling of his wings, and from the bottom of his heart he prayed that God might soon send the deliverer to release them from their sufferings

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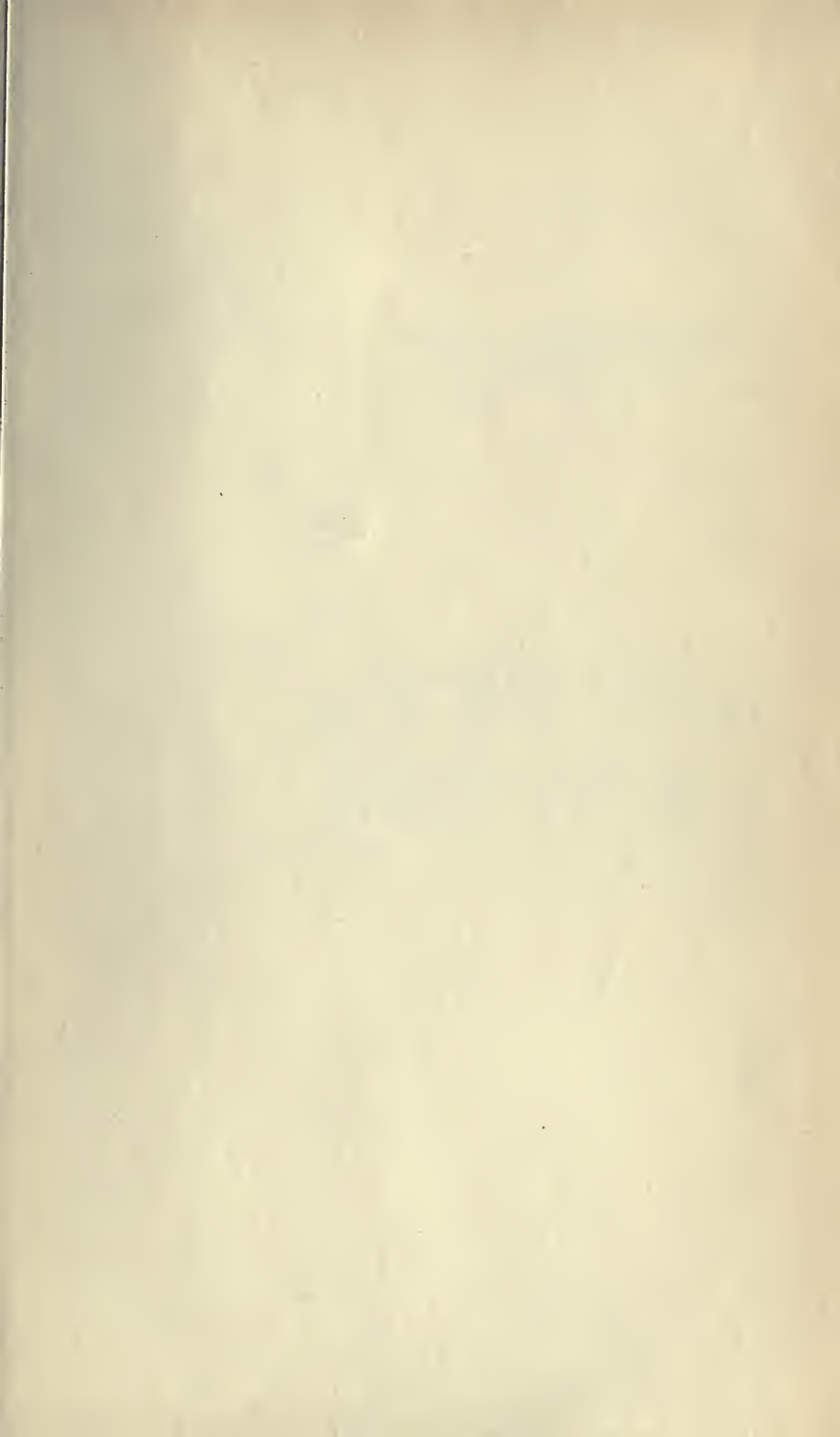
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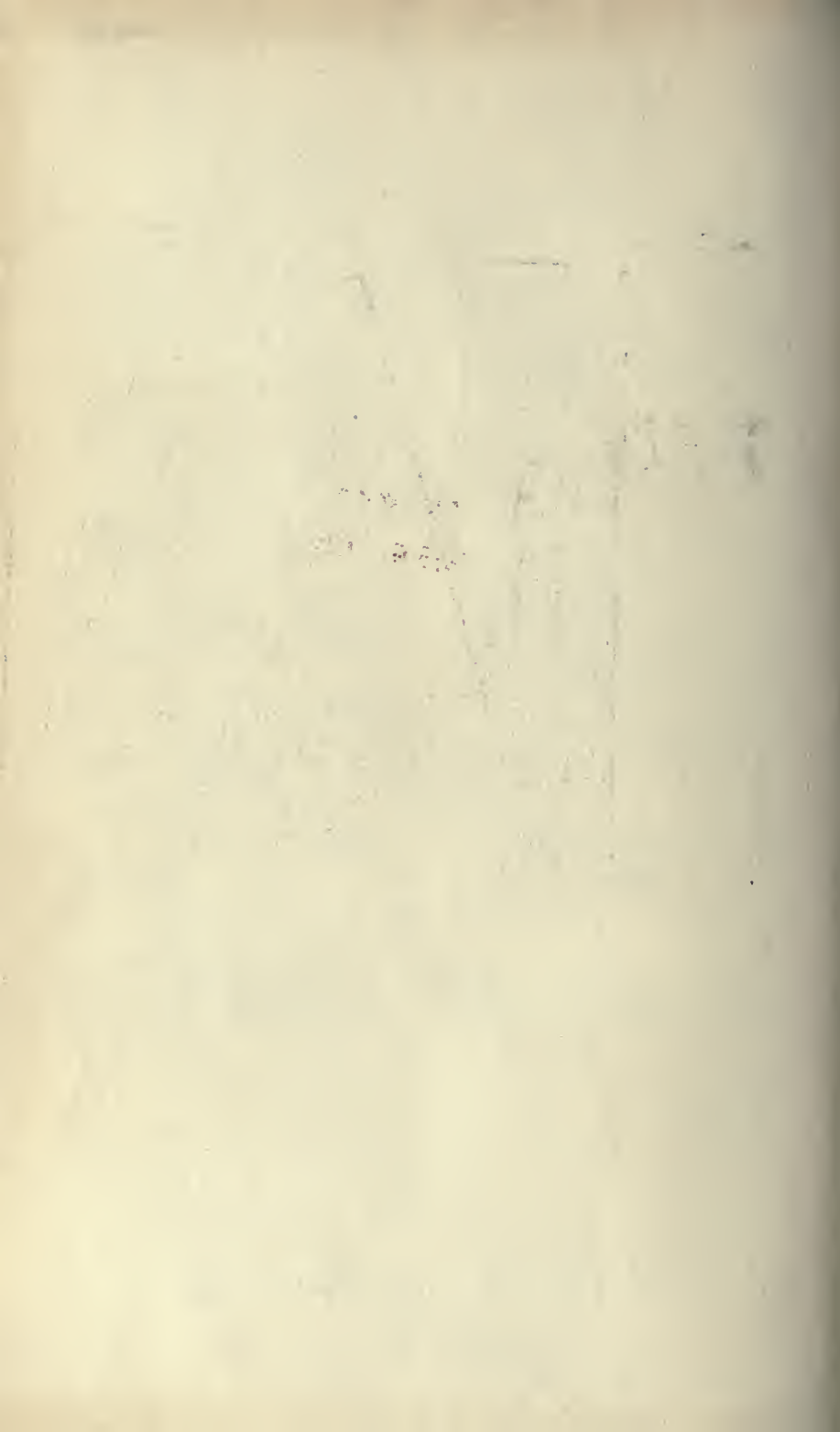
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