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Contributors

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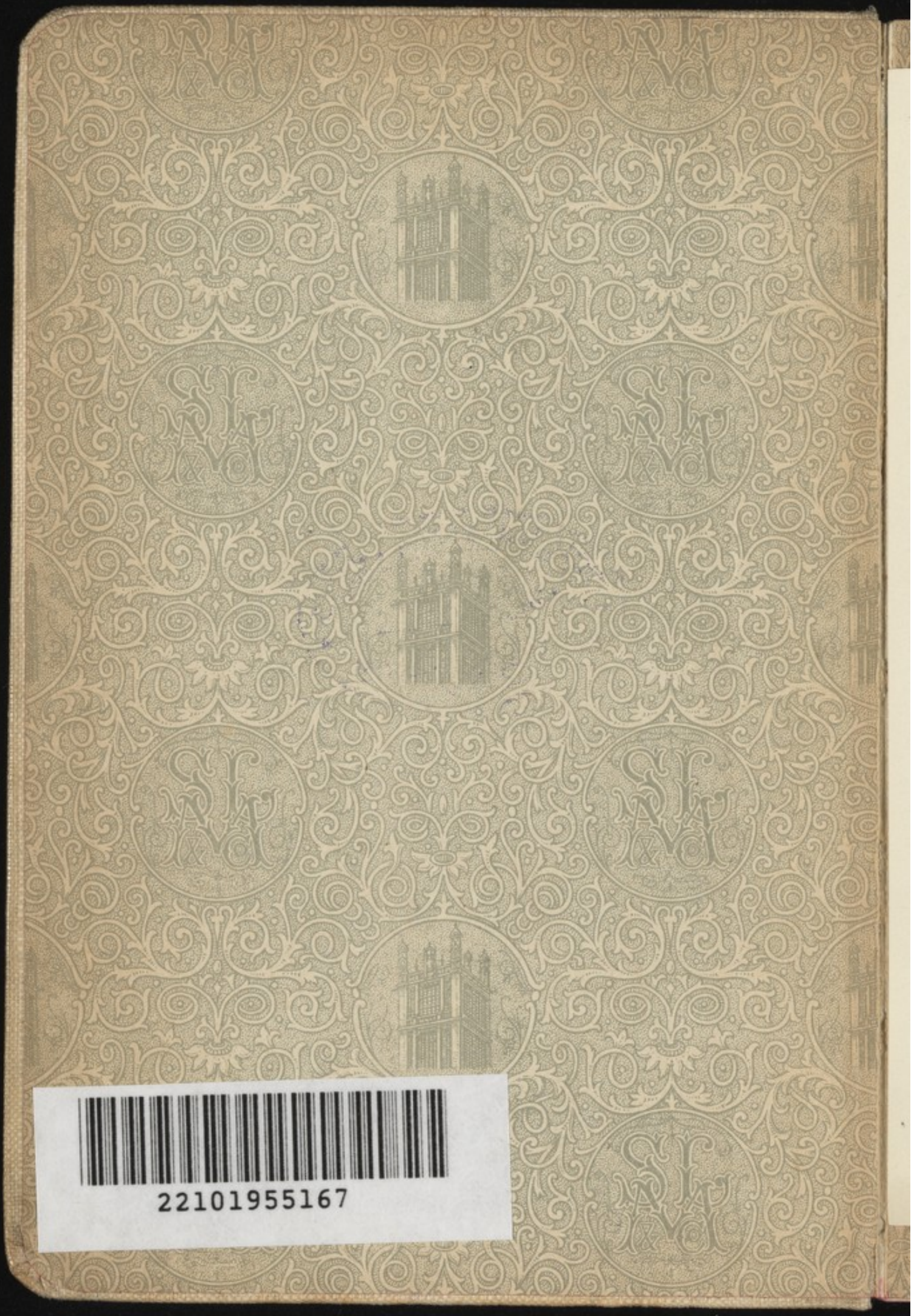
GUIDE to HEALTH in AFRICA

By

Surgeon Major T. H. Parke



Surgeon-Major Thomas Heazle Parke - 1857-1893

H.M. Stanley speaking of the events at Kavalli in 1889 said of Parke -

"This expedition possesses the rarest doctor in the world. No country in Europe can produce his equal in my opinion. There may be more learned, perhaps more skilful, but the best of them have something to learn from our doctor. He is such a combination of sweetness and simplicity; so unostentatious, so genuinely unobtrusive. We are all bound to him with cords of love, we have seen him do so much out of pure love for his "cases" that human nature becomes ennobled by this gem".

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Surgeon-Major T. H. PARKE, of the Emin Pasha Relief Expedition, reports :—

"These 'Tabloids' are soluble, and the doses accurate. Superior to any form of medicine that I have tried, not only for efficiency and constancy of strength—as I have repeatedly noticed—but also for extreme convenience of transport and rapid dispensing. These medicines are all contained in 'Tabloids,' which I have found extremely satisfactory, as they are very soluble, while they occupy very little space, and have never lost their strength. I have never used any therapeutic preparation at all so convenient or so reliable."

One of the Medicine Chests, filled with "TABLOIDS" of Compressed Drugs, supplied to H. M. Stanley by Burroughs, Wellcome & Co. and carried by Mr. Stanley throughout his Emin Pasha Relief Expedition, and brought back as a souvenir, the remaining contents unimpaired.

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SNOW HILL BUILDINGS, LONDON, E.C.

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IN DARKEST AFRICA.

In Mr. Stanley's book occurs the following passage :—

"Messrs. Burroughs, Wellcome & Co., of Snow Hill Buildings, London, E.C., the well-known chemists, furnished nine beautiful chests replete with every medicament necessary to combat endemic disease peculiar to Africa. **Every drug was in 'Tabloids' mixed with quick solvents**; every compartment was well stocked with essentials for the Doctor and Surgeon. Nothing was omitted, and we all owe a deep debt of gratitude to these gentlemen for the excellent medicines."

Mr. Stanley further states, in his "Founding of the Congo Free State :"—

"Obtain your medicine pure and well prepared. Messrs. Burroughs, Wellcome & Co. will equip you with tropic medicines in chests or cases, with supplies to last you one month or ten years. They have sought the best medical advice, and really seem disposed to study the special needs of the East, West, Central, Northern, or Southern African traveller, soldier, trader, and missionary. I have informed them of a few diseases such as have fallen under my observation, and they have prepared such medicines as have been tried during the last seventeen years of my African experiences."

Surgeon-Major T. H. Parke, D.C.L., A.M.S., Medical Officer of the Emin Pasha Relief Expedition, in his book, "My Personal Experiences in Equatorial Africa," writes :—

"The 'Tabloids' (Burroughs, Wellcome & Co.) are superior to any form of medicine that I have tried, not only for efficiency and constancy of strength—as I have repeatedly noticed—but also for extreme convenience of transport and rapid dispensing."

"I hope that the medical departments of Her Majesty's services may see their way to adopt this form of medicine. I can say with confidence—from the experience of over ten years in the medical staff of the army, both at home and abroad, in peace and war, including this expedition—that one man could carry a larger quantity and of more efficient medicine in the 'Tabloid' form than ten can manage in the present cumbersome system used by the services. If the 'Tabloid' system were only adopted on service abroad, see what a difference of transport and space there would be. These 'Tabloids' are soluble and the doses accurate: why still patronize the pill with its indefinable charm, which becomes concrete and insoluble and therefore useless, when kept a long time, and the dignified antiquity of those fluids and powders which are most difficult to pack and to dispense? But the most convincing ground of appeal to the authorities must be expenditure, for the estimates would be lessened—as one medical officer could do the work of two."

"The 'Tabloids' are very soluble, while they occupy very little space, and have never lost their strength. I have never used any therapeutic preparations at all so convenient or so reliable."

BURROUGHS, WELLCOME AND CO.,

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IN DARKEST AFRICA.

Mr. Thos. Stevens, the well-known journalist, who circled the globe on a bicycle, more recently made the great horse-back ride through Russia, and who was the first to greet Stanley as he approached the east coast of Africa on his return to civilization, was greatly impressed by the extreme portability of these "Tabloids," which enabled his own flying expedition to carry abundant supplies of medicines in small compass through his journeys for a year in Masailand and German East African territory. In his last book, "Scouting for Stanley in East Africa," he states that :—

"The 'Tabloids' were always immediately effective in breaking up the fever, as well as in curing the many ailments of the men. We cannot speak too highly of the medicines put up in the compact form of 'Tabloids.' Their extreme portability is not the least of their recommendations to the African traveller. Stanley, in recommending these medicines, has earned the gratitude of every man who goes to a tropical country. The Saccharin 'Tabloids' are especially valuable, as they have three hundred times the sweetening power of sugar."

The African Explorer, Lovett Cameron, says :—

"Anything so complete in so small and portable a shape, it is almost impossible to imagine."

Mrs. Bishop, better known as Miss Isabel Bird, whose previous record as a traveller embraces wanderings over a considerable part of the uncivilized surface of the globe, has lately returned from a trip through the wildest parts of Eastern Persia and through Kurdistan. In her book she says :—

"The remaining portion of the outfit, but not the least important, consists of a beautiful medicine chest of the most compact and portable make from Messrs. Burroughs, Wellcome & Co., containing fifty small bottles of their invaluable 'Tabloids.' The fame of Burroughs, Wellcome & Co.'s medicine chest has spread far and wide, and they think its possessor must be a Hakim."

Mr. R. Frank Rand, M.D., F.R.C.S., Principal Medical Officer of the British South African Company, reports :—

"We have had two of your Congo chests fitted with 'Tabloids' in daily use during the occupation of this country. I think it only just to tell you they have proved of inestimable service. Being quite portable, compact, and readily accessible whilst upon the march, they have saved patients and myself much time and worry.

"I know of no medicine-chest so admirably adapted to the wants of the traveller."

BURROUGHS, WELLCOME AND CO.,

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GUIDE

TO

HEALTH IN AFRICA.

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GUIDE

TO

HEALTH IN AFRICA

WITH NOTES ON THE COUNTRY AND ITS INHABITANTS.

BY

THOMAS HEAZLE PARKE,

HON. D.C.L., HON. F.R.C.S.I., ETC., ETC.,
SURGEON-MAJOR, A.M.S.,
LATE MEDICAL OFFICER TO THE EMIN PASHA RELIEF EXPEDITION.

WITH PREFACE BY

H. M. STANLEY.

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SAMPSON LOW, MARSTON & COMPANY
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PREFACE.

SURGEON-MAJOR PARKE, of the Army Medical Staff, and late medical officer of the Emin Pasha Relief Expedition, is already so well known to the reading public that any remarks from me upon his professional ability appear superfluous. The little book which he now issues as a "Guide to Health in Africa" may, however, be taken up by some one not so well acquainted with him as his merits as an able surgical operator, and medical adviser deserve. Naturally it has been as an old comrade that I have been requested to formally introduce him, and though I regard the introduction as wholly unnecessary, a sense of what is due to him from me impels me to venture upon a few remarks.

This "Guide to Health" was designed for the special benefit of travellers and residents in Africa, but, as will be seen by the "Contents," all those who reside or travel in tropical regions generally may also find it advantageous to possess it; for

many of the Diseases and Accidents treated of herein cannot be considered as peculiar to Africa. Therefore, as I think that the advice given by Dr. Parke for the prevention, cure, and the palliating of disease is wise and, as my experience has proved, correct, it ought to be welcome to an immense number of Europeans, who, in various parts of the tropic world, are debarred by circumstances from the direct ministration and assistance of the physician. I have read with care the pages relating to the "Diseases of Africa," and I must confess that I am struck with the clearness and simplicity with which he treats of them. I am something of a "doctor" myself in regard to fevers and intestinal complaints—at least, I ought to be by this—and I feel assured that the advice herein given in regard to them is particularly wise and sound.

I thought as I read these pages how often I might have been relieved of the misery of sleeplessness on my first expedition, when I was young and inexperienced, could I have possessed such a sage guide as this book. I could not help but smile at the simple remedies required to banish this terribly irritating malady. How many sufferers during the Congo Expedition might have had cause to be grateful to the Author, had he published his books, say, twelve years ago; and

how many valuable lives which succumbed to dysentery and similar diseases might have been saved!

When I think of the nine hundred and fifty Europeans at present in Congoese Africa, and the eight hundred whites in Nyassaland, German and British East and Central Africa, and of the army of pioneers advancing from the Cape towards the Zambezi, I wonder how many of them know how to distinguish between simple quotidian and the pernicious remittent fever, or between diarrhœa and dysentery, or bronchitis and pleurisy; how to ward off an attack of ague nine times out of ten; when to take quinine, and what quantity would be exactly sufficient to arrest a remittent during its treacherous remission. These are the "little tricks" or "wrinkles" which the traveller learns by dour experience, but, unfortunately, so few have survived to acquire experience, so many have become discouraged and returned home, after only a brief stay, while others have lingered ignorantly under the influence of the first attack, with liver, kidneys, and intestines terribly disordered, for want of the requisite knowledge.

Now, Dr. Parke, having endured and suffered, but survived, regards it as his bounden duty to communicate the necessary instruction to all those who, in Africa or other pestilential zones, may like to

know how to treat tropical diseases, and, oftener than not, how to avoid them. He has acquired this knowledge during five years' service in Sub-tropical, and three years' in Equatorial Africa, and as he has been so uncommonly successful in the practice of his profession during the late expedition, few men could be so well qualified as he to instruct the missionary, traveller, merchant, miner, and soldier in the "secrets" of African diseases. I am personally a witness to his excellence as a physician, and to his skill as a surgeon, and I repeat what I have said already elsewhere, that he is the cleverest of his profession that has been in Equatorial Africa, and that no expedition had more reason to be proud of its doctor than the E.P.R.E. had of Dr. Parke. He brought out all his white companions safely home, and at least thirty per cent. of the dark-faced survivors, who otherwise would have fallen victims to ulcers, etc., etc. Having carefully read the pages on tropical diseases, and examined the rules for their treatment, I can conscientiously recommend this little book to all those whose mission is in the Dark Continent, and who may want a safe medical guide.

It is one of the oddest things, and I cannot refrain from mentioning it, that Surgeon-Major Parke, who performed such splendid services in Africa, and won such general commendation from his white and

black companions, should have remained to this day so little appreciated by the Government he serves, and the Service which he adorns, as not to have received one word of thanks, or decoration, or acknowledgment from either of them. There must surely be something distinctive which could be given to such a brave and devoted man, as a sign to others that England knows how to honour a character of this rare type.

HENRY M. STANLEY.

Richmond Terrace,
Whitehall.

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GUIDE TO HEALTH IN AFRICA.

THE AFRICAN CONTINENT.

INTRODUCTORY.

The hitherto dark interior of the African continent is now being gradually opened up to the scrutinizing gaze of the civilized nations of the earth, and there is no doubt that its vast stores of unutilized productive energy will in future be objects of the greatest interest and importance to the overflowing populations of the European and American continents. In opening up the future industries of Africa, there can be no question that the English-speaking peoples will take a leading part; and the inducements held out by its mineral and vegetable wealth, and its vast stores of unused water-power, must tend to make the study of its physical and meteorological characters very desirable to the rising generation of the inhabitants of the British Islands.

The results of the discoveries of successive explorers during the past quarter of a century have given us a fairly accurate idea of the general

arrangements of land and water, of mountain and table-land, throughout the main body of the interior of the continent. The courses of its principal rivers are now sufficiently familiar, and the conditions of health and disease throughout a large proportion of the most important areas are fairly well known. In many places, of course, the observations collected have extended over but comparatively limited periods of time; still the indications derived therefrom are always instructive, and tend to show that no very mysterious problems are likely to arise in connection with the important question of the probable survival of the white man in Africa. The vaguely defined ogre of deadly disease had long been so intimately associated with the tropical regions of both sides of the continent, that it was regarded as a somewhat slower form of suicide to attempt to take up residence there. But although it still remains true that some parts of the African coast are among the most unfavourable to human life of any on the face of the earth, we now know that after passing a rather narrow belt of low-lying land, we can soon arrive at a fairly healthy and extremely fertile soil, where the rich gifts of nature can be procured with little labour, and where common sense and ordinary care can secure the enjoyment of fair health while utilizing them. The use of proper hygienic precautions can also enable the traveller to cross the deadly coast-zone in safety.

The geographical position and general contour of Africa are, of course, familiar to everybody from

the days of childhood. The reader need hardly be reminded that the "Dark Continent" is so situated as to have its surface distributed in nearly equal quantities north and south of the equator, so that a very large proportion of the whole falls within the tropics. The comparatively monotonous uniformity of its contour has, of course, the effect of greatly limiting the extent of its coast-line—so much so, that although possessed of an area about three times as large as that of the continent of Europe, the estimated length of coast-line of the latter continent is 19,000 miles, whereas that of Africa, completely surrounded as it is by sea, amounts to 15,000 miles only.

It is furnished with a goodly proportion of gigantic rivers, some of which will certainly prove of immense importance in the future navigation and commerce of the world. Its mountain ranges are not proportionally arranged on so vast a scale as the great ones of Europe and Asia, but there are many comparatively isolated chains of considerable elevation; and as the interior of the continent is, broadly speaking, one great table-land—higher in the south, and gradually declining in altitude as we proceed northwards—the net result is that the general height of the surface above the level of the sea is much greater than that of either Europe or Asia. On account of this peculiar disposition of its surface, the continent has been compared to an inverted saucer or basin; as the coast is almost everywhere nearly uniformly low, and devoid of striking features, from which a gradual ascent leads up to

an average elevation of about 3500 feet in the southern part of the continent, and about 1500 feet in the northern portion. The extreme breadth of the continent is about 5000 miles; and since the completion of the Suez Canal, it, of course, remains completely detached from the continent of Asia, to which it had been connected, as geologists tell us, since Eocene times, by the narrow Isthmus of Suez. The total area of the surface of Africa is over 11,000,000 square miles; but, as an exceptionally large proportion of the interior of this continent is covered with a hopeless desert, the amount available for the use of man is very considerably below this amount.

The geological history of Africa points to a similarly monotonous history of antique stability. Its coast-line is distinguished from that of the other continents by the very marked absence of volcanic action, and earthquake disturbances appear to be almost limited to the northern region, the Atlas range, which is, geologically speaking, more intimately connected with Europe than with the remainder of its own continent.

The main highland region of Africa extends, broadly speaking, along the eastern coast, from the southern extremity of the Red Sea to the Cape of Good Hope. It widens out as it recedes from the equator, and almost completely covers the southern extremity of the continent. From this geological backbone three limbs pass out towards the north-west, gradually fading at last into the central table-land. The hollows between these offshoots of the

great mountain-chain are occupied by the proximal portions of the courses of the great African rivers. The Nile appropriates one, while the other is shared by the Congo and the Niger. The small detached mass of highland formed by the Atlas range on the north-western coast, really forms a continuation of the Italian region of elevation, which curves sharply to the west from the southern portion of that peninsula into Sicily, and extends from the latter, under cover of the waters of the Mediterranean, to Tunis on the adjacent coast of Africa. But one active volcano is found along the line of the western coast of the continent; several are found in the eastern highlands, although none of them rival the larger ones of the other great continents. East of the basin occupied by the great central lakes are found the two culminating mountain-peaks of the continent, Kilima-Njaro and Kenia; the former attains an elevation of 18,881 feet. The Lukinga mountains separate the head-waters of the Congo and the Zambesi; while the Ulegga range further north forms the ridge of demarcation between the basins of the Congo and the Nile. The vast Sahara lowland occupies a large proportion of the northern section of the continent. Limited areas between Tunis and the Nile are as much as 167 feet below the level of the sea, and larger tracts around these depressions are at about sea-level or slightly above it. The waters of Lake Chad (Tsad) are about 800 feet above the level of the sea, and a large proportion of the surface of the Great Desert is about 1200 or 1300 feet above it.

The vast expanse of the Sahara was long supposed to be a recent marine depression, but sedimentary deposits and marine fossils of all kinds are conspicuously absent, while the prevailing formations are old sandstones, quartz, and carboniferous limestones, extensively disintegrated by weathering, so as to supply vast quantities of sandy particles, easily blown about over its otherwise naked surface by every atmospheric agitation. The Sahara is also rich in saline deposits, which, it is interesting to note, are almost entirely absent from the Soudan; and the poverty of the latter region in salt gives origin to free mercantile exchange between the two regions.

The northern mountain district of Africa, formed by the Atlas range and its spurs, has been, of course, for a considerable time pretty well known to the inhabitants of Europe. The Moorish domination of Spain has connected its historic interests with those of the adjacent continent, and the name of Atlas itself calls up classic associations in the minds of all educated persons. The next most familiar is the mountain region of Abyssinia, which is inseparably associated with the early history of Christianity, and whose modern annals are connected with those of British domination in Africa. The western, or Nigritian, mountain-chains are still in the clouds of obscurity, which have been but slowly clearing away since the period when the course and destination of the river Niger used to form the *pons asinorum* of geographers. The connection between the eastern and western mountain groups

are formed by irregular and broken lines of elevation, curving around the great lakes in their course, and often separated by very extended interruptions. The Congo mountains on the west, and the Lupata range on the east side of the continent, are among the most remarkable links in this chain towards its extremities. These groups run, however, for the most part, parallel to their respective coast-lines; and serve to separate the great ocean basins from the great central lake basin in the depths of the interior. As we trace them towards the south, their extremities are connected across the continent by a transverse range of more pronounced elevation, which includes a considerable number of peaks of very respectable altitude. The insular mountain-system related to the African continent is formed by volcanic peaks, connected by submarine ridges to the corresponding chains on the mainland.

The river-system of Africa is much more interesting and more important than is its mountain-system. Its lake-system is correspondingly remarkable, and ranks among the greatest in the world. Lake T'sad (Chad), which is found in the central depression, has had a kind of mystery attached to it for many years on account of the inaccessible position which it occupies, the consequent fewness of white travellers who had succeeded in reaching it, and the necessary imperfections of the early descriptions which had reached Europe of itself and its surroundings. At a much later date, the inhabitants of civilized countries became acquainted with the existence and the magnitude of the members of the gigantic

group which lies south of the equatorial line, and in connection with the sources of the great streams of the Nile and the Congo. The immense expanse of the Victoria Nyanza forms, after Lake Superior in North America, the largest fresh-water reservoir on the face of the earth. Speke and Grant satisfied themselves that it was without question the fountain of origin of the White Nile.

The great lake-system may be said to occupy a nuclear position among the river basins of the three great streams of the Nile, Congo, and Zambesi. This vast equatorial group includes the Victoria Nyanza, the Albert Nyanza, the Albert Edward Nyanza, Lake Tanganyika, and a number of smaller lakes. In addition to these there are, scattered over the interior of the continent, a number of reservoirs of inland drainage, which have no seaward outflow. The most extensive of these are the Lakes Tsad (Chad) and Ngami, which are symmetrically disposed on the two sides of the equator. The former of these is fed by the Shari and Komadugu streams; the latter by the Tonka. It is generally believed that the Tsad had in remote times an outlet stream to the Benue-Niger, and the Ngami to the Limpopo basin. The only considerable body of water yet discovered at a high level in Africa is the Abyssinian Lake Jana, which is found at an altitude of 6100 feet above the level of the sea, and occupies an area of about 1200 square miles.

The fact that the vicinity of the Nile was the earliest seat of human culture will always give to this historic stream an interest of unique character

for every educated traveller. The fact that the great equatorial lake-system has been entirely investigated by English-speaking travellers must always form a link of attraction between the most fertile portion of the Dark Continent and all sections of the British public, whether at home or abroad. The names of Mungo Park, Bruce, Livingstone, Speke, Burton, Baker, and Stanley must live with posterity so long as the English language and English people remain to testify to the heroic adventures of their representatives in the investigation of these previously unexplored regions. Surely the British public will reap in the near future a rich reward from the labours of these travellers, and future generations of Englishmen will recognize in these heroes some of the greatest benefactors of their race that the world has yet seen.

The area drained by the great "father of waters" is estimated at 1,500,000 square miles. The surface of its great central fountain, the Victoria Nyanza, is 26,600 square miles; being, as we have already remarked, second in size among fresh-water reservoirs only to Lake Superior itself, and occupying an area about five-sixths of that of Ireland. The fact that the Nile receives no important tributaries during a great part of its course, gives rise to the interesting peculiarity that its volume of water diminishes in the passage through Southern Egypt, and that the periodical reinforcement of its supply which it receives from the highlands of Abyssinia is absolutely essential to the fertility of this important country. Without such a factor, a great part of

the region traversed by the Nile would be as barren as the great Sahara Desert. On this account, also, the amount of water annually discharged by the Nile places it only in the twenty-seventh place among the great rivers; while, in absolute length of stream, it is now believed by some to be probably the first.

The length of the Congo is much less than that of the Nile, but the amount of water which it conveys to the sea is enormously greater; indeed, the former river probably discharges as much water as all the other African rivers taken together (Reclus). This vast stream ranks in volume next to the Amazon, and must surely figure prominently in the future commercial history of the world.

The fact that these giant watercourses of the Dark Continent have not yet eroded their rocky beds to anything like a uniform level, forms, of course, an important drawback to the utilization of their channels for the usual purposes of navigation. Had it not been for the existence of this physical difficulty, the opening up of the interior of Africa would be a simple problem indeed. Still a large proportion of the length of these great rivers is freely navigable; and, when the facilities already afforded by nature are supplemented by the efforts supplied by European enterprise and engineering skill, there is no doubt that the amount of labour and money so expended will bear rich fruit in the commercial advantages thereby attainable. The construction of some railways from the coast will, of course, form the most valuable adjunct to the use of the natural water-routes. Every traveller

who has had a glimpse of the natural resources of Uganda and the neighbouring regions in the vicinity of the central lakes, knows what a mine of wealth the making of the proposed railway from Mombasa would open up to the British public.

The Niger, which also pours its waters into the Atlantic on the western coast, possesses a basin of vast extent—little inferior, indeed, to those of the Nile and the Congo. Its course and surroundings have, up to the present, been less satisfactorily investigated than those of the other two giant streams of Africa, but there is no doubt that a very great part of its length is very fairly navigable; probably more so than in the case of either of them. An important and interesting fact connects the physical geography of all three rivers; and that is, that, as has already been pointed out by competent authorities, they could comparatively easily be connected by canalization in the interior of the continent. The Shari, which sends its waters to Lake Tsad, is separated at its origin but by a very slight water parting from the head-waters of both Nile and Congo. Lake Tsad is on the western side connected with the Niger; and the utilization of these physical facts would afford a navigable highway into the interior of the Soudan—the very heart of the Dark Continent itself. Surely this state of things in itself offers a magnificent opportunity for the exertion of British pluck and enterprise. The close central connection of these three great African rivers forms one of the most remarkable features of the hydrography of the continent.

Further south, the next African river of importance, the Zambesi, takes its head-waters from sources but slightly separated from some of the more important tributaries of the Congo. It does not, however, promise very much in the way of facilities for navigation. Still, although the existence of such a gigantic obstruction as that offered by the Victoria Falls may seem to a non-travelling reader to put the idea of navigation of this river out of the question, there can be no doubt that, if active commerce were established along its banks, the quiet portion of the stream could be utilized to a very considerable extent.

The geological structure of the African continent presents a decidedly monotonous appearance of great stability and antiquity; rather curiously comparable with the comparative sameness of its geographical outlines. Its seaboard presents very few traces indeed of upheaval or subsidence. Volcanoes and earthquakes are few and far between, and never so aggressive in their demonstrations as in the cases of the other great divisions of the earth's surface. Earthquakes are practically unheard of, except in the neighbourhood of the Atlas range, which, physically speaking, belongs rather to Europe than to Africa. Volcanic action is almost as rare, except on the line from the Comoro Islands through Masailand, and to a slight degree in the vicinity of the Bight of Biafra on the west side. The only extensive lava-fields hitherto discovered on the continent are those of the Masai plateau. Throughout the greater part of the continent the

older sedimentary rocks greatly prevail over the tertiary and quaternary formations; as the old plutonic products do, to an immense degree, over the more recent eruptive ones. Granitic features characterize Upper Egypt and Nubia, with nearly the whole of Abyssinia. The latter country presents largely superimposed strata of dolerites, trachytes, and crystalline slates; while the coast of Nubia and Upper Egypt offers a considerable admixture of old sandstones. Metamorphic rocks prevail in the Upper Congo basin, and plutonic succeed them above Stanley Pool. Carboniferous strata extend over East Africa from the equator to the Cape, while the Kamasia range, to the north-east of the Victoria Nyanza, is essentially metamorphic. The bed of the Orange River is formed by hard granite.

Having thus superficially sketched the outline physical features of the African continent, I will proceed in the following pages to give my readers a few of the principal points of interest connected with its present inhabitants and products, before proceeding to indicate their bearings on the central question of the probable health, and chances of survival, of the immigrant white man.

CLIMATE AND METEOROLOGY OF AFRICA.

From the fact that a larger proportion of the continent of Africa lies within the torrid zone than in the case of any of the other great divisions of the earth's surface, a popular idea has widely prevailed that it is by far the hottest. This notion had also infected the minds of most natural philosophers and meteorologists, when the interior of the equatorial belt of the continent was less well known than it now is. Before proceeding to indicate the characteristics of definite climate zones, I do not think that I can do better service to the general reader than by trying to eliminate this prevailing error. It can hardly be more effectively done than in the words of Mr. Henry Drummond, one of the most accomplished word-painters who has hitherto dealt with the African interior :—

"Nothing could more wildly misrepresent the reality than the idea of one's school-days that the heart of Africa is a desert. Africa rises from its three environing oceans in three great tiers, and the general physical geography of these has been already sketched—first, a coast-line, low and deadly; further in, a plateau the height of the

Scottish Grampians; further in still, a higher plateau, covering the country for thousands of miles with mountain and valley. Now fill in this sketch, and you have Africa before you. Cover the coast-belt with rank yellow grass, dot here and there a palm; scatter through it a few demoralized villages; and stock it with the leopard, the hyena, the crocodile, and the hippopotamus. Clothe the mountainous plateaux next—both of them—with endless forest; not grand umbrageous forest, like the forests of South America, nor matted jungle like the forests of India, but with thin rather weak forest, with forests of low trees, whose half-grown trunks and scanty leaves offer no shade from the tropical sun. Nor is there anything in these trees to the casual eye to remind you that you are in the tropics. Here and there one comes upon a borassus or fan-palm, a candelabra-like euphorbia, a mimosa aflame with colour, or a sepulchral baobab. A close inspection also will discover curious creepers and climbers; and among the branches strange orchids hide their eccentric flowers. But the outward type of tree is the same as we have at home—trees resembling the ash, the beech, and the elm, only seldom so large, except by the streams, and never so beautiful. Day after day you may wander through these forests with nothing except the climate to remind you where you are. The beasts, to be sure, are different, but, unless you watch for them, you will seldom see any; the birds are different, but you rarely hear them; and as for the rocks, they are our own familiar gneisses and granites, with

honest basalt-dykes boring through them, and leopard-skin lichens staining their weathered sides. Thousands and thousands of miles, then, of vast thin forest, shadeless, trackless, voiceless—forest in mountain and forest in plain,—this is East Central Africa."

This description, however, is not altogether applicable to West Central Africa, which contains a forest area of over 321,057 square miles, through which the Expedition travelled with relief to Emin Pasha, 1887–88–89, under the command of Mr. Stanley; therefore I cannot do better than quote his description. "Imagine the whole of France and the Iberian peninsula closely packed with trees, varying from 20 to 180 feet high, whose crowns of foliage interlace and prevent any view of sky and sun, and each tree from a few inches to four feet in diameter. Then from tree to tree run cables from two inches to fifteen inches in diameter, up and down in loops and festoons and W's and badly-formed M's; fold them round the trees in great tight coils, until they have run up the entire height, like endless anacondas; let them flower and leaf luxuriantly, and mix up above with the foliage of the trees to hide the sun; then from the highest branches let fall the ends of the cables reaching near to the ground by hundreds with frayed extremities, for these represent the air roots of the Epiphytes; let slender cords hang down also in tassels with open thread-work at the ends. Work others through and through these as confusedly as possible, and pendent from branch to branch—with absolute disregard of

material, and at every fork and on every horizontal branch plant cabbage-like lichens of the largest kind, and broad spear-leaved plants—these would represent the elephant-eared plant—and orchids and clusters of vegetable marvels, and a drapery of delicate ferns which abound. Now cover tree, branch, twig, and creeper with a thick moss, like a green fur. Where the forest is compact as described above, we may not do more than cover the ground closely with a thick crop of phrynia, and amoma, and dwarf bush; but if the lightning, as frequently happens, has severed the crown of a proud tree, and let in the sunlight, or split a giant down to its roots, or scorched it dead, or a tornado has been uprooting a few trees, then the race for air and light has caused a multitude of baby trees to rush upward—crowded, crushing, and treading upon and strangling one another, until the whole is one impervious bush. . . ." During the Nile Expedition for the relief of Gordon, the highest temperature registered in the shade was 120° F.; this was in March, at Tani Camp. I have myself found it 119° F. in the shade at Dongola. The lowest temperature registered in the shade was found to be 41° F. during December at Sarcomatto. Mr. Drummond, whom I have quoted, states with a degree of truth, which can hardly be sufficiently appreciated by one who has not travelled in these regions: "It is a popular mistake that the nearer one goes to the equator the temperature must necessarily increase. Were this so, Africa, which is the most tropical continent in the world, would also be the hottest;

while the torrid zone, which occupies so large a portion of it, would be almost insupportable to the European. On the contrary, the nearer one goes to the equator in Africa it becomes the cooler. The reasons for this are twofold—the gradual elevation of the continent towards the interior, and the increased amount of aqueous vapour in the air. Central Africa is from three to five thousand feet above the level of the sea. Now, for every three hundred feet of ascent the thermometer falls one degree. It is immensely cooler, therefore, in the interior than at the coast; and the equatorial zone all over the world possesses a climate in every way superior to that of the borders of the temperate region. At night, in Equatorial Africa, it is really cold, and one seldom lies down in his tent with less than a couple of blankets and a warm quilt. The heat of New York is often greater than that of Central Africa; for while in America a summer rarely passes without the thermometer reaching three figures, in the hottest month in Africa my thermometer never registered more than two on a single occasion—the highest actual point reached being 96° F. Nowhere, indeed, in Africa have I experienced anything like the heat of a summer in Malta, or even of a stifling August in Southern Germany or Italy. On the other hand, the direct rays of the sun are necessarily more powerful in Africa; but so long as one keeps in the shade—and even a good umbrella suffices for this—there is nothing in the climate to disturb one's peace of mind and body. When one really feels the high

temperature is when down with fever; or when fever, unknown to one, is coming on. Then, indeed, the heat becomes maddening and insupportable; nor has the victim words to express his feelings towards the glittering ball, whose sailing march across the burnished and veilless zenith brings him untold agony." Strangely enough, I have seen more men knocked down with sunstroke at Aldershot during one day in 1881 than I have seen during all my African experience.

There is no doubt that, generally speaking, the climate of Africa, like its outlines and its geological structure, presents less abruptness of variation—is, so to say, more homogeneous—than that of the other continents. The reason is very obvious; the greater part of its surface is limited to a single zone, and, both in that zone and without it, the African continent presents fewer abrupt elevations of surface than do the other great divisions of land. From the absence of any deep arms of the sea, the interior is subjected to very pronounced variations of temperature, both annual and diurnal. In the northern regions of Africa, the temperature has been observed to change from $-4°$ C. at six a.m. to $+42°$ C. at two p.m. As a rule, these extreme variations of temperature are observed in dry regions, and in the springtime; the lowest thermometric readings are obtained in the early morning, when the earth's surface has been cooled by nocturnal radiation; and the highest are recorded in the early afternoon, under the influence of certain winds. The effects of radiation on the temperature of the soil are

extremely marked in Northern Africa; ice has been known to form at night in the Sahara, where the scorching heat of the sand and of the wind, during the day, had been perfectly intolerable. A well-known saying of the Arabs is that "in Nubia the soil is like fire, and the wind is like flame."

I have elsewhere referred (p. 47) to the six zones into which Africa has been divided by Dutroulau; and they are, perhaps, the most convenient in a cursory examination of its climate. In the first of these, the northern juxta-tropical, or Mediterranean zone, as it may be called, the climate, especially in the more elevated portions of the surface, approaches that of the countries of Southern Europe, excepting the Egyptian portion, which, being separated from the adjacent portions of Asia only by the comparatively narrow Red Sea, possesses a more continental climate, and is subjected to greater extremes of heat and cold. Elsewhere there is a prolonged and serene summer season, a warm autumn (with few tropical storms); and two rainy seasons, winter and spring. The second, or Sahara zone, is, as everybody knows, characterized by its burning sands and its fiery winds—including the terrible Simoon, Harmattan, and Khamsin; its greater variations of diurnal temperature, its rainless days (except in winter) and its dewless nights. The absence of rainfall, which has determined its present condition of dreary waste, is due to its own low level, which gives it a very high surface temperature, combined with the fact that the prevailing winds, which carry

moisture from the sea towards the Sahara, are always robbed of it before they reach its scorching plains, by the mountainous regions which separate it from the great ocean on either side. These winds, accordingly, lose in moisture and gain in temperature as they approach the vast depression of the interior, where every factor of precipitation is removed. The third zone, which includes the great region of the Soudan, is entirely intertropical, and possesses a more characteristically equatorial climate, which is pretty similar to that of India. The spring season is distinguished by high temperatures, and frequent violent storms, which are due to the proximity of the vast desert; tornadoes and deluging rains occur in summer; while the winter is clear, calm, and fair. The fourth, or equatorial zone, includes the continental belt reaching from the Guinea Coast and the mouth of the Congo on the west, to Mozambique and Zanzibar on the east. In this zone there is, of course, great heat in the low regions near the coast. This is more pronounced on the west than on the east side of the continent. The temperature is also modified by the prevailing winds; these are always cooler on the side towards which they blow from the sea, and become warmer as they cross the broad expanse of land. The periodicity of the winds is well marked, and the rains are abundant. The latter are more copious on the eastern, and the storms are more violent on the western aspect of the equatorial zone. On passing to the south of the equator, the seasons, of course, alternate with those on the northern side. The fifth

zone is the southern desert zone, which corresponds to that of the north, although on a greatly limited scale. The sixth and last zone includes the Cape region only, the mild and healthy climate of which approximates to that of the extreme north of Africa. It has a share, too, of sudden and violent changes, which owe their origin to the mountain ranges of this section of the continent.

The hot winds of the Sahara above referred to (Khamsin, etc.) blow from the great desert to the coast. They begin in Egypt in April, in Algeria in July, in Morocco in August, and in Senegambia in November. Whirlwinds, produced by the intense heating of limited regions of the atmosphere, are of frequent occurrence in the desert regions. As they cause extremely rapid evaporation, they are, of necessity, most fatal to vegetation. The prevailing direction of winds over the great bulk of the continent is from the east. The rainy seasons are, of course, of the greatest importance in Africa. The general rule for any region is, that the rainy season commences almost immediately after the sun has reached its zenith. The heating of the mass of the atmosphere at that period, and the rapid evaporation which accompanies it, causes the ascent of vast columns of the expanding air, and the watery vapour which it includes; with the necessary consequence that the latter is rapidly precipitated in the form of rain. Accordingly, there is but a single rainy season along the equatorial line, and two in either tropical region, north and south of the line itself. Thus wet and dry seasons take the place of

the summer and winter of the temperate regions of the world; corresponding, as they do, to the hotter and cooler periods of the annual cycle. Of course, various local circumstances modify these general rules regarding their occurrence. In the northern and eastern regions they are greatly modified by the proximity of the other continents. In Southern Africa, the rainy season which follows the apparent movement of the sun northward is greater than that which follows his change of course in the opposite direction, the currents of air being in the latter case drawn from the ocean, and in the former from the broad expanse of land north of the equator. On the eastern coast-line, the rains are greatly dependent on the direction of the monsoons. There are two rainy seasons at Zanzibar, the longer one occupying the months of March, April, and May; the shorter, those of September and October. The rainy season on the east coast under the equator begins with the south-west monsoon in April, and lasts till June. There is a second, very slight in comparison, which merely consists of recurring showers, and lasts during September and October. At Lake Tanganyika, the rainy season begins in September, and lasts till May. The Abyssinian plateau has a greater rainy season lasting from June till September, and a lesser during February and April. The rains of Central Africa are always, so far as I have seen, ushered in by violent thunder-storms and tornadoes. The quantity is greatest near the equator, and diminishes as we pass north and south, till the almost rainless regions in the vicinity

of the tropical lines are reached. In the Manyuema country, Dr. Livingstone found that rains fell nearly all the year round. In the region south-west of Lake Tanganyika, he found that the rains lasted, with more or less intermission, from October till May. In the country west of the Upper Nile, the principal rainy season lasts from August till October; the slighter fall occurs in April and May. The extra-tropical sections of the continent have no defined rainy seasons. The absolute rainfall of Africa has, up to the present, been measured in very few points, so that it is not possible to draw up general laws about it.

While the climates of the extreme north and south —the Mediterranean and Cape Colony zones—of the continent of Africa are universally allowed to be healthy, there are, of course, a great many objectionable features in the climate of the intermediate portion, which includes the great bulk of the continent. Still it cannot be too strongly impressed upon the reader that it is only in the comparatively low-lying desert regions that the temperature becomes at all intolerable. The temperature of the equatorial zone of Africa, when one has passed the low level of the coast-belt, is, on account of the high level of the interior, decidedly moderate. Sunstroke appears to be very uncommon indeed. None of the white officers of the Emin Pasha Relief Expedition suffered from it, and there were very few cases indeed among the men, however much exposed. The great enemy of Central African life undoubtedly is the fever.

Every one suffers from it, both black and white. But there is no doubt that, with proper hygienic precautions, the fever nearly always terminates after a short course, and will be found to have hardly any tendency to a fatal issue, except in the cases of those whose constitutions have already been undermined by overwork, mental anxiety, or previous disease. It is met with everywhere across the continent, but is certainly most severe in its characters in the low-lying belt which fringes the coast on both east and west. It is also extremely prevalent in the vicinity of the great lakes, and in the hilly regions intervening between them and the eastern coast. This brings us to the extremely important fact, which cannot be too strongly impressed upon every African traveller, that the most fruitful cause of the development of African fever is CHILL. As we crossed the equatorial belt of Africa, *every one who got a wetting, whether by rain or by submersion in a lake or river, or who was exposed to a chilly breeze after perspiration, developed fever as an immediate consequence. Beasts as well as men suffered.* The inference is obvious.

The chilly breezes which always blow in the evenings from the surface of the waters of the Albert Nyanza developed enormous numbers of cases of fever among our men. The Egyptians, some of whom had come to look upon themselves in their own country as "fever-proof," suffered as much as any of us. *The Central African natives, who had accompanied our caravan from a distance, suffered most of all.* So that it is an established

fact that neither the colour of the skin, nor the place of nativity, nor the length of residence in Africa itself, has any effect in conferring upon anybody the slightest immunity from African fever.

THE NATIVES OF AFRICA.

THE total number of inhabitants of Africa is estimated—very roughly estimated, of course—at about 210,000,000. Of this number, it is supposed that about 175,000,000 are aborigines. Of the remainder, about 1,000,000 are European immigrants; found chiefly, of course, in the extreme north and the extreme south. The remainder are Asiatic intruders, more or less completely naturalized in the country of their adoption.

Notwithstanding the fact that the average inhabitant of the British Isles regards the name Africa as practically synonymous with Negroland, and looks upon this continent especially as the home of the "nigger," the fact remains that the aboriginal inhabitants of Africa present an enormous range of difference of complexion, stature, and general physique; a large proportion varying from the typical negro standard quite as widely as they do from some of the other families of the human race.

Friedrich Müller of Vienna, one of the most philosophical of the earlier anthropologists, recognized in the inhabitants of Africa *five* distinct races. These were: the Hottentots, occupying the extreme south and the adjacent part of the south-west;

the Kafirs, who occupied the region extending from the borders of the Hottentots to the equator and a little beyond; the Negroes, who peopled the Soudan; the Fulahs, who extended northwards to the west of the Negroes; and lastly, the "Midland Races," who occupied the intermediate regions, and were supposed to be of mongrel descent—while all the others were of autochthonous origin. Subsequent observers have modified a good deal the definitions and arrangements of the African races, but there is no doubt that Müller's views on this necessarily uncertain subject can still be strongly defended.

The following "General Scheme of all the African Races" is that adopted by Professor A. H. Keane:—

I. NEGRO AND NEGROID PEOPLES.

	Occupying the
NEGRITOS (Pigmies):	
Bushmen (San)	Kalahari Desert.
Batwas	Sankuru River, Congo Basin.
Obongos	Ogoway Basin.
Akkas	South Monbuttuland.
HOTTENTOTS (Khoi-Khoin):	
Namaqua	Great and Little Namaqua-land.
Koraqua	Upper Orange, Vaal, and Modder Rivers.
Griqua (half-castes) . . .	Griqualand West.
BANTUS:	
Zulu-Kafirs, Basutos, Bechuanas .	South from the Limpopo.
Makua, Matebele	Between Limpopo and Zambesi.
Manganja, Waiyau . . .	Lake Nyassa.
Barotse, Balua, Balunda . .	Between Zambesi and Congo.
Waswahili, Wanika, Wapokomo .	East Coast.

Waganda, Wanyamwesi, Walegga	Equatorial Lakes.
Ovaherero, Ovampo, Bacongo, Bateke, Duallo	West Coast.

SUDANESE NEGROES:

Kru, Fanti, Ashanti, Yoruba, Nepe	Upper Guinea.
Mandingan, Wolof, Bambara, Sonhrai	Senegambia.
Haussa, Batta, Kanuri, Baghirmi, Mosgu, Kanem	Central Sudan.
Maba, Nuba, Dinka, Shilluk, Bari, Monbuttu, Zandeh	Eastern Sudan.

II. HAMITIC PEOPLES.

MIXED AND DOUBTFUL HAMITES:

Fans	Ogoway Basin, thence inland.
Fulahs	West and Central Sudan.
Tibbus	East Sahara.
Agaus	Abyssinia.
Masai	Masailand.
Fellahin	Egypt.

TRUE HAMITES:

Berbers	*Shluh*	Morocco.
	Mzab, Kabyle	Algeria, Tunis.
	Tuareg	West Sahara.
Gallas, Somali, Afar (Danákil), Bejas		North-east Coast.

III. SEMITIC PEOPLES.

Arabs	Mauritania, West Sahara, Central and West Sudan.
Himyarites (Amhara, Tigré, Shoa)	Abyssinia.

Peschel referred all the natives of Africa to three simple groups: the Hottentots, the negroes, and the immigrants—who are found in the northern portions of the continent. On the other hand,

Hartmann, whose opinions have a good deal influenced scientists of recent years, regards *all* native Africans as being closely related ethnologically, probably derived originally from a common stock, and shading off by gradual degrees, with the evolutionary changes necessitated by climate, and other various surroundings. Still, his subdivisions do not differ so much from those of his predecessors as might have been expected. His most essential deviation from previously accepted notions lies in the fact that he refuses to admit the existence of any Hamito-Semitic peoples; rejecting, as he does, the idea of any considerable migrations from the Asiatic continent, except during the historic era. In the following pages, I will confine myself to mentioning some of the more interesting facts connected with the principal tribes, without the definite adoption of any existing classification, all of which will be necessarily modified with an increased knowledge of this continent.

The southern regions of Africa are occupied by two rather sharply defined native races—the Kafirs and the Hottentots. There can be no question of their aboriginal descent in either case; and the characteristics of the typical individuals of either race are very sharply contrasted. The Kafirs are distinguished by a finely developed and really warlike physique; while the Hottentots are of a decidedly weak type, and stand very low, both morally and physically. The Bushmen (Bosjesmans), as one section of the Hottentots are also called, are in many ways the lowest of the African races whose habits

have hitherto been studied. The skin is of a copper-brown colour, and has a parched feel which has been compared to that of morocco leather. The Bushman roams over the desert accompanied by his pitiful canine companion—he possesses no other domestic animals—plunders wherever he can, and leads a life little higher than that of the wild beasts around him.

The Hottentots have been placed by some observers lowest in the entire grade of human beings; this unenviable position has, however, been transferred from them to the New Hollanders and neighbouring insular peoples; but it is pretty generally allowed, even in the present state of scientific knowledge, that the Hottentots are the ugliest of all known specimens of humanity. Their mental development is excessively low; lying, theft, and sensuality are said to be their prevailing accomplishments, and, like other races very low in the evolutionary grade, they are fast fading away in the presence of the white man.

Neither Bushman nor Hottentot appear capable of settling down to any kind of continuous industry. The Hottentots have a strong liking for musical sounds, and possess really considerable linguistic talent. But their hopeless indolence, and incapability of adapting their habits to those of their civilized neighbours, appear to render them unfit for progressive development. Their language is excessively crude, and they have derived the name by which they are usually known from this fact—the word "Hottentot" signifying a stutterer. They

have no definite religious ideas, but appear to have a vague veneration for the dead. Accordingly, they have a decided fear of ghosts, and always throw a stone or a branch on a grave in passing, so that mounds of considerable size cover most of the native places of interment.

The Kafirs—which include the now familiar Zulu tribes—are possessed of a really finely developed physique, and have proved themselves, as recent history shows, very efficient soldiers. At one time their superior strength and aggressive qualities enabled them, under their warlike King Chaca (1812–1828), to conquer the whole south-eastern portion of the continent, from Mozambique to the eastern boundary of Cape Colony. The other Kafir tribes are not, as a rule, nearly so well developed as the Zulus. The thorax is comparatively narrow, and the hips projecting. Facial prognathism is usually well pronounced. The skin is dark and swarthy, the hair woolly, the cheek-bones prominent, and the space between the eyes markedly wide.

The Kafir is essentially a herdsman and a warrior, and his thoughts all radiate around these engrossing pursuits. With cattle he buys his wives, for cattle he sells his daughters, and with a present of cattle he endows his new-born child. Like most primitive individuals, he is impulsive and thoughtless. He worships his deceased ancestors, believes in ghosts and in witches, also in the transmigration of souls.

The Betchuana (or Betjuana), who occupy the large territory between the Orange River and the

Zambesi, are more poorly developed, both physically and mentally, than the Kafirs. They are chiefly hunters; they do a little in stock-raising, but, for the most part, despise agriculture. Cannibalism has prevailed among them till quite recently; and even to the present is believed by some travellers to be practised in a less obtrusive way in remote quarters. The skin of the various tribes of Betchuana-land is of a clear copper-brown colour, and the hair is short and woolly. The eyes are rather bright, and the teeth white and clean, but the general expression of the face is that of ugliness and stupidity. They are beginning to clothe themselves in European materials. They indulge greatly in smoking, in dancing, and in rude instrumental music.

The Basutos are the most powerful tribe among the eastern Betchuana, and the name is often made to include all the eastern groups. The total number of Betchuana tribes is said to be twenty-three. A local king has often as many as sixty wives. A form of circumcision is practised on children of both sexes. Infants who cut the upper teeth first are killed. They possess rude musical instruments, on which they are fond of performing. They are great believers in charms; and the magic-doctor and the rain-maker are the most important subjects in each tribe.

The Zambesi region is occupied by a great number of tribes, many of which are still very imperfectly known to Europeans. Mashonaland, which is now engaging a good share of British attention, is occupied by a weakly race, whose facial expression

resembles a good deal that of the Jews. They are chiefly occupied with agriculture, and, like many of the inhabitants of the depths of Africa, display a very remarkable degree of skill in iron-work. They are said to be as persistent in their pursuit of "baksheesh" as the Egyptians themselves.

The Makua tribe has been more fully studied than many of the remote African natives, but have a good many characteristics in common with the others. They seem to believe in one God, but pay him no reverence: all their religious attentions are exercised in warding off the attacks of the evil spirits, in whom they have absolute faith, and with whom they mediate through the intervention of the charm-doctor. They practise polygamy, and the father of the family possesses absolute power over all the members of his household. In cases of suspected crime, water and fire tests are tried; and they often discover witches, whom they burn when condemned.

As we proceed northwards towards the region of the great lakes, the great bulk of the interior is occupied by small and unimportant tribes. Uganda and its inhabitants, with its bloody despotism and large standing army, forms the only considerable power. Its inhabitants are in many ways child-like, and even timorously mild in their ways; but they are impulsive and superstitious, and can easily be led to any acts of cruelty. They are fairly well formed, but, as they paint themselves plentifully with clay and ochre, the natural colour of the skin is not usually discernible.

The Manyuema, who are widely distributed in the interior, are really an extremely well-formed and handsome race of people; but I am obliged to add that, personally, I found their moral qualities the most objectionable of those of any of the aboriginal tribes whom I have met.

The western portion of Central Africa—from Lake Tanganyika to the mouth of the Congo—is occupied by comparatively unimportant tribes, who live under the absolutely despotic power of their kings or chiefs. Their trading instincts are very quick; they are usually very proud, punctilious, and irritable—qualities which keep them at continual hostility with one another, and which have, at least, the good effect of making the African interior more easily explored than it otherwise could be. Near the west coast they are idolaters; but, so far as I have seen, all ideas of worship of anything appear to fade away as the traveller passes towards the centre of the continent. Here cannibalism still prevails, although it has disappeared from the regions near the coast. An important fact for the explorer also is that he can make himself understood in the Kiswahili language nearly all the way across Equatorial Africa.

West Central Africa possesses a comparatively thinly scattered population, with the exception of Kassongo and the vicinity of the Congo. The form of government approximates more or less completely to the patriarchal. Every village has a chief or prince, who in turn obeys a greater prince—in common with the chiefs of the other

villages, which go to make up the tribe or community. In Sunda, and in Bangala, a king governs a nation of some considerable size. Their faith in the power of magic is sufficiently evidenced by the extraordinary power of the charm-doctor. Many horrible customs still exist among these peoples. The rites connected with the death and burial of a Bangala chief present a degree of ferocity and bloodthirstiness which must be described as nothing less than demoniacal.

The *palaver* is a most important rite everywhere across the breadth of Equatorial Africa. These peoples love lengthy and complex discussions, and pay the most minute attention to all the details of most prolonged ceremonies. In conducting his part of this national institution, a white man would in most cases find himself very much deceived and disappointed if he had been previously calculating upon the element of untutored simplicity in the African savage. I can personally vouch for the fact that along the equatorial belt of the dark continent the naked or half-naked aborigines can drive as keen a bargain as is likely to be made in any part of the civilized world, and that the proceeding will be accompanied by as reckless an expenditure of language as could be heard even at an Irish fair. There is no doubt that a well-conducted palaver is almost always followed by beneficial results throughout the greater part of Africa. It is absolutely essential to the establishment of a good understanding with every native tribe, and, if followed by the operation of "blood-

brotherhood," the bond of union is as secure as an African bond can hope to be.

The broad belt of African territory which stretches from the west coast, south of the great Sahara Desert, and eastwards to the Nile territory, is known as the Soudan. As will be easily surmised, it possesses a number of different races. The aboriginal occupants are true negroes, but they have been driven in here and there by surrounding hostile tribes, so that a great deal of racial mixture is met with. The more purely negro territory stretches along the Nile from the Victoria Nyanza, and is limited southward by a tolerably straight line from the upper border of the latter lake to the Bight of Biafra. Northwards it is limited by the great Sahara Desert.

The inhabitants of this region are, as a rule, of a decidedly strong and muscular build; the stature is tall, the neck thick, strong, and rather short, the muscles of the calf of the leg poorly developed, and the foot long and broad, with a projecting heel. The skull, being markedly dolichocephalic, appears to be compressed from side to side; its bones are very thick and heavy; the brain is smaller, and its convolutions less complex, than in the case of many of the Mid-African races. The eyes are black; the nose flat, with a broad base and thick nostrils. The mouth is very large, with thick, full, projecting lips of a dark-red colour; and the teeth are usually beautifully white. Prognathism is a pronounced characteristic. The hair is short, crisp, and black, and as a rule grows on the head only; the face

produces very little in the way of beard or moustache. The skin is thicker and less sensitive than in white races; the sebaceous secretion emits a strong odour.

The mental characteristics of the negro are those of the primitive child. He is characterized by receptivity and spontaneity; yields immediately to all impulses; passes easily from foolish mirth to gloomy despair, and alternates continuously between fantastic hope and shrinking fear, the silliest prodigality and the shabbiest avarice. In early childhood he is said to be even quicker than the white of the same age, but development of his intellectual faculties appears to stop at an early date. He presents a decided talent for the acquisition of language, but never arrives at a sense of numbers. So pronounced is the latter peculiarity, that one seldom meets with an African negro who can tell his own age. He is easily overreached by a designing person who can influence his fancy or imagination; and, on the other hand, often displays extreme distrust and cunning in his dealings with strangers. His imitative powers are really amazing, and he is impulsive to the last degree; so that the remark often made that "the negro may be trained, but only rarely really educated," holds good for him in the present day, as it did in the days of British slavery.

It is near the western coast, between the rivers Senegal and Niger, that the negro type has maintained itself in greatest purity. The Wolof tribe are the sons of the soil in this part of the continent,

and its members are looked upon as the handsomest of all the negroes. The skin is extremely black. They are not only better featured, but are of larger and more graceful build than the other tribes of West Africa.

To the north-east of the territory of the Wolof are located the Serechule—the oldest tribe in this part of the continent. The meaning of this appellation is "white men," and it owes its origin to the fact that the skin is of a very much lighter colour than that of the surrounding tribes—even that of the average negro. They are supposed to have originated in a cross between the negroes proper and the Berbers. They are orderly and frugal in their habits of life, and possess a keen sense of commercial interests—a quality which has earned for them the tribal epithet of the "Jews of the Soudan."

In the neighbourhood of the Bight of Biafra the transition from the Bantu to the typical negro is marked and abrupt. The Nupe are typical negroes in feature and complexion, and are among the strongest and best built of the African natives.

The natives of the Loango coast present a type of build more closely related to the European. The figure is better formed than that of the typical negro, and is often graceful and even stately in its outlines. The hands and feet are usually small and well formed. The skin is of a pleasing brown tint, and the eyes are dark and bright; but the pronounced flatness of the nose is a disagreeable feature.

One of the most interesting, and also one of the

most important, peoples living in the lower part of the Niger basin, is the tribe of so-called Dahomey negroes. Their real name is Ffons. They are governed by a king, who possesses absolute power over the lives and property of his subjects. It has been said of this kingdom that "all men are slaves, and nearly all women wives, of the king." So far as "rights" can exist under such a government, the "rights of women" are fully recognized here. All offices are open to women, and the king's bodyguard is formed exclusively of female soldiers. Women also form a large section of the army. The Amazonian negresses are nominally wives of his majesty, but are really doomed to live in celibacy. The religion chiefly consists in worship of animals, and the principal dignitaries of the faith are females.

Many of their public rites, especially those connected with the dignity of kingship, present the most revolting brutality. The walls of his majesty's palace are adorned with human skulls. Every January there is a public festival, in connection with which forty or fifty prisoners are slain. Every year the king sprinkles the graves of his forefathers with human blood. When the king dies, a considerable number of the members of his harem are sacrificed. A reign of anarchy then follows till his successor is appointed. The royal function is not, however, without its brighter side; public festivals and dances are very common; and on such occasions his majesty of Dahomey always dances gaily before his people.

Of the inhabitants of the district of the Gold

Coast, the Ashanti are the most interesting. They are usually described as very quick of apprehension, and possessed of considerable powers of discrimination. They are among the best formed of the negro tribes. The nose is not very broad, and the lips not so thick, while the women are much handsomer than the average negro female. They do a good deal in the way of skilled manual labour; they are excellent carpet-weavers, work skilful patterns in cotton, make curious specimens of pottery, prepare leather, smelt iron, etc.; while in the way of living many enjoy a good deal of luxury. The present kingdom of Ashanti consists chiefly of a number of small principalities formerly subdued by a small central Ashanti tribe. The king is an absolute despot; the whole of the male population forms his army; everybody is a slave to him. He is continually protected by a thousand guards, and enjoys the society of over a thousand wives. They believe, like most Africans, in spirits—especially evil ones—and pay devotion to certain animals, mostly objectionable ones, such as snakes and crocodiles. They also recognize a supreme being residing in heaven, and believe in the existence of a subterranean hades. Each day of the week has two names, a masculine and a feminine. To all boys born on a certain day the masculine name is given; to all girls the feminine name of the same day. Accordingly, there are but fourteen names to choose from—seven for either sex. The laws of Ashanti are among the horrors of legal history. Every subject is the king's slave, and his authority is maintained by an organized system of

spies. When he dies, the thousand members of his bodyguard are all sacrificed, and also a great many others. Accordingly, there is no monarch more anxiously taken care of by his attendants. In all important criminal cases the king passes judgment and sentence. To the king's mother is accorded the highest national rank. Everybody maintains the same position after death, so that parting with this life is simply an emigration. Notwithstanding the brutalizing nature of their government, it is said that family affection is very strong among the Ashantis.

On the Pepper Coast is found the unique state of Liberia, the only one in Africa which is definitely modelled after the European type. It was originally founded by philanthropic Americans, with the view of establishing an African home for emancipated negroes emigrating from America. Accordingly, an attempt was made to give it a constitution modelled on that of the United States, but the success attained does not appear to have been by any means a brilliant one. Neither its prosperity nor its morals are very striking, and but few American negroes have been attracted to it.

It has been reported by reliable observers that from the Senegal to the Niger, the great social and moral problem resolves itself everywhere into the use or non-use of alcohol. The native who drinks is a sworn enemy of the Mohammedan, and easily yields to the European. The non-drinking nigger is devoted to the Prophet. A remarkable outward and physical sign of distinction between the two

great groups is displayed in the treatment of the hair. The Mohammedans (non-drinkers) shave their heads, leaving but a single tuft; the drinkers (heathen or Christian) usually wear their hair, but sometimes shave off the greater part, leaving a hirsute area in the form of a cross. The wearers of the circular and crucial tufts usually treat one another with genuine theological antagonism.

The land of the Niger is occupied by a peculiar race, the Fulah or Fulbe, which has puzzled the ethnologists not a little, but would appear to have spread westward from the Soudan, towards the Nile region. Their complexion is of a yellowish bronze or brown; with a good physique, and features approaching the Caucasian type. They are a proud race, looking down on the negro, and have all been converted to Mohammedanism. They are usually described as the best-looking people in Central Africa. They also contrast with the negro in industry, as they work at agriculture, and various handicrafts, as well as stock-raising. The country is not exclusively occupied by them, as there is a large proportion of negroes intermingled; but they constitute themselves the local aristocracy, and look down on their black neighbours. They form a number of small sultanates, and attend to the education of their children, having schools in which reading, writing, arithmetic, and Arabic are taught.

To the east of Sego, on the Niger, the Kissur tribe of negroes is met with. They are all Mohammedans—not so strict as the Fulah—and are governed by a king.

A great number of small and comparatively unimportant tribes are met with in the Soudan as we pass eastwards to the region of the Nile. This portion of Africa is, of course, much more interesting and much more important than any other portion of the broad belt of the Soudan. Its comparative familiarity to English people, however, makes it unnecessary to dwell at extra length on the peculiarities of its inhabitants. The only groups of special interest are the Nubians and the Somalis. In the vague language generally employed on the subject, the Nubians are supposed to extend as far southward as the equatorial lakes; but the true Nubians (Barabra, as they call themselves) occupy the valley of the Nile between the first and second cataracts. Physically, they are related to the negroes, but they often present points of agreement with the Fellahin. We had a Nubian contingent on the Emin Pasha Relief Expedition. They were all very large men—average height over six feet. They were not to be relied upon for long-continued physical exertion, and were of sulky, disagreeable manners. The Nubians generally are reddish-brown in colour, and the hair is black and crisp, but not exactly of the woolly negro type. They are all Mohammedans, and, accordingly, polygamy is allowed; but not practised except by those who can really afford the luxury. The girls marry between the ages of ten and twelve.

Of the Somalis we had also a small contingent in the Emin Pasha Relief Expedition. They are much smaller men than the Nubians—average height about five feet seven inches—and lithe and graceful

in their movements. They are also much quicker in intellect, and more agreeable in manners, than the Nubians. They are much lighter in colour, with crisp hair, and very sparse beard. In litheness and gracefulness of movement and outline, they present a striking contrast to the Nubians.

It is not necessary to refer to any physical peculiarities of the Egyptians, or of the natives of the northern margin of the continent.

THE FLORA OF AFRICA.

It has been estimated that not more than one-fourth of the surface of the African continent can be described as fertile soil, a goodly area of which is still occupied by the primeval forest, while the balance appears as arable land. About two-fifths is entirely desert, or occupied by a low scrub, useless alike for the nutriment of man or beast. The remainder, or rather more than a third of the surface of Africa, is a nearly treeless savanna, covered by coarse grass, and almost as unprofitable in its present condition as the naked desert itself. The continuous forest-growth is almost entirely confined to the equatorial belt, where an apparently interminable forest extends from the neighbourhood of Sierra Leone eastward—with inconsiderable breaks—to the vicinity of the great central lakes. In these forest regions abound the oil-palm (*Elais guineensis*), which yields the palm-oil of commerce, the dragon tree, the mangrove, the magnificent baobab, the musanga, the ground-nut, the ebony, the banana, the butter tree, the coffee shrub, acacias, gum trees, etc., etc. The mimosas abound towards the region of the central equatorial lakes, as the shoeless members of the Emin Pasha Relief Ex-

pedition found to their cost when they arrived there. The coffee-plant has been said to derive its name from the Kaffa country, which lies to the south of Abyssinia. The cotton-plant is indigenous to Africa; the tobacco-plant is found in abundance; the papyrus, formerly so much used for the important purpose of manuscript (whence our English word *paper*), is still found in large quantities in the region of the Upper Nile; the Graminaceæ flourish in the northern portions of the continent, and in the southern region, south of the Orange River, is found a gorgeously rich vegetation of bushes, shrubs, ferns, and heathers, rivalling in diversity and luxuriance anything to be met with in the most favoured regions of the globe.

For convenience of description of its climate and products, Dutroulau divides the surface of the African continent into six zones: (1) the juxtatropical zone inclined towards the north, which is greatly influenced by the prevailing north-west winds, the climate of which, with the partial exception of the portion next to Asia, is greatly moderated by the presence of the Mediterranean Sea, over which these winds have to pass to the land; (2) the zone which includes the great desert of Sahara, and those of Libya and Nubia, which, on account of its inland position, is subjected to much greater extremes of temperature than most other regions of the same latitude; (3) the zone of the Soudan, which is wholly intertropical, and possesses a climate fairly similar to that of India; (4) the equatorial zone proper, which stretches from the maritime

regions of Guinea and the Congo on the west, to Mozambique and Zanzibar on the east coast; (5) the southern desert zone, similar in its prominent features to the vast desert zone of the north, but less extensive in area, less arid, and possessed of a climate which displays less extremes of temperature; and (6) the Cape zone, which has many features similar to those of the first zone, but still more temperate and more regular in its seasonal changes.

The typical zones of vegetation enumerated by Mr. A. S. White, in his book on "The Development of Africa," are four in number. As he himself says, they are thus broadly distinguishable:—(1) The Mediterranean zone; (2) Sahara Desert zone; (3) equatorial zone of tropical vegetation; and (4) savannas of South-Central and South Africa. Either of these divisions may conveniently be adopted for the primary arrangement of one's ideas on the subject, and will be found of use for future reference. Of course, it must always be remembered that, in some portions of any zone so defined, the features of the skies above and of the earth beneath will be found to vary very abruptly with some of the coexisting conditions; and that comparatively remote parts of different regions will be found to resemble one another in their climate and products more than adjacent sections of the same region.

As will be expected from the remarks already made, the vegetation of Africa, compared with that of the other great divisions of the earth's surface,

rather tends to a monotony somewhat comparable to its relative sameness of outline and altitude. There are, of course, some districts which present marked exceptions to this general rule. The northern segment of the continent, with the exception of its eastern extremity, presents a vegetation resembling that of Southern Europe; modified, of course, by the fact of its greater proximity to the tropics. The mountainous regions of Morocco present on their northern slopes imposing forests and broad and rich pasture-lands; capable, according to altitude, of yielding all the products of the southern temperate climates. Rich cereal crops are yielded to a very moderate degree of cultivation; productive vines can be grown with the greatest facility; the tobacco-plant flourishes; the cotton-tree, the indigo-plant, the date-palm, and the sugar-cane are as much at home here as in any region of the world.

When we pass the Morocco watershed and proceed down the slope of the southern aspect, we approach the broad and unproductive domain of the Sahara Desert. The region between the coast and the middle Atlas presents the best soil and most temperate climate, the cycle of seasons resembling a good deal those of the southern parts of England. As we proceed eastwards, the Mediterranean zone becomes less inviting. The trackless Lybian Desert advances to the sea-coast beside the Delta of the Nile.

Roughly speaking, the dismal sandy mantle of the desert covers the continent from east to west

between the parallels of the Red Sea. We need not examine its vegetation. It is, of course, practically nil, excepting in the scattered regions of moisture known as oases. It has been described as "the region of blind forces of heat and wind," where the traveller finds "the sky without clouds, and the sands without shadow." The Libyan Desert is the more uniformly dismal and unproductive portion of this vast region; an "ocean of sand" covers an area as large as that of European Russia, the "rollers" and "swells" being formed by the practically ceaseless movements of the sands, agitated by the prevailing north-east wind, by which they are heaped up into *dunes*, the unceasing movements of whose particles are said to be accompanied by a sound like that of a clarion. The western regions of the Sahara are by no means so desolate or devoid of vegetable life. But the movements of the sand, which may at any moment overwhelm any specimen of animal life found within its limits, render this immense region utterly unfit for cultivation or for residence.

Passing southwards, we come upon the transition band of steppe-country, producing a monotonous covering of tall grass, and yielding corn when cultivated. Park-like plains lead up to the margin of the great central forest of Africa, which completely covers the central regions of the continent; and is also represented, in broken form, from its great central nucleus nearly to either coast. In the grass plains surrounding the primeval forest, groups of acacias are a prominent feature. The

aloe plant is found in abundance in some places. Euphorbias exist in great abundance in and around the forest. The colossal baobab is a characteristic growth of the equatorial zone of Africa. The Congo basin, as might be expected, is for the most part very rich in vegetation. Beautiful mangrove woods abound as we pass inwards from the Congo's mouth. The prairies abound in clumps of tall and handsome trees, and the earth's surface is brightened in the season with a profusion of yellow orchids, white Commelynæ, and rich saffron-coloured convolvuli. The prickly mimosa shrub is an abundant growth, in the interval between the forest and the Albert Nyanza.

The richness of the grass-growth on the Lower Congo has been well described by Mr. H. H. Johnston. He found the tall, waving, yellowish-green grass often reaching to a height of ten or twelve feet; covering hill and plain alike, and literally occupying the position of king of the country. In marching along the Congo, this ubiquitous growth forms a strong wall on either side of the native pathways. When a porter took it into his head to desert from the ranks of the Emin Pasha Relief Expedition, he effected his escape by taking some pains to separate the stalks of grass and wriggle in among them, where he was soon utterly beyond detection.

In the central forest all this is changed. During the passage through the greater part of its extent, neither sun nor sky was visible between the spreading leaves of the tall trees above, while the pathway

below was obstructed by a dense undergrowth, the most obstructive member of which was a thorny creeper, which spread from tree to tree; and a dozen rungs of which, of a thickness from that of a finger to that of a leg or more, had very generally to be cut away to clear the passage between. The stuffy heat and melancholy gloom, the stillness and silence of a forest camp in Equatorial Africa, is probably one of the most impressive experiences to be met with anywhere in the world.

The luxuriance of vegetable growth is continued further to the south than to the north side of the equator, and especially towards the eastern coast; as we have there a higher mean annual temperature, and a more copious rainfall.

A more restricted desert zone in the western portion of the corresponding section of the southern part of the continent forms the counterpart of the great Sahara belt in the north. Beginning towards the south-west coast, it widens as it passes eastwards, and passes by degrees into the rich pasture-lands of the Transvaal and the Orange Free State. Its areas of unproductiveness do not, however, approach in their desolation the dismal expanse of the northern desert. The southern circuits of the continent are, of course, well known to be favourable to the best products of both animal and vegetable kingdoms.

THE FAUNA OF AFRICA.

AFRICA is quite exceptionally rich in its stock of the larger quadrupeds. Among the carnivora, the tiger is notable by its absence, but magnificent specimens of the lion are found, and extending over almost the whole continent; the hyena, the leopard, the panther, the jackal, and the fox are also familiar denizens of the soil. The herbivora are magnificently represented by the hitherto inexhaustible stock of elephants—the great source of our ivory supply, and the concomitant evil of the slave trade; the rhinoceros, of which at least three species have been described; the hippopotamus; several varieties of the buffalo; the giraffe, which, elsewhere extinct, still ranges practically over the whole extent of the continent; antelopes, of which no less than fifty species peculiar to Africa have been described by exploring naturalists; also the zebra, quagga, the patriarchal wild ass of Abyssinia, and some other equidæ, which are also peculiar to this great division of the world. The camel appears to have been introduced by the Arabs. The monkey family is also very widely spread over the face of the continent, and is represented by many types: the gorilla and anthropoid

chimpanzee abound in the western section of the equatorial belt, the colobus is found in the eastern regions, and the dog-faced baboon, the Galago lemur, and the small Barbary monkey are abundantly represented.

Passing southwards from Europe, we find the Mediterranean zone—as in the case of the flora—forming a border-land or area of transition between the adjacent portions of Europe and Asia in one direction, and the deeper portions of Africa in the other. The great and practically impassable desert zone of the Sahara forms the definite line of demarcation between the haunts of the fauna of the temperate zone on the north, and those of the tropical zone on the south. The equatorial belt affords specimens of most of the important characteristic animals of Africa, a great proportion of which had become quite familiar to me in crossing the continent from the mouth of the Congo to Zanzibar (Bagamoyo). Whatever may be said about the danger of early extinction of the African elephant, I do not think there is any immediate prospect of its perishing in the mazes of the central forest. The numbers which were nearly always to be found in the vicinity of our track appeared practically inexhaustible. What was most surprising to me, however, accustomed as I used to be in my schoolboy days to regard the elephant as the emblem of clumsiness, was the extraordinary agility of his movements when freely roaming in his native forest.

It has been truly observed that Central Africa

is really the finest hunting-ground in the world. The elephant, the buffalo, the rhinoceros, the hippopotamus, the lion, the leopard, the hyena, the giraffe, the eland, and an almost unlimited number of species of small deer and antelope abound. "Hippo"-shooting is one of the great sports of the Congo. The elephant can be tracked, and lain in wait for, anywhere throughout the great forest; the deer and antelope on the plains towards the great lakes.

The dog is, of course, the friend of man in Africa as well as in other countries. Civets and beautiful little genet cats are found on the Lower Congo. The wild pig is also found, and is very much utilized by the inhabitants of the vicinity of this river. There exists also a great variety—generally very ugly, too. Dogs' flesh is considered a dainty food; so highly, indeed, is it prized, that only members of the superior sex—the male—have the privilege of partaking of it.

The hippopotamus is certainly the most dangerous quadruped—indeed, the most dangerous animal—to be found on the Congo. An enraged buffalo is the most dangerous animal to be met with on the plains—probably, indeed, the most dangerous in all Africa. It is well to remember these facts when hunting in Africa, as these are two of the animals most frequently selected for "sport." The great home of the elephant is, of course, in the primeval forest. The rhinoceros is essentially a denizen of the Zambesi and South African region. The variety of antelopes in the plains beyond the forest, and

towards the region of the great lakes, is perfectly bewildering. The giraffe, certainly one of the most remarkable of African quadrupeds, is found as far as Sahara on the north, and the limits of Cape Colony on the south. Two kinds of zebra are recognized: the zebra of the plains, which is found reaching from the Orange River to Abyssinia; and the more completely striped zebra of the mountains, which is confined to South Africa. The quagga, which is exclusively African, is practically confined to the section of the continent north of the Orange River.

Some species of Edentata are found in Africa, and are all peculiar to it. The aard-vark is burrowing in its habits, a fact which makes it a source of annoyance to the agriculturists of Cape Colony. A remarkable specimen of the mole (the Cape or gilded mole) is also found in Cape Colony. Two or three species of hedgehog are found in Africa, and a porcupine is found along the Congo. Bats and squirrels are numerous. Horses are found only in the northern and southern sections of the continent.

Among birds we find the quail, the parrot, the guinea-fowl—which we found very numerous across Equatorial Africa during the progress of the Emin Pasha Relief Expedition; also the ibis, the love-bird, the roller-bird, the sun-bird, the weaver-bird, the secretary-bird, the wax-bill, the plantain-eater, the halycon, and numerous other small birds which abound in the forests. The history and geography of the ostrich family are so familiar to all educated

persons as hardly to require special mention; it shares with the giraffe, the crocodile, and the hippopotamus the peculiarity of having made Africa its special habitat; and making its presence familiar over nearly the whole of the latitude and longitude of the African continent. The favoured residence of the "feathered camel" is always on the plains and in the sandy desert itself; it takes to the hills only when pressed by hunger. The secretary-bird is one of the most interesting of the African species. It displays the curious taste of preying upon reptiles (including snakes). It abounds near the Cape. The guinea-fowl is one of the prominent features of Equatorial Africa. The numbers of these on the plains between the central forest and the Albert Nyanza are enormous. A large proportion of the smaller birds of Africa are distinguished by the extreme brilliancy of their plumage. Among birds of prey there are large numbers of hawks, owls, kites, and vultures. The latter are decidedly useful, as in other hot countries, in disposing of carrion, and thus saving the surrounding air from the effluvia of animal decomposition.

Of the ichthyology of Africa there is but little satisfactorily known, though there is no doubt that edible fish abound almost everywhere, both in the rivers and in the great lakes.

Reptiles are abundant in Africa, but not quite so much so as in other parts of the world situated in the same latitudes. They are, as would be expected, more numerous in the forest-regions; those found in the desert are, in large proportion, only harmless

lizards, with some small venomous snakes. The frog and tortoise tribes are but sparsely represented. Among the venomous snakes found are included the ringed naja, the purple naja, the darting viper, and the horned viper (*cerastes*). The puff-adder is fairly common in the central forest.

The giant reptile of the continent is, of course, the crocodile. And abundant enough he is; there is hardly a considerable stream or lake in Africa without a full supply. As the voracity of the animal is thoroughly well known, the moral for all bathers and swimmers in Africa is obvious. When the young crocodile has escaped from the egg it has to struggle for its existence against the attacks of its hereditary enemies: the stork, the ibis, and the ichneumon, as well as, it must be added, its own unnatural male parent, who appears to disapprove of large families, and is not at all above performing the Saturn-like office of devouring its own offspring. It is said that the crocodiles of the Congo rarely do more than lop off a single limb—arm or leg—from the human victim whom they surprise in the water, leaving the maimed creature to find his way to shore as best he can. Whether this can be regarded as a redeeming feature in the detestable creature's character, I cannot undertake to decide. The natives say that they assiduously follow a storm-tossed canoe which happens to be caught in a tornado, in the hope of securing some human limbs, which appear to be regarded as tit-bits. There is no doubt, too, that the very remarkable resemblance which the crocodile, taking his siesta on the river's surface, bears to

a floating log in a similar position, is a real element of danger during careless movements on an African river. The spur-winged plover is on terms of the greatest intimacy with the crocodile, and there appear to be real grounds for the mythical-looking story that the cry of the bird warns the clumsy reptile when the latter is threatened by advancing foes. The bird is always to be seen hopping on and about its hideous patron.

Insects are excessively abundant throughout the greater part of Africa; so numerous are they in the intertropical regions, indeed, that their presence is really one of the most important factors with which the adventurous traveller has to deal in exploring the interior. The ant, the locust, the tsétsé, and the donderobo, are four of the most important denizens of the Dark Continent.

The ant is an unpleasant enemy to both man and beast; but we found that, by giving them a wide berth when on the march, they often left their biped and quadruped neighbours unmolested. When disturbed in their progress, they become very vicious and vindictive. The locust is, of course, extremely formidable to the vegetable kingdom—the green crops especially—but only indirectly to other forms of organic life. These troublesome animals are not, however, without their occasional direct uses; the officers of the Emin Pasha Relief Expedition were often glad for weeks together to make them their principal meal, after a slight toasting at the forest fire. The tsétsé fly (*Glossina morsitans*) is to some forms of animal life a most

deadly, and certainly a very mysterious, enemy. Its bite is absolutely fatal to horses, camels, oxen, sheep, and dogs; while it is quite harmless to many other animals, *e.g.* the buffalo, the zebra, the goat, the jackal, and the hyena. It is also innocuous to man. The presence of this pest in the interior of Africa is really a terrible drawback, as horses and camels can never be brought within its range without falling victims to its attacks. Its size does not differ much from that of the ordinary blue house-fly which settles upon meat at home, but its wings are proportionally larger, and overlap characteristically. There is another fly, the zebub, which is supposed to have been the one selected by Providence in the days of Pharaoh for one of the plagues of Egypt. It is not venomous, but is deservedly looked upon as a terrible nuisance in the low-lying and cultivated lands. The scorpion is another of the dreaded pests of Africa. It did not, however, give our people much trouble in crossing the equatorial zone of the continent. The insect which we were soon taught to look upon as the most vicious pest of the forest is the hornet. Its sting causes really agonizing pain, and memorable was the scene which ensued whenever the denizens of a hornet's nest turned out to interview our carriers, as they never failed to do when roused by any noise—a kind of stimulus to which they appear to be peculiarly sensitive.

DISEASES OF AFRICA.

It is almost needless to say that, to the traveller or resident in a part of the world which has hitherto enjoyed so unhealthy a reputation as tropical Africa, one of the foremost considerations which must always arise is that of combating the diseases with which he is so likely to be attacked. Having spent the greater part of my professional life in the interior of the Dark Continent, I have considerable confidence in describing the course of, and recommending the treatment which should be adopted in dealing with, the principal ailments that are likely to be met with. Accordingly, the pages of this section of the volume are devoted to a brief consideration, in each case, of the diseases and injuries most prone to befall the adventurous foreigner who attempts to make a temporary or a permanent residence in Africa. As this handbook is not specially intended for the use of medical men, I have dealt with these subjects in language as far as possible non-technical and popular, so as specially to suit the volume to the requirements of the educated layman. The medicinal preparations which I have throughout recommended are those of Messrs. Burroughs, Wellcome, and Co., as I have

found, after a varied experience of the different forms in which drugs are prepared for foreign use, that there are none which can be compared with them for convenience of portability in transit, and for unfailing reliability in strength of doses after prolonged exposure. I have always felt that the officers of the Emin Pasha Relief Expedition, one and all, owed their lives to the unchangeability of these preparations, and know that I am but fulfilling my duty to every traveller in recommending them.

I subjoin a list of the preparations which should be found in the medicine-chest of every one who is preparing for a sojourn in tropical Africa.

Aconite tincture	tabloids	5 mins.
Ammonium carbonate	„	5 grs.
Antipyrin	„	5 grs.
Arsenious acid	„	$\frac{1}{50}$ gr.
Bismuth and soda	„	bismuth subnitrate and soda bicarbonate: of each, 3 grs.
Calomel	„	1 gr.
Cascara sagrada	„	2 grs.
Cathartic compound	„	—
Chloral hydrate	„	5 grs.
Dover's powder	„	5 grs.
Ergotin	capsules	3 grs.
Ipecacuanha (powdered)	tabloids	5 grs.
Laxative vegetable	„	—
Lead and opium	„	4 grs.
Livingstone rouser	„	—
Male fern	capsules	
Morphine and atropine	„	morphine sulphate $\frac{1}{6}$ gr., and atropine sulphate $\frac{1}{185}$ gr.
Opium powder	tabloids	1 gr.
Opium tincture	„	10 mins. and 5 mins.
Pepsin	„	1 gr.

Peptonic	tabloids	
Pilocarpine	,,	$\frac{1}{10}$ gr.
Potassium permanganate	,,	2 grs.
Quinine, soluble sulphate	,,	5 grs.
Salicylate of soda	,,	5 grs.
Santonin	,,	2 grs.
Soda bicarbonate	,,	5 grs.
Soda-mint	,,	
Strychnine	,,	$\frac{1}{60}$ gr.
Sulphonal	,,	5 grs.
Tannin	,,	$2\frac{1}{2}$ grs.
Warburg tincture	,,	30 mins.
Zinc sulphate	,,	1 gr.

Alum (powdered).
Bandages.
Boracic acid (powdered).
Carbolic acid.
Carbolized oil.
Catheters.
Chlorodyne.
Enema pump.
Goggles.
Hypodermic syringe.
Ink pellets.
Iodoform.
Insect powder.
Keating's insect powder.
Lanolin.
Ligatures—sterilized catgut.
Ligatures—silk.
Linseed poultice (prepared).
Lint and gauze.
Lunar caustic (sticks).
Menthol snuff.
Mustard leaves.
Oiled silk protective.
Plaster (adhesive), tape.
Quinine and orange wine.
Saccharin (tabloids).
Scissors.
Small pocket case.
Surgical needles.
Thermometer.
Tooth instruments.
Tourniquet.
Vaccine lymph in tubes.

With the aid of a medicine-chest stored with the remedies included in the above list, the intelligent traveller will be able to deal with most symptoms of disease and injury; so far as this can be done in the absence of skilled medical and surgical advice.

We will now proceed to consider the principal

diseases and injuries which are most likely to occur during a period of tropical residence or exploration. One of the simplest of the functional disorders which often trouble the traveller, and one which proves very troublesome and depressing when not properly treated, is

Sleeplessness.

This distressing symptom is a frequent result of exposure to excessive heat; the irritation produced by the bites of mosquitoes, or other insect pests of the tropics; of the anæmia and weakness produced by malarial diseases; of injudicious eating and drinking—notably, the abuse of strong tea and coffee; of great anxiety; and even of over-fatigue. Coldness of the feet at night, after a hot day, is a notable cause of sleeplessness in many tropical regions.

In such cases the general condition of the patient nearly always requires to be specially inquired into. Regulation of food, the use of tonic medicines, careful attention to diet, free circulation of air, and the use of mosquito-curtains, will often ensure quiet sleep when the patient has not had any for weeks. The application of a hot-water bag to the feet on lying down often has a wonderfully sedative effect. In malarial cases, I have seen careful rubbing and kneading of the feet and legs produce sleep when nearly every available remedy had failed.

The best medicinal treatment for sleeplessness is the use of sulphonal, which may be administered in doses of about four tabloids before lying down.

They may be swallowed in the solid form; or, better still, after solution in warm water, which is then allowed to cool till it has become palatable.

Dyspepsia—Indigestion.

This troublesome and depressing affection is often a source of great discomfort and annoyance to the traveller. The forms in which it occurs may be conveniently classified as *acute* (sudden and temporary) and *chronic* (more or less continuous).

Attacks of acute indigestion are usually brought on by partaking of bad food—badly cooked, or partially decomposed, meat and other viands; especially when imperfectly masticated. It is also very likely to follow an over-full meal, taken after *prolonged fasting*, *excessive exertion*, or *a severe chill*. To such evils, as will be readily seen, the exploring traveller is especially liable.

The *symptoms* are—a sense of fulness and tension in the region of the stomach, sometimes amounting to severe pain, and increasing for an hour or two after eating. This is usually accompanied by sour eructations, and the development of a great quantity of flatus. Griping pains throughout the abdomen are likely to follow.

The treatment of this condition should always be commenced by emptying the stomach. Vomiting can be induced by the finger in the throat, or by drinking a glass of water with a teaspoonful of mustard stirred up in it, or by a full dose of ipecacuanha (three to six of the five-grain

tabloids crushed in water). This treatment should be repeated if necessary. The application of a large hot linseed poultice to the stomach will always be found to give much relief. A mustard-leaf, dipped in warm water, and applied to the region of the stomach till the skin has become reddened and painful, will also be found very useful. A non-irritating laxative should then be administered. For this purpose, a five-grain calomel tabloid is one of the best agents. The vegetable laxative tabloids are also excellent preparations, as they cannot salivate; which calomel sometimes does in the case of persons who are peculiarly susceptible to the influence of mercurial preparations. If flatulence tends to continue, as it frequently does, the use of the soda-mint tabloids will be found very beneficial.

So long as any tenderness remains over the pit of the stomach, solid food should be avoided; and the patient should pass gradually through a few days of light fish-diet to his usual meat-food. To aid digestion, two or three peptonic tabloids should be taken after each meal, till the functions of the stomach have been perfectly restored. If the digestion tends to remain weak, it would be very advisable to peptonize the food with Fairchild's Zymine; and this precaution is an excellent one to adopt, even when there has been no previously acute attacks, for persons with a naturally weak stomach. A glass of warm water often gives much relief.

Symptoms of indigestion tend to recur again and again, on the slightest provocation, in persons of

naturally delicate mucous membranes, and of a weakly or nervous disposition; especially when the system has been reduced by prolonged exposure to malarious influences, or to exhausting diseases causing permanent debility, or as the result of long-continued indiscretions in food and drink. The disease has then become *chronic*.

The symptoms recur after every meal, and are similar to those above described, only less severe. The patient becomes continuously conscious of the presence of his stomach. The gastric region is the seat of permanent discomfort, which is increased after each meal; and this has very generally the effect of clouding his mental faculties, and keeping him always depressed in spirits. The tongue is always more or less coated; and there is usually a tendency to constipation, which is sometimes varied with occasional attacks of diarrhœa.

In such conditions, great care should be taken with regard to the quantity and quality of the food, and the regular recurrence of the meals. The latter should always be small in quantity, of easily digestible aliments, carefully cooked; and should always be separated by intervals of about five hours at least. It would be well for a patient so afflicted always to rise from a meal with the feeling that he has not eaten quite enough. If this is continued for some time, the delicate stomach has an opportunity of acquiring a better tone. Toasted wheaten bread, egg custards, peptonized milk, and concentrated meat broths, previously strained, should be among the most frequently used articles of diet.

The use of the soda-mint and bismuth-and-soda tabloids will be found very beneficial to all persons who are prone to suffer from chronic dyspepsia.

Diarrhœa.

Diarrhœa, acute and chronic, are often among the most troublesome physical ills from which the tropical traveller may expect to suffer. The acute form generally begins suddenly, and in such cases the cause is frequently traceable to ingestion of bad food or water. When this is the case, the treatment should be commenced by the use of a laxative. The use of a calomel tabloid, or of one or two of the compound cathartic tabloids, will be followed by the evacuation of any irritating or decomposing portions of food remaining in the intestine, which is most important to secure before attempting the use of any astringents. Chill is also a common cause. Rest and hot applications to the abdominal region, as recommended in the treatment of acute dyspepsia, will always give relief.

When the attacks of diarrhœa become recurrent, there is a tendency to become *chronic;* and this should, as far as possible, be combated by extreme attention to the diet. The stools should also be carefully examined, as this may show what varieties of food the digestive system is least able to master, which can then be avoided; and also give important evidence as to the existence of any definite structural lesions of the alimentary canal. When there is a catarrhal condition of the intestine, the evacuation

will be accompanied by a good deal of mucus; and, when there is a tendency to dysenteric complication, there will be gelatinous shreds or masses, with some tingeing of blood. On the other hand, if there is no decided organic lesion, the stools will have none of these accompaniments; they will be merely fluid or semi-fluid, perhaps accompanied by portions of undigested food, or more offensive than in the healthy state. If bile is absent, as it sometimes is in cases of derangements of the liver or biliary passages, there will be a marked absence of the natural odour, which is replaced by an offensive *sour* smell; and the motions will be semi-solid, and pale in colour.

In chronic cases of diarrhœa, there is often a good deal of griping or twisting pain in the abdomen before each discharge; and there is general tenderness over the surface of the abdomen, more or less pronounced. In some cases of chronic diarrhœa, the intestinal irritation is kept up simply by the retention of some masses (often very considerable in quantity) of undigested and irritating material, the presence of which acts as a foreign body; and, by slow decomposition, introduces noxious material into the alimentary canal. Whenever there is the slightest suspicion of such a state of things, the treatment should be commenced by a full dose of castor-oil and opium.

With regard to the general treatment of cases of recurring diarrhœa, threatening to become chronic, it is very evident that it is of the first importance that the natural digestive powers, which are thus

showing evidence of weakness, should be aided as far as possible by artificial means. Two peptonic tablets or pepsin tabloids should be taken three times a day. When the diarrhœa is well established, peptonized milk should form the principal article of diet till a decided progress has become assured. Such articles of diet as fruit, condiments, jams, and vegetables generally should be rigidly excluded.

As the frequency of the motions diminishes and their character improves, the use of arrow-root, corn-flour, or banana-flour can be gradually adopted. They may be flavoured with a little nutmeg or spice, and a teaspoonful of port wine. A gradual transition to fish, and afterwards to the whiter forms of meat, when procurable, should lead slowly up to the more usual forms of a meat diet. A little brandy-and-egg mixture will, from time to time, make a useful and acceptable variety in the scale of diet, before the patient has been quite prepared for his ordinary food. In every stage, the use of peptonized articles of diet is of the greatest importance.

Dysentery.

Dysentery is a specific inflammation of the mucous (lining) membrane of the large intestine. This segment of the alimentary canal is about five feet in length. It begins in the right groin, from which it passes vertically upwards to the under surface of the liver; then turns horizontally across the abdomen to the left side, where it touches the spleen; then

descends vertically to the left groin, from which it turns downwards and backwards along the lower segment of the backbone to its termination. The inflammation which occurs in this disease begins at the lower end of the bowel, and extends upwards; in all stages of the disease its signs are most pronounced in the lower portion (*rectum*).

The disease often occurs as an epidemic, especially in malarious districts, where the worst cases are usually seen. Sporadic cases occasionally occur, especially when the individual has been exposed to depressing influences, and has been obliged to partake of bad food or water. Under such circumstances, also, exposure to damp or chill, especially after great fatigue, is very likely to be followed by dysentery. For these reasons it has always been recognized as one of the scourges of retreating armies.

The symptoms of dysentery are those of fever, following an initial rigor (shivering). The patient feels a sensation of burning heat and darting pain in the neighbourhood of the lower orifice of the bowel. This is accompanied by the feeling of the presence of something which could be voided, and which produces the continuous sensation of a desire to go to stool, which forms the most characteristic symptom of the disease. Uncomplicated cases begin with constipation, and the continual straining at stool (*tenesmus*) produces evacuation only of mucus, which soon becomes blood-stained, and afterwards mixed with shreds of mucous membrane, which have separated by ulceration or

sloughing. Some scybalæ (hardened masses of fæcal matter) also appear from time to time. The fever is but moderately high, but the patient always feels extremely depressed. The symptoms are always much better in the morning, and greatly aggravated in the evening and the early portion of the night. In bad cases, the strength soon becomes exhausted by the loss of blood, and the exertion expended in the continual straining. The separated shreds of mucous membrane give a characteristic and extremely offensive odour to the evacuations. The patient suffers a great deal (as the disease extends along the bowel) from griping pains, and there is tenderness on pressure along the course of the large intestine. The bladder is often very irritable, and micturition frequent and painful. When the evacuations of blood and mucous shreds continue for many days, the patient's strength becomes utterly exhausted; he sinks into a hopelessly weak state, and dies. In mild cases, the symptoms tend to improve from about the end of the first week, and the patient should have quite recovered in about three weeks from the date of the attack. In severe cases, on the other hand, the patient will not be quite restored to health for about two months. Cases of sporadic dysentery nearly always recover if moderate care has been taken, but in bad epidemics the mortality is often very high—even up to fifty per cent. One of the worst features of the disease is its tendency to become chronic in cases where sufficient care has not been taken after the more acute symptoms have abated.

The *treatment* of dysentery should commence with absolute rest in the recumbent position. This should be rigidly adhered to till the stools have assumed their natural healthy characteristics. When seen early and the symptoms have commenced with constipation, the bowels should be at once freely moved with a couple of table-spoonfuls of castor-oil. The abdomen should be well covered with light, hot poultices; and a dose of morphine should be given simultaneously if the pain is severe. The recognized specific treatment for dysentery in the early stage is the administration of large doses of ipecacuanha. This, of course, tends to produce sickness of stomach and vomiting, which will bring up the ipecacuanha; and the best preventive for this troublesome accident is the administration of a one-grain tabloid of opium about thirty minutes before. The ipecacuanha should then be given in doses of twenty to forty grains (four to eight tabloids) every four hours. They may be washed down with a little milk or water, but it is important to remember that much fluid should not be introduced into the stomach. When the ipecacuanha has been thus administered a few times, the stomach becomes tolerant of its presence. It is well to keep the pit of the stomach covered with a light poultice as hot as can possibly be borne. When the tenesmus has disappeared, and the motions have assumed a feculent character, the use of the ipecacuanha should be at once discontinued. Rest and careful attention to diet will, in most cases, be then sufficient to complete the cure. It is hardly

necessary to say that there is no disease in which it is of greater importance to pay the strictest attention to the use of a non-irritating diet; both during the attack, and for some time after. Carelessness in this particular has often led to the establishment of the deplorable phenomena of chronic dysentery.

If the treatment has not been commenced at an early stage of the disease, the use of ipecacuanha is not likely to give so satisfactory results. In such cases it would be better, after clearing out the intestines with castor-oil, to give the patient mild opiates every hour, or second hour; at the same time keeping the abdomen carefully poulticed as recommended above, and occasionally washing out the rectum with an enema of warm water. A morphine tabloid ($\frac{1}{8}$ gr.), previously dissolved in a little water, should be added to the enema. For administration by the mouth, lead and opium tabloids, or tabloids of Dover's powder, may be chosen —one of the former, or two of the latter, for a dose. An enema of opium, given every three or four hours (best after a movement of the bowels), will also be useful in allaying the pain and distressing tenesmus. It should be retained as long as possible; even mechanical pressure must be resorted to in order to prevent its escape. This should be omitted when the tenesmus ceases. When the acute symptoms have subsided, a slight mercurial course will be beneficial in restoring the activity of the liver, which is often suspended during the course of the severer symptoms. For this purpose,

a calomel and opium tabloid may be given every night, till the biliary straining of the motions is well established. An occasional opiate suppository will be useful, in the stage of convalescence, to soothe the irritability of the rectum, which often persists for some time.

When the disease has become chronic, a change to a favourable climate generally becomes necessary, In this state, the acute symptoms have all subsided, and the fever has disappeared; the patient generally suffers from alternate diarrhœa and constipation (till a very advanced stage has been reached); and there is continuously progressive emaciation till the body is reduced to a living skeleton, whose bones are merely held together by skin and ligament. The effects of the internal administration of medicines are generally very disappointing; but residence in a mild and healthy climate, with strict attention to a mildly nutritive and non-irritating diet, and the use of astringent enemas, are sometimes followed by a gradual recovery. Enemas of dilute solutions of nitrate of silver, two grains to the ounce of water, or sulphate of copper (of the same strength), or of acetate of lead, four grains to the ounce, or of diluted hazeline (one part to about sixteen times its bulk of water), should be frequently used. They may be given of a bulk of ten ounces (half a pint), and should be retained for some little time by mechanical pressure.

Cholera.

Of this formidable disease two varieties are usually recognized—simple cholera or choleraic diarrhœa, and Asiatic (or malignant) cholera. The former occurs as a sporadic affection; and, except in cases of persons previously debilitated, is seldom actually dangerous to life.

The terrible Asiatic cholera is often epidemic, and all epidemics are said to have their origin in India (Lower Bengal), where some cases of the disease are nearly always to be found. The great source of infection would appear to be contaminated drinking-water, and, like other epidemic diseases, its attacks are most deadly in cases of subjects who have been suffering from previous debility. These are also, as a rule, the first to be attacked by the disease, and, accordingly, the early stages of widely spread epidemics display a fearful rate of mortality.

An attack of cholera is ushered in by nausea and purging, with severe cramping pains; not only in the abdominal region, but in the legs and thighs, and sometimes affecting nearly all the muscles. The vomiting and purging rapidly increase in severity, and the patient soon sinks into a state of collapse. When the stomach and intestines have been emptied of their normal contents, the typical "rice-water" evacuations appear; in which the vomited matters are hardly distinguishable from those passed from the bowel. The surface temperature falls (the internal temperature still remains

high), the whole body shrivels, the cheeks and temples fall in, the eyes are sunken, and the voice sinks to a hoarse and hollow whisper. The surface of the tongue feels cold, the expired air feels cool to the hand, the radial pulse disappears, the secretion of urine is suppressed, although the bladder usually remains irritable, the evacuations take place involuntarily, or muy be retained, as the muscular coats of the intestines are sometimes unable to contract and expel them. On account of the loss of fluids from the system, the patient is tormented by thirst, and the blood within the vessels becomes thickened and "tarry" in consistence, so that it cannot circulate freely through the capillaries. On this account, the patient suffers greatly from dyspnœa, which is another of the most distressing symptoms in the stage of collapse.

If no reaction sets in, death generally ends the scene at an early date, often in a few hours. In tropical countries, during the prevalence of a bad epidemic, the patient sometimes is suddenly struck down by collapse, and dies within a couple of hours, without either vomiting or diarrhœa.

With regard to the *treatment* of cholera, it must be confessed that no reliable specific remedy or specific line of treatment has hitherto been discovered. Still, a great deal may be done in the way of alleviating symptoms, and much more can be done in the way of preventing the spread of the disease during the prevalence of an epidemic. In the way of prevention, good food, pure water, and healthy hygienic surroundings will be found to

prove the most effectual barriers against the progress of the disease. Cholera will never be found to take deep root in a district unless the sanitary arrangements are radically bad. Careful attention to the quality and cooking of the food, filtering of the water (with previous boiling), free circulation of fresh air, and the internal use of mild acid astringents and antiseptic remedies, are the best means to ward off an attack or to prepare the system to battle with it to the greatest advantage.

When the typical symptoms develop, the patient should at once be placed in the horizontal position between blankets, and hot-water bottles, in woollen stockings, should be applied to the feet, calves of the legs, and thighs. Hot turpentine stupes should be applied to the abdomen, and the extremities should be well rubbed with the hand. The application of hot poultices to the spine (with a little mustard on the surface) is also desirable. When the skin has been well reddened, the mustard should be omitted. Some kind of bed-pan should always be used, as the rising for the frequent evacuations rapidly exhausts the strength of the patient. The discharges should be at once disinfected and buried, and the receptacle should be thoroughly washed and disinfected before being used again.

The action of internal remedies is, it must be confessed, disappointing in the treatment of cholera. Still the use of astringents, especially opium, or lead and opium (as recommended under the head of diarrhœa), appears to be of some good. During the stage of collapse, every effort should be made to

keep up the temperature of the surface by warm applications; and all drinks and necessary nourishments should be given as hot as can be borne. Even when immediately vomited, the administration of fluid nourishment should be at once repeated. Milk and beef-tea, treated with Fairchild's Zymine, are among the best articles of diet. Black coffee in teaspoonfuls, hot toast-water, or rice-water, prepared by steeping rice which has been browned over the fire, are also useful. These should be flavoured a little with some carminative, such as oil of anise or peppermint. Alcoholic stimulants should be carefully avoided throughout the attack; they never appear to improve the heart's action, and they always increase the intestinal irritation, so that their use is decidedly mischievous. Alcohol, in the shape of equal parts of whisky and water, may be administered by hypodermic injection, in which form it will not directly affect the surface of the alimentary canal; still I must say that even in this form I have seen no permanently good results from its use. The injection of saline solutions into the veins has also been tried, and I have had recourse to it myself; the treatment is usually followed by a temporary period of reaction, but I have never seen any permanent result which could be attributed to their use. The cramps, which form one of the most distressing symptoms of the disease, are best relieved by subcutaneous injection of morphine. For this purpose, a morphine and atropine tabloid (dissolved in a syringeful of warm water) should be used. Each of these tabloids

contains $\frac{1}{8}$ gr. of morphine and $\frac{1}{100}$ gr. of atropine. Chloral is also used with good effect in hypodermic injections, but it must be very well diluted, as it will otherwise tend to produce abscesses. Three or four of the tabloids (five grains each) may be given as a dose, either by the mouth—if there is any hope of their being retained—or by hypodermic injection after solution in tepid water. If the patient appear to be rapidly sinking, and the case is becoming utterly hopeless, the hypodermic injection of whisky and water, or of ether, should certainly be resorted to repeatedly, as such treatment will then offer the last and only chance of resuscitation.

Fevers.

The characteristic fevers of tropical climates are of the so-called malarial type. Their prominent peculiarities are the occurrence of periodic intermission (or remission) and recurrence. The exact nature of the poison, whose introduction into the system causes the development of such febrile symptoms, has not yet been clearly ascertained. There is, however, no doubt that at least three distinct conditions are requisite for its development: a certain elevation of temperature, the presence of moisture, and decomposition of large quantities of vegetable matter. Under such circumstances, malarial fevers are found to develop at pretty high latitudes. In my own experience of malarial fevers in Equatorial Africa, which has been very considerable, the principal factor in their causation was,

undoubtedly, chill. Every wetting received, whether in crossing a river or swamp, or chill caused by evaporation of perspiration after severe exercise, was followed by an attack of fever. It is most severe, as a general rule, in marshy districts, as it is there that the necessary conditions are best developed. Large quantities of the poison appear to be set free when the soil is opened for tillage or drainage. It is apparently of a rather high specific gravity; it is most concentrated during the night, and at low levels; so that, in malarious districts, it is much safer to occupy the upper rooms of a house than the lower. Hills and trees appear to interrupt the poison, and so do large bodies of water, so that it is possible to have a pestilent locality separated from a healthy one at the same level by a forest, or a lake, or a river of considerable width. The fever appears to be commonest in the autumn months. Like other poisons which infect the human system, its effects are always more marked when previous debility has existed. Accordingly, travellers who have been exposed to great fatigue and mental anxiety, prolonged exposure, etc., usually suffer very severely. A person who has had it once appears to be all the more likely to suffer from it again. It is not contagious; that is to say, one person does not catch the disease from another. Exposure to the sun's rays is an exciting cause.

The more typical malarial fevers—as usually described in text-books—are of an intermittent or remittent type. An *intermittent* fever (ague) is characterized by definitely recurring periods during

which the fever is completely absent. In a *remittent* fever, the temperature undergoes periodically a considerable fall; but does not reach the normal standard till the commencement of convalescence.

In intermittent fevers, the paroxysms of fever may occur daily, when it is called *quotidian;* if they occur on alternate days, the fever is called *tertian;* if they occur every third day, the fever is called *quartan;* and so on. In the quotidian ague the paroxysm is longest, and period of intermission shortest; the general rule is that the periods vary in inverse ratio to one another.

The more typical paroxysms of ague occur in three stages—"*cold*," "*hot*," and "*sweating*." The first stage is characterized by an extreme feeling of chill, in which the patient shakes like an aspen leaf. The body shrivels up, the teeth chatter, the surface presents a "goose-skin" appearance; also there is severe headache, and pains in the back and limbs, and the temper is easily ruffled. During the whole of this time the temperature is gradually rising, and at the end of a variable period—half an hour to two hours—the hot stage commences. This begins with a cessation of the feeling of chill, and a general flushing of the whole surface. The pulse, which feels small in the first stage, becomes full and bounding, and increases in rapidity. The headache also increases, and the patient soon feels very feverish. This stage, in a well-pronounced case, lasts from four to six hours. In the third stage the febrile symptoms begin to subside, the patient feels a sense of relief, and a

copious perspiration breaks out, during which he probably goes to sleep. He generally awakes quite free from fever, but with a characteristic feeling of general soreness all over the muscles, from which he is not quite free for a considerable time.

As a general rule, the more severe a case of intermittent fever is, the longer the paroxysm lasts, and the more frequently it recurs. Accordingly, the attack is longest, and the intermission shortest, in cases of quotidian ague. In cases of malarial fevers, however, this orthodox division of the paroxysm into its stages is often not carried out. This occurs especially with regard to the cold stage, which, in my own experience, is frequently absent. The number of cases which I had to treat in the course of the Emin Pasha Relief Expedition was enormous, and the usual progress of the affection is thus described in my volume, "Personal Experiences in Equatorial Africa" (pp. 477–479): "In some of the cases of fever, the symptoms have developed quite suddenly, without any premonitory stage; this is, however, exceptional. In the great majority, the attack is preceded by general malaise, accompanied by constipation, with flatulence and eructations, dull aching pains over every muscle and bone (worst over the loins and about the knees), with severe cramps in the legs. The back-ache sometimes comes on as suddenly as if the patient had been struck heavily across the loins with a stick. At the same time there is a decided tendency to increased activity both of mind and body, with

rapid respiration, and quick, thumping action of the heart. The complexion at the very beginning looks sallow, but soon becomes florid and congested, and the eyes develop a peculiar, wild, staring, brilliant look, which is very characteristic. Pain in the temples is also an early and a prominent symptom, and it persists throughout: sometimes even till a day or two after the temperature has gone down to the normal standard. Vomiting also appears early and is very persistent; when a large quantity of biliary matter is brought up in the early (cold) stage, it often gives great relief. The crisis is sometimes accompanied by very profuse sweating, which gives extreme relief. There may be no initial shivering. The temperature sometimes falls without any sweating; but in this case the fever almost invariably returns. Sometimes the paroxysms recur with such frequency that they run into each other —intermittent then becomes remittent. This is, of course, indicative of the inception of a very large dose of the poison. The excited manner, extreme talkativeness, staring look, flushed face, and restless activity of the initial stage sometimes look actually like the early stage of alcoholic intoxication. In severe cases, where the fever approaches the continued type, the patient's frame will be found, after a couple of days, to have shrivelled, apparently, to about one-half its original bulk. Great prostration is felt, and this remains till the convalescence has been well established. The legs feel extremely weak and shaky, a symptom which also persists a good while after a bad attack. As often as not, in

the vast number of cases which occurred in Ankori, there was no third stage. The first, or cold stage, is always the shortest; the third usually the longest, when there is a third present. The blood-pressure in the renal vessels is, of course, greatly increased, as the superficial vessels are all contracted. An increased secretion, of rather low specific gravity, is the consequence. From beginning to end of the fever the tongue is nearly always coated with a whitish fur, which, as the pyrexia subsides, gradually clears off, from the tip and edges towards the base and septum. In severe cases, when the fever approaches the continued type, or when there are sharp paroxysms with short intermissions, the patient, after two or three days, usually complains a good deal of distressing tightness about the chest, or a feeling of suffocation; this is chiefly due to the enormous enlargement of the spleen. There is often a good deal of pain complained of along the course of the larger nerves (great sciatic, anterior crural, median, etc.). Towards the end of an attack the renal secretion becomes darker and mixed with bile."

The enlargement of the spleen, which is transitory in early attacks, and passes away with their subsidence, often becomes permanent when the patient has suffered from prolonged recurrences of the disease, repeated over a long period. The constitution also becomes seriously undermined; and the patient suffers from a complication of symptoms, dependent on the general anæmia and broken-down condition which results from the impregnation of the system by the poison.

With regard to the *treatment* of malarial fever, there is no disease which furnishes a better illustration of the old adage that "prevention is better than cure." Experience unmistakably indicates the great value of quinine as a prophylactic medicine, and it is equally true that when malaria has got a firm hold of the spstem the result of its use as a curative agent is often very disappointing. For that purpose it is always very desirable, on entering a malarious district, to take a five-grain quinine tabloid twice a day. The results I have myself seen from the adoption of this precaution have given me the highest opinion of its value. When the fever has actually set in, the use of quinine is not only useless in cutting short the attack, but actually aggravates the patient's distress. The use of pilocarpine at the onset of an attack—two one-tenth grain tabloids—has a very beneficial effect. It soon drenches the patient in perspiration, and often greatly mitigates the severity of the paroxysm, and shortens its duration. It is, of course, always desirable that the patient, at the appearance of the first symptoms, should take to bed and be wrapped up between warm blankets, and take warm drinks to promote the action of the skin. These should not be alcoholic, but such as hot coffee and milk, etc.

If the onset of the attack commences soon after a meal, it is always well to empty the stomach by an emetic. Tepid sponging of the surface (with vinegar and water) will greatly diminish the patient's discomfort during the hot stage, and the warm cover-

ings can be removed by degrees till a single fold of blanket is left. During the sweating stage, rapidly wiping the surface with dry warm flannel cloths is desirable; but if the patient is inclined to sleep, it is not advisable to disturb him. He should then be kept carefully covered with warm blankets so as to avoid all danger of chill.

During the intermission, quinine should be regularly administered. A full dose should be given a short time before the recurrence of the paroxysm is expected: this has often the effect of cutting it short, or rendering it abortive. Twenty grains or more—even up to sixty grains—may be used at this period. When the patient has suffered from a great number of attacks, and the poison appears to have fully impregnated the circulation, the use of quinine is often very unsatisfactory. In such cases administration of arsenic (one or two tabloids after the each meal), or of Warburg's tincture (three to six tabloids), will in very many cases be followed by beneficial results where quinine has entirely failed to effect any improvement.

As already observed, the preventive treatment of malarial fevers is of the greatest importance to every tropical traveller. The first precautionary measure should certainly be that of preserving the tone of the system, and endeavouring, by regular living and good diet, to maintain a state of general good health. With this care, and the regular use of quinine (a five-grain tabloid of the bisulphate) three or four times a day, the best hopes may be realised. The employment of the Pinol-Eucalyptia Inhaler has

also given very satisfactory results in many parts of the tropics. Directions for its use are supplied with the instrument.

Remittent Fever.

Bad cases of malarial fever, especially among new-comers to an affected district, are likely to present the remittent type. Such attacks are often very dangerous to life. The onset of the fever is likely to be more rapid than in the case of the intermittent form. The symptoms are more aggravated, and the defervescence is but partial, although there are well-pronounced recurring periods of subsidence of temperature (remissions)—which does not, however, fall to the normal standard. A well-marked case lasts from one to two weeks, sometimes months.

The onset is marked by intense sickness, accompanying a chill; the headache is very severe, and the nervous symptoms, generally, much more pronounced. There is often very severe vomiting in the beginning. As this proceeds, the ejected matters become stained with bile, sometimes with blood. Delirium is very often present. In bad cases the skin becomes jaundiced, there is marked biliary staining of the urine, the bowels are confined, and there is extreme general malaise. The remissions occur in the mornings. When the fever is not very severe, the remissions are well pronounced. It is a bad sign when the morning fall of temperature is not well marked. Very severe cases of this kind

closely resemble yellow fever in their general features and course.

The general plan of *treatment* should be similar to that recommended in bad cases of intermittent fever. The bowels should be well moved in the beginning by a full calomel purge, or by the use of a couple of the compound cathartic tabloids, or compound powder of jalap. The skin may be made to act beneficially by the aid of pilocarpine. Large doses of quinine may be given in the mornings, if the remissions are well pronounced; otherwise they are useless. When there is a tendency to sink into a state of coma, as there will be in very bad cases, free stimulation is really the only treatment which can be adopted with any hope of benefit. Nutritive broths at regular intervals—by the mouth or by the rectum—should be also administered. A blister to the nape of the neck is also of great use.

Gastro-intestinal Catarrh.

This is one of the commonest plagues of residence in many parts of the tropics. We found it one of the most frequent and troublesome forms of disease which affected the members of the Emin Pasha Relief Expedition.

It is ushered in with a slight chill, and moderate fever, with loss of appetite and digestive power; griping pains within the abdomen, and tenderness over its surface; and diarrhœa, accompanied by the discharge of a great deal of mucus. It is brought on by chill, or by partaking of bad water, badly

cooked, difficultly digestible, or partially decomposed food. The symptoms last for a variable time according to the degree of the initial chill or irritation, to the previous delicacy of the alimentary canal, the degree of vulnerability of the patient's system, and the care taken after the disease has actually set in.

The *treatment* should commence by free purgation. The earlier this is done the better, and when the case is seen at the very onset, this may have the effect (with subsequent care in diet) of cutting off its progress at once. A full dose of calomel and jalap may then be given for that purpose. Three of the laxative tabloids can be taken with the best results. If seen at a later stage, the use of castor-oil is more advisable. The subsequent treatment is carried out by the use of liquid nourishment carefully selected as recommended in the case of acute dyspepsia, with the continuous application of hot fomentations to the abdomen so long as any pain or tenderness remains, and, of course, perfect rest in the horizontal position.

Sun-stroke.

Sun-stroke, heat-apoplexy, or thermal fever, is one of the tropical ills whose name is most frequently present to the public mind. It is, of course, greatly dreaded, as it is not only very dangerous during the acute stage of the attack, but it is a disease which is extremely prone to leave behind permanent sequelæ of a very unpleasant and injurious character. Still, with a fair amount of care, it is an

affection which can, very generally, be effectively guarded against. It is by no means the inevitable result of direct exposure to the vertical rays of a tropical sun, which so many residents in temperate climates appear to believe. One very striking fact, which is permanently present to the mind of the present writer in this connection, is that he has seen more cases of sun-stroke occur during one "Field day" at Aldershot, than during seven years' medical experience of sub-tropical Africa. This single feature in the history of the distribution of sun-stroke bears most important testimony to the value of the use of precautions, which are, of course, nearly always neglected in a temperate climate.

The onset of sun-stroke, as is well known, is a consequence of exposure to the rays of the sun. The symptoms may develop at once during the exposure, but are not unfrequently postponed for some hours after. Accordingly, they sometimes develop during the night following a day's marching or other form of exposure. The patient begins to feel sick and prostrate, the skin becomes peculiarly hot and dry, and there are frequent calls to micturate. The latter is a most important premonitory symptom, which is too often neglected. He rapidly becomes heavy and comatose, and the temperature runs up to a degree seldom observed in other diseases. The thermometer frequently registers 109° or 110° F. The whites of the eyes become congested (blood-shot), the pupils are contracted, stertorous breathing sets in, and the pulse is rapid and bounding.

The *treatment* of this disease requires to be very

prompt indeed. The two most important indications are—clearing out the bowels, and cooling the body. The patient should be rapidly undressed and wrapped in a wet sheet, which is kept continually damped with cold water, while free evaporation is allowed. If ice is procurable, it should be applied to the head and upper part of the spine. A small glassful of turpentine, well beaten up with an equal quantity of olive oil, and one or two eggs, and mixed with about three-quarters of a pint of water, should be injected into the rectum with the least possible delay. The beneficial results of the treatment are indicated by gradual relaxation of the pupils, diminution of the congestion of the whites of the eyes, and the reappearance of susceptibility to pain. The repeated injection of cold water into the rectum should be employed if the case is prolonged.

In bad cases the coma sometimes lasts for a considerable time, and great watchfulness is required in the management of the case. Convulsions sometimes occur, and form a bad symptom. Recovery in such prolonged or complicated cases is seldom complete, the health and intellect being likely to remain permanently impaired.

All cases of sun-stroke should be at once removed to a temperate climate as soon as convalescence is established. Alcoholic drinks must be permanently forbidden if any bad symptoms remain. Stress must also be laid on the fact that, in the treatment of the acute symptoms of sun-stroke, no alcoholic stimulants should be administered, except in a case where

the patient is actually sinking, and there appears to be no hope if reaction cannot be rapidly brought on. It should also be mentioned that the drinking habit predisposes to attacks of sun-stroke, and also renders the chances of subsequent complete recovery less hopeful.

During the employment of the cold-water applications recommended for the acute stage, the temperature should be carefully noted all the time, because a rapid fall of temperature would indicate the onset of collapse, which would be increased by a continuation of such treatment. If the temperature in the arm-pit falls to about 100° F. or so, the use of external cold should be stopped, and warm drinks—hot coffee, etc.—given. In cases where the temperature goes on falling still lower at a rapid rate, dilute alcoholic drinks may be given in moderate quantity. The indications furnished by the pulse will also be an important guide. If it becomes suddenly slow and weak, some stimulation is absolutely necessary. Teaspoonfuls of whisky-and-water should then be given at intervals. If swallowing is found to be very difficult, the same may be given by hypodermic injection. Ether may be used in the same way. A teaspoonful given by hypodermic injection often gives the best results in cases of collapse.

Typhoid Fever.

This form of fever, like other diseases which especially affect the alimentary canal, is very fre-

quently met with in parts of the tropics, particularly in places where there is overcrowding, with bad sanitary arrangements. The acute stage lasts about three or four weeks, and in severe cases longer; but the convalescence is often very tedious.

The symptoms of this disease are often very insidious at the onset. The patient complains of being "generally out of sorts," but the commencement of the illness is hardly ever well pronounced. Some dyspepsia is generally complained of, the patient feels languid and appetite fails, there is dull headache, perhaps dull pain in the back, sometimes bleeding at the nose, and always some irregularity of the bowels. The latter condition often appears at first in the form of constipation, but when the fever has become well established, there is usually diarrhœa. The patient very frequently continues to go about for some days, and is at last forced to take to bed by gradually increasing feebleness. The mental faculties are usually fairly clear, excepting, perhaps, some slight delirium in the early part of the night. The tongue has a whitish slimy fur which does not extend to the tip and edges. The diarrhœa is characteristic, having a peculiar "pea-soup" appearance, and alkaline reaction. There is also some swelling of the abdomen, with pain, tenderness on pressure, and gurgling in the right groin. A few spots usually appear on the skin about the seventh day; they are rose-coloured, lenticular in outline, and disappear momentarily on pressure with the finger. They last but about two or three days, but are followed by others which appear in the neighbourhood, and

run a similar course. The temperature, if observed from the beginning, is found to rise gradually, with a well-marked fall in the morning and rise in the evening, so that it presents a remittent type. There is a circumscribed flush on the cheeks, and the eyes are rather bright. The temperature gradually goes up to about 104° F. or more, but the morning remissions continue. The pulse is quickened, but the degree of quickening bears a less definite relation to the rise of temperature than in other febrile diseases.

In the second week some cough is usually present. The circumscribed flush on the cheeks becomes better pronounced, the tongue becomes drier, and presents transverse fissures. The diarrhœa is likely to increase in the latter part of this week. The morning remission of temperature still characterizes the case. The pulse is apparently full, but very soft and compressible. It very frequently presents the phenomenon of dicrotism, *i.e.* it seems to give the finger a double stroke instead of a single one.

In the third week the patient's weakness increases, and the case requires the most careful continuous watching, as this is a disease in which unforeseen dangerous complications may at any moment arise.

The first internal lesion of typhoid fever is inflammation, followed by ulceration, of a portion of the intestine. This condition sets up and maintains the characteristic diarrhœa, and when the process proceeds extensively, it often leads to complete and fatal exhaustion. This ulceration sometimes extends to the coats of the blood-vessels, and may in

this way cause death by hæmorrhage. It sometimes extends through the coats of the intestine so as to cause irritation of the surrounding membrane, which thus becomes inflamed. This is a very fatal complication. The ulceration sometimes actually perforates the membrane (peritoneum), and this occurrence is almost invariably fatal.

If the case progresses favourably, the morning remissions of temperature are extremely marked in the third week. The above complications must, however, be always looked out for, as they sometimes happen in otherwise very mild cases.

In the *treatment* of typhoid fever, attention to the diet and the nursing are of an importance hardly to be equalled in other febrile diseases, important as they are in all. Purgation is not admissible, except, perhaps, in the first week, and to a very mild degree. It must be remembered that excessive diarrhœa is one of the greatest dangers of this disease, and on this account the use of animal broths must be attended with great caution. If there is much diarrhœa, beef-tea, chicken-broth, etc., must be interdicted; as they will only increase it, instead of contributing to the nourishment of the patient. In a small proportion of cases, constipation exists, and these should be treated by mild enemata.

If the temperature run up very high, and if the patient is not otherwise greatly depressed, the condition can usually be best combated by the administration of three or four tabloids of antipyrin (five grains each); followed by half this dose in about three hours or so, if the first had not a sufficiently

satisfactory effect. If, however, the patient has been previously exhausted by copious diarrhœa or other complications, the use of antipyrin is hardly desirable, and quinine or salicylate of soda may be employed instead. Sleeplessness is a serious symptom, and should always be carefully treated. A couple of chloral tabloids (five grains each) may be given at night, and will usually have the desired effect. If the temperature is very high, tepid sponging of the surface will sometimes have the effect of securing a quiet night. Diarrhœa should hardly be checked except the motions exceed four per diem. Warm applications—cloths (preferably flannel) wrung out of warm water—have a good effect, and if the quantity of evacuated matter is great, a lead-and-opium tabloid should be occasionally given.

Distension of the abdomen by accumulation of gases is often a source of great trouble in typhoid fever. It is generally much relieved by the occasional application of a turpentine stupe. A turpentine enema may sometimes be administered with advantage. If hæmorrhage appears, a tabloid of tannin or ergot should be given every hour. The lead-and-opium tabloids are also of use in this condition, as the opium tends to secure rest to the bowel, and thereby give nature a chance of sealing up the mouths of the eroded blood-vessels by the process of coagulation.

The food of a typhoid patient must be regulated with the most scrupulous care. Peptonized milk, with a little of the Kepler malt extract, will be

among the best articles of nutriment. As already mentioned, if there is much diarrhœa, animal broths (such as beef-tea, chicken-broth, or mutton-broth) must be employed with great caution. There is no doubt that in many cases they are well borne, especially if well strained from solid particles, and peptonized before administration. Barley-water, toast-water, peptonized milk with equal parts of soda-water, etc., may be used as a beverage. The use of alcoholic stimulants is hardly indicated in typhoid, except when the pulse is obviously getting weak. Moderate doses, at intervals, may then tide the patient over a critical period.

Cold in the Head.

It is hardly necessary to observe that travellers, like other people, are subject to the very common troubles attendant on cold in the head, and all the more so as they are often necessarily more exposed to abrupt changes of temperature, to ward off the effects of which sufficient precautions cannot always be taken. The most frequent effect of exposure to slight chill is, of course, "a cold." When very slight, the effects of this condition may not reach far beyond the lining membrane of the nose, which forms, of course, the upper and most exposed section of the respiratory mucous membrane. If the inflammation which is so likely to commence in this (most exposed) region extends downwards to the upper section of the windpipe—region of the *pomum Adami*—there is *laryngitis;* if to the lower end of

the windpipe, which is placed behind the upper part of the breast-bone, and the commencing portions of its two branches, we have *bronchitis*. When the bronchitis extends to the smaller branches of the two divisions of the windpipe, which ramify in all directions throughout the lungs, it is known as "*capillary*" *bronchitis*.

For an ordinary cold in the head, it is desirable to keep to the house, so as to avoid all chances of a renewed chill, and use the following powder as a snuff: Hydrochlorate of morphia, two grains; white bismuth, two drachms; powdered gum acacia, six drachms. These constituents should be thoroughly mixed and minutely pulverized before use. Menthol snuff is also very useful. At night, a couple of tabloids of Dover's powder should be taken, the patient should be well wrapped between thick warm blankets, and warm drinks should be taken so as to encourage in every way copious perspiration. In the morning, the surface should be thoroughly well dried with a rough towel, previously warmed before the fire, and great care should be taken to avoid the slightest chill from exposure. If this treatment is properly carried out at the beginning of the symptoms, it will often be found to nip them in the bud.

Laryngitis.

Inflammation of the larynx is a much less frequent result of catching cold than is inflammation of the larger bronchial tubes. As the production of voice

is the special function of this section of the windpipe, the most distinctive symptom of the condition is modification of voice—hoarseness, sometimes even complete loss of voice. There is also pain on swallowing, and tenderness on pressure over the region of the *pomum Adami*. In bad cases, the breathing may be much affected by narrowing of this portion of the air-passage, due to swelling of the lining membrane.

In this disease the patient should be freely purged, and at the same time kept in a warm room, while the upper part of the neck is kept covered by a hot poultice, frequently renewed. It is sometimes desirable to make incisions in the swollen mucous membrane, which can be reached at the back of the tongue; but this procedure requires competent surgical skill. The patient should avoid the slightest exposure till the hoarseness has quite disappeared. A Dover's powder tabloid may be taken three times a day during the acute stage of the affection. The diet should consist of animal broths—beef-tea, chicken or mutton broth; with, occasionally, a beaten-up egg.

Bronchitis.

The characteristically prominent symptom of bronchitis is *cough*. At first the cough is dry, but after a day or two there is muco-purulent expectoration, often very copious in quantity. There is slight feverishness, and a little quickening of the pulse, in the milder class of cases.

There is a sensation of rawness and soreness, increased by every cough, behind the top of the breast-bone.

At the very beginning an attack of bronchitis may sometimes be cut short by a course of treatment similar to that recommended for "cold in the head." When the inflammation has taken a firm hold, it may still often be checked, in the case of otherwise strong patients, by taking a tincture-aconiti tabloid every quarter of an hour till a dozen have been taken, and one every hour afterwards. A hot poultice (frequently renewed) should be kept continuously applied to the front of the upper part of the chest and lower part of the neck.

The bowels should be opened, at the beginning of the attack, by a couple of compound cathartic tabloids. When the stage of expectoration has set in, teaspoonful doses of paregoric elixir may be given every three hours.

Pleurisy.

This disease is inflammation of the smooth membrane which covers the surface of the lung, and is reflected from the latter organ to the inner surface of the chest-wall, which it completely lines. By this arrangement, there are two smooth surfaces opposed to one another, so that the movements of respiration, during which the lung has to glide along the inside of the chest-wall, are carried on with the least possible amount of friction. Accordingly, when this membrane becomes inflamed, its

surface becomes roughened, so that the amount of respiratory friction is increased, and it also necessarily becomes tender and painful, so that every movement of respiration is extremely distressing. The most characteristic diagnostic symptom is the pain which, from its peculiar character, is popularly known as "stitch in the side." This pain is greatly increased by every movement of respiration, and, as a necessary consequence, the act of breathing is very painful and distressing. "Taking a deep breath" is intolerable.

As the disease progresses, fluid collects between the layers of inflamed membrane, which separates their surfaces, and thereby diminishes the friction and pain, so that the patient is able to lie on the affected side, which cannot be borne in the earlier stage.

There is a moderate amount of fever during the disease, and the pulse is quick, and rather small. The disease may be cut short in the early stage, or the fluid may be absorbed (or removed by operation) later on, or the affection may become chronic, and cause permanent ill health. Sometimes the fluid becomes purulent, which is always a very serious complication.

The first indication in the *treatment* of this disease is to relieve the pain, and this is best done by the use of morphine. A tabloid of morphine sulphate (one-eighth grain) may be given every hour for the first three hours, and every third hour afterwards, till the pain is permanently relieved. (This remedy may also be administered by hypodermic injection.)

The affected side of the chest should also be strapped with broad strips of adhesive plaster, each reaching from the spine behind to the middle of the breast-bone in front, and slightly overlapping one another. This procedure gives a certain amount of fixation to the ribs, and, by diminishing their movements, affords some rest to the inflamed membrane within. The bowels should at the same time be kept free. When fluid collects within the chest, and shows no sign of absorption after two or three weeks, it should be removed by tapping, but this operation must be performed by a surgeon.

Pneumonia.

The name *pneumonia* is given to acute inflammation of the substance of the lung itself. In the majority of cases it is confined to the lower segment (lobe) of the organ, and the disease is much oftener found to occur on the right side than on the left. The usual cause is a severe chill, and the disease is specially dangerous to life in hard drinkers, and in old people.

The *symptoms* of pneumonia are ushered in by a prolonged shivering fit, and the patient sickens so rapidly that he is obliged to take to bed at once. He lies usually on his back, with the head a little raised, and with a slight inclination to the affected side. The cheeks are deeply flushed, there is a short dry cough, the respiration is very rapid (often forty or more per minute), and there is generally some dull pain below the breast on the affected

side. As the disease progresses, expectoration appears, and the matter brought up is rather small in quantity, very viscid, containing hardly any froth, and is tinged with blood so as to give it a *rusty* colour. The fever tends to subside by a form of critical defervescence, about the end of the first week.

During the *treatment* of pneumonia, the affected side of the chest should be kept surrounded with a hot poultice, regularly renewed. If the fever runs up very high, it may be checked by the use of antipyrin, of which four tabloids may be given for a first dose, to be followed afterwards, at intervals of two or three hours, by smaller quantities, varying with the temperature and general condition of the patient. If the patient is full-blooded, the application of half a dozen leeches over the seat of pain will be followed by great relief. The bowels may be regulated by an occasional mild enema. As the skin is exceptionally dry in this disease, the administration of a Dover's powder tabloid three times a day, during the time of highest fever, is often productive of marked benefit. The patient must be nourished on light animal broths during the course of the disease. In cases where the heart is weak, or where the patient is old, or where a tendency to sinking is observed as the disease progresses, the use of stimulants is absolutely necessary. Free administration of stimulants is even more essential, as a part of the treatment of pneumonia, in cases where the patient has been a hard drinker.

Rheumatism.

Rheumatism is a disease of pronounced hereditary tendency, and where the predisposition exists, the changes of temperature to which travellers are so likely to be subjected—even in the tropics—are liable to be followed by the development of its symptoms.

Acute rheumatism—so-called "rheumatic fever"—is ushered in by a chill, followed by general febrile symptoms, pain and tenderness in the joints—usually commencing in the knees, and, in severe cases, soon extending to all the articulations—followed by swelling; and the appearance, when the disease is established, of a copious flow of acid perspiration, which has a characteristic sour-buttermilk-like smell. The pulse is quick and bounding, and the tongue is coated with a yellowish fur. In extreme cases the temperature runs up very high, and the patient sinks into a state of unconsciousness, and dies. This is, however, very exceptional; and the worst features of acute rheumatism, as a general rule, are —the danger of its affecting the heart, and of its recurring and becoming chronic.

At the commencement of an attack of acute rheumatism, the bowels should be freely evacuated by the use of a couple of compound cathartic tabloids; purgation should afterwards be avoided till the acute symptoms have subsided, as the pain accompanying the movements necessarily attending every action of the bowels is very great. The

patient should be placed comfortably in bed *between* blankets, and the perspiration should be gently wiped off from time to time, especially from the face, where it often gets into the eyes and causes great discomfort, when the patient is unable to raise a hand to remove it for himself. The great specific remedy for acute rheumatism is salicylate of soda, or salicine, which has a similar action. Of the former, four five-grain tabloids may be given every four hours, till the acute symptoms have subsided. In addition to the precaution of keeping the patient between warm blankets, carefully changed as they become damped by the perspiration, it is desirable to wrap up the affected joints in cotton wool, which should be kept in position by oiled silk or adhesive plaster. After the acute symptoms have subsided, the salicylate of soda may be given in doses of three tabloids every six hours for the next three days or so, and afterwards in gradually diminishing quantity.

Constipation.

Constipation is a form of digestive trouble which is often complained of on board ship, during the course of long voyages. In certain diseases of the liver, and in some forms of debility, it is also a usual and an unpleasant complication. One of the best remedies will be found in the occasional use of the compound cascara tabloid, of which one, or sometimes two, at a dose, may be taken as occasion requires. It is also essential to make a habit of

going to the rear every day regularly, at the same hour. A large enema of soap and water with one ounce of oil is very effective.

Colic.

Colic is another occasional concomitant of impaired digestion, or of habitual constipation, whether or not dependent on hepatic disorder. If the bowels have been confined for some time, which is a frequent history in connection with this complaint, a large turpentine enema should be promptly administered, and the whole abdomen should be covered with a hot turpentine stupe. A full dose of opium may be administered by the mouth—thirty minims of the tincture, or one tabloid, which represents about the same quantity of this remedy. This treatment will be found to give satisfactory results.

Congestion of the Liver.

The liver, as is well known, is a frequent seat of trouble, both acute and chronic, to travellers and residents in tropical climates. One of the simplest and most frequent affections of this organ is *congestion.* This condition is induced by chill, following exposure to great heat; also by abuse of stimulants, hot condiments, etc.

The symptoms are—a feeling of weight and fulness in the right side, beneath the lower ribs, a certain amount of tenderness on deep pressure, accompanied by loss of appetite, bad taste in the mouth, con-

stipation, and, sometimes, a reflected pain in the right shoulder.

It is best *treated* by early and complete evacuation of the bowels. This may be effected by the administration of a couple of compound cathartic tabloids; and the diet for some days after—till the patient feels well again—should be limited in quantity, and of a carefully selected non-irritating quality. Persons who are subject to attacks of acute congestion of the liver should be very cautious in the use of stimulants and hot condiments of any kind; because this affection, if neglected or repeated, is very likely indeed to pass on to the formation of abscess. Large doses of ipecacuanha are also very efficacious in relieving hepatic congestion. For this purpose three ipecacuanha tabloids (five grains each) may be given, and the region of the liver and pit of stomach should at the same time be kept covered with fomentations, which will tend to prevent the stomach from rejecting the ipecacuanha. In very acute cases of congestion of the liver, in which the formation of abscess is dreaded, blood is sometimes withdrawn directly from the organ by means of a trocar. This can, of course, only be done by a skilled surgeon.

Abscess of the Liver.

There are two kinds of abscess of the liver which require to be mentioned in this connection: one is the so-called *tropical* abscess, which follows aggravated cases of acute congestion; the other is the

dysenteric abscess, which occurs as a complication of acute dysentery. Of the latter, little further need be said, as nothing can be done for it except by a skilled medical man. It is usually multiple—two or three deeply seated collections of pus—and is not a favourable case for any operative procedure, so that the treatment must be palliative.

The *tropical* abscess, which is one of the great terrors to residents in hot climates, who have been afflicted by nature with a weak liver, is a single collection of pus, and is nearly always situated in the right lobe of the organ. It is a sequel of acute congestion, but, in a large proportion of cases, progresses so insidiously that its existence may not be suspected till it has excavated the greater part of the right lobe of the liver. When dull pain is experienced on pressure over the lower ribs on the right side, and there is a tendency to tension of the muscles of the abdomen on this side, especially the vertical one near the middle line of the body (*rectus abdominis*); and if the patient is annoyed at the same time by a dull gnawing pain in the region of the right shoulder, the existence of abscess of the liver may be suspected. In some cases its presence makes itself obvious by more definite symptoms: hectic fever, characterized by evening rises and morning remissions, nocturnal perspirations, frequent vomiting, and general disorder of the digestive powers, with progressive emaciation. When the abscess approaches the surface it may be felt by palpation below the edges of the false ribs. Only

surgical treatment can be of benefit in such cases, and this requires great skill, with assiduous care and attention.

Surgical Diseases and Accidents.

It is needless to say that travellers, when far from home, and especially when located in the depths of regions still uncivilized, are often liable to surgical injuries and accidents; and, when skilled assistance cannot be procured, as is frequently the case, it is a matter of the greatest importance that they should, under such circumstances, possess some rudimentary information about the nature and treatment of the afflictions which they may be any day called to treat in the persons of themselves or their friends. As the simplest of these, I will begin with the consideration of

Hæmorrhage or Bleeding.

Bleeding from the large vessels is of two kinds, according to the nature of the injured vessel—*arterial* or *venous*. The former is known by the bright red colour of the escaping blood, and the fact that it spouts forth in jets; the latter by the dark purplish colour of the blood, and its quietly welling up in the wound. The arterial hæmorrhage is more formidable, as the blood escapes with greater velocity; and, in the case of a large vessel, must be very rapidly fatal, if not controlled. Venous bleeding is less dangerous; and, as a rule, more manageable.

If the wound is a small one, bleeding can often be controlled by direct pressure with the finger, after which the wound should be secured by a series of superimposed pads, these being firmly retained in position by a strong bandage. The pad which is directly applied to the wound should be small, rolled very hard, and so placed as to press immediately on the bleeding point; the others should be made larger by degrees, and the most superficial of all of considerable size, so that it will be more easily grasped by the turns of the bandage. This treatment is nearly always effective in case of venous bleeding. The bandage, of course, requires careful watching afterwards. In the case of an artery, it is well, before applying any pads, to seize the mouth of the vessel from which the blood is seen spouting with a forceps, and tie a silk ligature firmly round a little above the seat of injury (*i.e.* on the side next the heart). If forceps and ligature are not at hand, and the bleeding cannot be dealt with in this way, it may nevertheless be controlled by pressure, if kept up for a sufficient time, so as to allow the blood to coagulate firmly at the seat of injury. Several persons should, if possible, take turns in keeping up the pressure, as it tires the fingers and hand very soon. The pressure on a bleeding artery must be made on the side next the heart, on the distal side in case of a vein. If the main artery of a limb has been divided, the pressure may be advantageously applied, for some time at least, by making a few turns of a roller bandage around the limb, then passing a stick under the bandage, and twisting it till

all the soft parts of the limb are firmly compressed against the bone. (This is the oldest method of applying the *tourniquet.*) A piece of elastic tubing, drawn tightly around the limb above the seat of division of its artery, and firmly tied, also makes a very effective compressor. The main artery of the lower limb can be very easily controlled by pressure in the middle of the fold of the groin, where its pulsation can be distinctly felt, on account of its superficial position. The main artery of the upper limb can be controlled, where it passes down behind the internal curve of the collar-bone, by pressure against the first rib. As it passes from below the armpit, its pulsation can be easily felt on the inside of the arm, till it approaches the elbow, when it recedes from the surface. When an artery is wounded below the elbow, the limb should be firmly bandaged, from the fingers up to the elbow-joint, after padding the wound in the usual way. A firm pad should then be placed in the bend of the elbow-joint, and the fore-arm strongly flexed upon it, and bound up in that position. When an artery in the palm of the hand has been wounded, the wound should be well padded, and the fingers comfortably bandaged; a cotton ball or some such round mass should then be placed in the hand, the fingers firmly flexed over it, the whole hand bound up in that position, the bandage then carried up to the elbow-joint, and the latter padded, flexed, and secured as in cases of wounds of the fore-arm itself. All this care is necessary in cases of wound of an artery in the palm, as it is generally difficult to control on

account of the free communication between the various arteries in that position. Where the bleeding is from the inside of the arm above the elbow, direct pressure, with subsequent application of pads and a bandage from the fingers upwards, will be found effective; if in the armpit, the artery must be compressed behind the collar-bone, downwards against the first rib.

The treatment for bleeding from the arteries of the lower extremity is very similar to that recommended in the case of the upper. When below the knee, this joint should be well padded and firmly flexed, in addition to the local padding at the seat of the injury; and the bandages always carefully applied from the toes upwards. The great artery of the thigh is much deeper in its position than the corresponding vessel of the arm, but bleeding from it can always be controlled by pressure in the middle of the groin, as already noted. The artery is placed very superficially at that point, and its pulsation is, accordingly, a ready guide.

In the treatment of all cases of hæmorrhage, the patient should be kept lying down, as this quietens the circulation. When the bleeding is from a limb, the latter should be kept supported in an elevated position, as the force of gravity will in this way oppose the escape of blood.

When a person faints from loss of blood, he should always be kept lying till he has recovered consciousness, and even till he has regained a certain amount of strength; as there would otherwise be great danger of sudden failure of the heart's

action. Alcoholic stimulants should be avoided while bleeding is going on, unless the patient has sunk into a state of extreme collapse. In such condition, the hypodermic injection of a teaspoonful of ether is often followed by excellent results. The patient should be kept lying flat, with the head somewhat *lower* than the body, and the latter wrapped up in warm clothing.

Injuries of the Head.

A severe blow or fall on the head may so shake the brain as to cause a partial or complete suspension of its functions without any very obvious lesion of its substance. Such cases are spoken of as

Concussion of the Brain.

The symptoms of concussion may be of various degrees of severity. In the mildest form, the patient is merely stunned for a few moments, feels shaken for a time, but suffers from no subsequent severe symptoms. In other cases, the patient remains for a time—sometimes a considerable number of hours—in a state of collapse and stupor. In typical cases, the unconsciousness is not complete. He will say "yes" or "no" when loudly questioned, and will cry out loudly when hurt; but will give no reasoning replies, and always relapses immediately into a state of stupor. He looks shrivelled up, and there is contraction of all the superficial vessels, so that the pulse at the

wrist is small and weak—it may also be intermittent. The breathing is weak, and slow; in bad cases it is almost imperceptible. The surface is cold and clammy. After some time, reaction sets in, and the patient partially recovers, but the mental faculties may be very imperfect for a considerable time; and, in bad cases, the memory may be permanently affected. There is also great danger of inflammation of the brain following upon the stage of reaction, if active measures are not adopted.

The treatment of such cases should be very prompt in order to give good results. The patient should be immediately put into bed, between warm blankets; and hot-water bottles, over which flannel stockings have been drawn, applied to the soles of the feet, and placed here and there about the patient's body and limbs. Hot linseed poultices, with mustard sprinkled over the surface, should also be applied to the calves of the legs, insides of the thighs, and pit of the stomach. A little hot tea or coffee may be given to the patient, if he can be got to swallow, but much drink should not be pressed upon him, and alcoholic stimulants should be avoided, as they tend to bring on too violent reaction, and increase the danger of subsequent inflammation of the brain. In cases when collapse appears to be extreme, however, a little whisky or brandy, well diluted, may sometimes be the means of saving the patient's life. A large turpentine enema—nearly a glassful of turpentine, well rubbed up with about the same quantity of olive oil, and a couple of beaten-up eggs, and with the addition of

nearly a pint of water—should be administered as early as possible. When reaction sets in, the patient should receive a full dose of calomel (five tabloids), and the bowels should be kept very free for some days, till all appearances of congestion have disappeared from the face and head. If the temperature runs up after the reaction has set in, ice must be kept to the head, the patient purged freely, and kept perfectly quiet and carefully watched, in a darkened room. During the treatment and the convalescence alcoholic stimulants should be carefully avoided. Liquid nourishment only must be used, till the head-symptoms have well subsided.

Compression of the Brain.

When the brain is pressed upon by any substance, a series of symptoms always develop after the pressure has reached a certain degree. The patient lies in a state of complete unconsciousness and absolute insensibility to pain. The breathing is stertorous, and the pupils of the eyes are generally unequal in size. The pulse is slow, full, and labouring, and the skin is warm and flushed. Accordingly, there is a marked contrast between the symptoms and those due to concussion. The surgical causes of compression of the brain (in addition to the presence of foreign bodies which needs no further discussion here, as they require the most skilled immediate attention) are—fracture of the skull with depression of the bone, bleeding from a ruptured blood-vessel, and a collection of

pus following inflammation. They may be generally distinguished by the several facts that the symptoms appear: when due to depressed bone, immediately on the receipt of the injury; when due to extravasated blood, after an interval of consciousness—varying in length according to the size of the injured vessel; when due to the presence of pus, after an interval of about ten days, and following symptoms of high inflammatory fever. It is not necessary to discuss the treatment further than to emphasize the necessity for absolute rest in the horizontal position, and the avoidance of alcoholic stimulants, as these cases all require skilled surgical attention.

Drowning.

In attempting to resuscitate the partially drowned, the essential objects are—to remove the water from the air-passages, and to restore the process of respiration. If the heart's action has completely ceased, all efforts must fail to restore the patient; but its sounds are so weakened in advanced cases that it is very difficult to say whether or not the movements of this organ have come to an absolute standstill; and the patient should, of course, receive the benefit of all existing doubts.

The patient's clothing should be at once removed, down to the waist; and the body should be placed in an inclined position with the head lowest, so as to allow the water to escape from the mouth and nose. These passages should be at once wiped as free as possible from water and mucus. One of

the arms should then be raised, and the body rolled over, with the face downwards, and resting on the raised arm. The patient's other arm should then be firmly grasped above the elbow, and the body turned on its side with the help of this hold, while the arm is at the same time slowly raised as high above the head as possible. He should then be slowly rolled back on to his face by pulling on the same arm, which is at the same time gradually brought down, and pressed with great force against the side. This movement alternately expands and contracts the cavity of the chest, and should be steadily repeated about sixteen to twenty times per minute. An assistant, if at hand, should at the same time keep the mouth widely open, and the tongue drawn well forwards.

Another method of performing this process of artificial respiration is by standing behind the patient's head while he lies on his back, grasping both arms just above the elbows, raising them slowly and steadily as high as possible above the head, and then bringing them gradually down, and pressing them firmly against the sides. This series of movements, like the other, should be repeated about sixteen to twenty times per minute. I would emphasize the importance of compressing the chest firmly when the arms are brought down: they should be squeezed as tightly as possible to the sides, for about two seconds each time. The chest and abdomen could be compressed from the front at the same time, if an assistant were available. Every pressure so applied helps to expel the water from the air-

passages, which is, of course, absolutely essential to the establishment of normal respiration.

When the function of breathing has been established, and the patient has gone to sleep—as he will do soon after the exhaustion which he has undergone—he should be watched very closely, as there is always great danger that the breathing may suddenly cease without any preliminary warning; and if the artificial respiration is not immediately proceeded with again, recovery is hopeless. This is a fact which cannot be too generally known, as the want of knowing it has led to the loss of lives of persons who had been apparently quite restored.

Poisoning.

There are, broadly speaking, two great classes of poisons: those which act locally, on the mucous membrane of the alimentary canal; and those which act on the nervous system, after absorption into the system. Of the first division there are, again, two varieties: the *corrosive*, which act immediately by causing chemical changes in the tissues with which they come into contact; and the *irritant*, which act as their name implies, and cause violent inflammation by the irritation of their presence. Of the nerve-poisons also a division has been made, according as they act on the brain or spinal cord, or both. Some of them have peculiar actions on the peripheral nerves or their terminal organs. They are all, however, usually spoken of as *narcotic*.

It is not desirable, in a volume like the present,

especially meant as it is for the use of non-professional readers, to enter into a detailed description of the symptoms and treatment of the various poisons—especially in the case of the narcotics. These produce, in each case, special characteristic symptoms, and always require skilled treatment, if at all procurable. The other poisons, however, require but a simpler form of treatment, and the symptoms are more easily recognizable to the non-professional eye.

The *corrosive* poisons include the strong acids and the caustic alkalies. All these cause *immediate, intense* pain when taken into the mouth, which is continued into the throat, gullet, and stomach. The mucous membrane is blackened and corroded by the contact, violent vomiting sets in immediately, and the patient rapidly sinks into a state of extreme collapse. The *bowels* are *confined.* If the nature of the poison is not already known, the vomited matters should be tested.

In cases of poisoning by the acids, alkalies should be given as quickly as possible. Magnesia, chalk, or even the whitewash scraped from the ceiling, are all convenient and useful alkalies in the absence of prepared drugs. Swallowing soap-suds is another convenient mode of treatment, which has the additional advantage of acting as an emetic.

In cases of alkaline poisoning, weak acids must be given as rapidly as possible, and those most easily procured, as a rule, are vinegar, lemon-juice, and tartaric acid. In all cases of corrosive poisoning, vomiting should be encouraged in every way.

Cases of poisoning by irritants are distinguished from those of corrosive poisoning, by the fact that, as they do not act immediately on the tissues, there is always an *interval*—of a quarter of an hour or so—before the symptoms appear. These also develop rather gradually; and the mouth, throat, and gullet are not appreciably affected. Vomiting then appears, with an increasing pain in the stomach; this symptom, as in the case of corrosive poisoning, should always be encouraged. *Diarrhœa* also supervenes, which forms another point of contrast with the symptoms of corrosive poisoning.

Of the irritant poisons, the most important are: *oxalic acid*—which has been so often mistaken for Epsom salts, on account of the similarity of the crystals—*corrosive sublimate*, and *arsenic*. Of these, oxalic acid may be treated by the use of the alkalies mentioned when discussing the treatment of poisoning by the strong acids; vomiting also must be brought on as rapidly as possible. Beaten-up eggs form an efficient antidote in cases of poisoning by corrosive sublimate. Arsenical poisoning is best treated by giving freshly precipitated ferric hydrate, obtained by saturating a solution of perchloride of iron with ammonia-water.

Wounds.

A wound, or solution of continuity of the surface of the body produced by violence, may be one of various kinds; the different classes presenting special features, and presenting peculiar dangers.

The *incised*, or clean-cut wound, is especially liable to produce copious hæmorrhage, which must be dealt with on the principles laid down in the directions we have given under that heading. Care must also be taken, before the wound is finally closed, to remove any clots of blood, or foreign bodies, which may be present. The edges may then be washed by a weak carbolic lotion, or one of corrosive sublimate, and adjusted in as complete contact as possible by adhesive plaster, or by stitches.

The *punctured* wound may be dangerous from hæmorrhage if it has reached one of the large vessels, or it may be dangerous when it engages one of the cavities of the body, by involving some of the viscera. Its more especial complications are, however, the liability to the subsequent development of tetanus or erysipelas; either of which may prove very serious, the former being often terribly fatal in tropical climates. These complications are probably due to the fact that any foreign matter introduced by a puncture is especially liable to be retained, and so set up mischief, both locally and by absorption into the circulation. Accordingly, if a surgeon is present, the most rational treatment which he can adopt in the case of most punctured wounds, is to lay them open by free incision, wash thoroughly free from any dirt or other matter which may be present, and then treat as above described under the heading of incised wounds. In the case of wounds by poisoned arrows, this procedure is not quite advisable at first, for by making a larger

wound the poison may be absorbed all the more rapidly, even before it has time to be completely removed by washing. As some, at least, of the poisons used by savages for their arrow-points are not very rapidly absorbed by the unbroken mucous membrane, sucking the wound may be tried, if the attendant has sufficient pluck to do it. The abstracted matter may be rapidly ejected with the saliva from the operator's mouth, and he may then wash out the latter cavity with a weak carbolic lotion.

Lacerated wounds are not usually at all dangerous from the amount of bleeding which follows. They cause trouble from the fact that there is usually a good deal of tissue lost, and the subsequent healing must be slow, and may, if not very carefully attended to from the beginning, be accompanied by a great deal of suppuration, which will, of course, be a severe tax on the patient's strength.

Burns.

When the skin is extensively burnt or scalded, the clothing covering the affected part should always be removed with great gentleness. In most cases, it had better be removed by *cutting* than by the usual process of undressing. The best direct application to the burnt surface then is: equal parts of olive-oil and lime-water, spread on the downy side of lint. If this dressing be not at hand, flour or powdered starch should be dredged freely over the part, so as to form a complete covering, and

thoroughly exclude the air. This should then be carefully covered and protected from rubbing.

If the burn is extensive, the patient will be necessarily in a state of collapse. In this condition he should be rapidly placed in bed, between warm blankets, with hot-water bottles, drawn into woollen stockings, placed here and there around him. A hot linseed poultice, with mustard dusted over the surface, should be applied to the pit of the stomach, and a similar application to the calves of the legs and insides of the thigh is also useful (if these parts are not burnt). Hot milk (or tea or coffee) may also be given to drink; or some *very dilute* brandy and water. It must be remembered that, in such cases, alcoholic stimulants must be employed with caution, as they tend to set up too much inflammatory reaction. Opium, in doses of one grain (one tabloid) per hour, for the first three or four hours, may also be given with great advantage.

Sprains.

Sprains are among the unpleasant ailments to which travellers, very naturally, are extremely liable. It is well known that they are most likely to occur in connection with the ankle-joint. The name *sprain* is given to the symptoms produced by the momentary violent stretching of the ligaments of a joint, with rupture of some of their fibres and blood-vessels. Swelling is produced by the escape of blood into the tissues, and there is inflammatory

reaction afterwards, varying in degree with the amount of the original injury.

The treatment must be commenced by placing the limb in a position of absolute rest in an elevated position. For this purpose it should be supported on pillows, and steadied by sand-bags on either side. At the moment of the occurrence of a sprain, the application of cold lotions or fomentations will tend to check future swelling and inflammation. When, however, the latter has once set in, warm applications are much more soothing and beneficial. If leeches can be had, their application will be also useful. A good deal of stiffness usually remains for some time, even after the inflammation has subsided. This is much benefited by rubbing and kneading (massage) in the direction of the muscles and sinews, and always *towards* the body, from the distal part of the limb.

Bruises.

When a part has been severely bruised, an excellent treatment, if it can be applied *at once*, is to foment the injured surface continuously, with cloths wrung out of water as hot as can be borne without actually scalding the skin. If not seen for a couple of hours, the application of a cold lotion is generally more beneficial. After an interval of a few days, careful kneading of the part, and rubbing in of an emollient ointment, such as lanoline ointment, will have a good effect.

Blisters on the Feet.

A naturally thin skin, with a wrinkled stocking, or an ill-fitting boot, is the cause in almost every case. The prevention by attending to the dressing of the feet in the morning is, accordingly, very obvious. The skin is greatly improved for walking by soaking the feet in warm salt and water, to which a little alum may also be added with advantage. The stockings, if rough on the inside, may with great benefit be rubbed over with soap, very slightly moistened. In selecting boots for walking it is well always to take those with elevated toe-caps and heels of but moderate height. They should, of course, be wide and easy, but not too loose. When a blister has once formed, it may be pricked with a needle at the most depending part, the cuticle removed with the scissors, and the surface with some of the surrounding skin covered with adhesive plaster. If very large, however, further walking should be avoided for some days, and in that case it is better to preserve the cuticle, and apply an emollient dressing. An ointment made by thoroughly blending fifteen grains of boracic acid with an ounce of lanoline will be found an excellent application.

Chilblains.

Chilblains are especially likely to form on the toes in cold weather if the person wears tight boots, as the circulation is impeded by the pressure.

Their formation is also promoted by bringing the chilled parts near the fire before the circulation has been fully restored. Rubbing the chilled parts briskly with snow (if this is procurable) is a good method of restoring a healthy circulation. Friction with camphorated spirit is also a good treatment. Painting with tincture of iodine afterwards is one of the best curatives, but it should be done very early. Open chilblains must be poulticed till the inflammation has subsided, and then dressed with a boracic acid ointment—ten or fifteen grains to the ounce of lanoline. This should be applied on lint.

When persons are naturally subject to chilblains periodical soaking of the hands and feet in a strong solution of salt and water, or alum and water, is very useful in giving a better tone to the cutaneous circulation.

Frost-bite.

The condition known as frost-bite represents an aggravated state of the changes in the tissues and circulation of a chilled part of the body, which in the milder form leads to the development of chilblains. The great danger of frost-bite is, that if the case is an extreme one, or not skilfully attended to in time, mortification sets in, and completely destroys the affected part. It is specially likely to run this course if the part is brought near the fire before the circulation has been restored.

The best treatment is to have all the chilled

parts well rubbed with snow or pounded ice, till the circulation and sensation have been pretty well restored, and then to have them wrapped in lint wetted with cold water. This may afterwards be replaced with dry lint, the downy side of which should be applied to the skin, and this covering should again be followed by a deep layer of cotton wool. By following out these stages in the treatment and dressing of a frost-bitten limb, a part apparently quite dead may be restored to health again. If mortification has set in, the part must be kept carefully dressed by antiseptic applications till the dead tissue separates. The application of carbolic oil, or powdering with iodoform from a dredger, will be found most reliable. If a considerable portion of a limb is thus affected, amputation becomes absolutely necessary. The patient in the mean time will require absolute rest, and the use of alcoholic stimulants—the amount of the latter varying, of course, with the severity of the case, and the general condition of the patient's system. When mortification has actually set in, the part should be well wrapped up in iodoform wool, or some such antiseptic covering, till the dead tissue has separated; or, in those cases where a large portion of a limb has been engaged, till the necessary amputation has been performed.

Boils and Carbuncles.

A carbuncle (anthrax) may be regarded as an aggravated form of boil, occurring in persons of

debilitated constitution. At the very beginning, either affection is represented by a small reddish and painful elevation of the skin. In this stage, the growth appears to be sometimes arrested by touching with pure carbolic acid. When the growth has well developed, it should be kept assiduously poulticed, and the patient should take rest, and light nutritious diet, till the central mass of dead tissue which always forms has separated spontaneously, and escaped through the opening which forms on the top. In cases of ordinary boils, free purging with salines has a most beneficial effect. In the case of carbuncles, on the other hand, the patient's system always requires supporting treatment. Beef-tea and iron wine may then be used with marked advantage, or the Kepler Essence of Malt, and a five-grain tabloid of quinine bisulphate should be administered two or three times a day.

In cases of large carbuncles, where there is great local tension and much feverish heat, it may be desirable to incise freely along the whole length of their surface. This, however, should only be done by a surgeon. Free cauterization of the central portion of the skin with pure carbolic acid also gives relief, and allows the earlier escape of the central core of gangrenous tissue, thus permitting the process of reparation to commence.

Ulcers.

Ulcers are oftenest found on the lower limbs, but among explorers in remote parts of the African

continent, they are liable to form anywhere, when the system has become debilitated by long exposure and bad food. We had a terrible experience of the ravages of ulcers during the progress of the Emin Pasha Relief Expedition. Under the unfavourable circumstances mentioned, the slightest scratch or accidental abrasion of the skin is likely to be followed by a rapidly spreading, and often most intractable, ulcer. The irritation caused by parasites—the ticks, etc., which are so numerous in tropical Africa—often proves the starting-point of one of these troublesome sores. They are not usually very painful, but the copious discharge causes such a drain on the already debilitated system as to give rise to great weakness, in addition to the local annoyance.

The very best local *treatment* which I have found for these lesions is the application of pure carbolic acid to the surface, which can afterwards be wrapped up in absorbent cotton. When the system could be well nourished at the same time, and the patient was allowed sufficient rest, this always effected a cure. Dusting with iodoform powder, and afterwards wrapping up in iodoform wool, which is kept in position by a bandage, will also prove an excellent application.

Snake-bites.

Travellers in most parts of the tropics are, as is, of course, well known, liable to suffer from the bites of those dangerous reptiles, except very special

precautions are taken. The bite of a venomous snake is generally known by the two circular punctures which are characteristic of the poisoned fangs; the other teeth are but very small, and leave but barely noticeable scratches, if they leave any mark at all. The bites of the poisonous sea-snakes are exceptions to this rule; the fangs as well as the other teeth are minute in size, and their punctures hardly distinguishable from those produced by the other teeth.

The *treatment* of snake-bite is carried out on very simple principles, and will be probably effective if it can be applied immediately. In the case of a limb, it should instantly be firmly tied with some kind of strong bandage above the position of the punctures. The compression of the limb should be carried so far as to interrupt, as completely as possible, the circulation in the superficial tissues. If a surgeon is then present, the bitten part should be completely excised, and the wound washed and syringed for a considerable time with the greatest care and thoroughness. If there is not an ordinary bandage to be had, a strong silk handkerchief can be tied around the limb; a stick should be inserted between it and the skin, and by twisting the stick strongly, the limb may be compressed as firmly as is desirable. No effort should be made to stop the bleeding after excision of the bitten part for a considerable time. Strong ammonia-water should then be employed to wash out the wound, after which it may be cauterized to arrest any bleeding that continues. The hot iron or a strong acid may

be used for this purpose. If a surgeon is not present, an assistant should bind the limb as tightly as he can—as already recommended, and encourage the wound to bleed freely by incising it with a sharp knife. There is little danger, too, in his sucking the wound—if he can bring himself to do it—when the mucous membrane of the lips and mouth is perfectly unbroken. The matter extracted by suction can, of course, be immediately ejected, and the mouth carefully rinsed. If the seat of the bite is within the patient's own reach, he can, of course, do it himself. The patient should then have his strength supported by free use of alcoholic stimulants. The hypodermic injection of strychnine has recently been most favourably reported on in the treatment of snake-bites. For this purpose two tabloids may be dissolved in water and injected every third hour.

Insects and Other External Parasites.

Mosquitoes form, notably, one of the great plagues of most tropical regions. They are, of course, most troublesome at night, and the face and other parts exposed to the air should be carefully protrected from their attacks by the use of mosquito-netting. Smearing the exposed parts of the body with carbolic oil is also useful in warding off their attacks. The bites of these pests are to be avoided not only from the amount of local irritation which they cause at the time, but from the fact that they are sometimes the agents for introducing, through

the punctures which they make for extraction of blood, a minute—but very mischievous—parasite into the body (*Bitharzia hæmatobia*), which afterwards gives rise to very serious symptoms.

Ticks, which bury themselves in the skin, and produce, by their presence, intense itching and irritation, are among the great pests of some tropical regions. They abound, in enormous numbers, in Equatorial Africa; and formed one of the great plagues of the Emin Pasha Relief Expedition. The free use of carbolic soap in washing, and subsequent inunction with carbolic oil, will go a long way to protect the exposed surfaces from their attacks. When noticed in the skin they should be at once dislodged. I have found the fine point of a narrow-bladed knife the best instrument for this purpose. The part should then be well rubbed with carbolic oil.

The *jigger* is another of the parasitic pests of tropical climates, and is especially likely to be found burrowing under the toe-nails after walking in long grass. They should be dislodged with great care, by picking them out with the point of a needle or a small-bladed knife, or a very finely pointed forceps. Carbolic oil should then be carefully rubbed in.

Leeches are sometimes found to prove very troublesome when wading through marshy grounds in the tropics, as the traveller is often obliged to do. They sometimes stick to the legs in numbers, and extract large quantities of blood. They may even creep for considerable distances under the clothes,

and afterwards attack the skin when the tired traveller is resting or sleeping. In walking through long grass, where they are frequently found in great numbers, they may attach themselves to the face and creep up the nostrils; where their presence, by biting and irritating this delicate mucous membrane, may cause very serious loss of blood. Accordingly, after travelling in long grass, or wading in water, or passing along marshy ground, the surface of the body, and also the clothes, should be carefully searched for these very unpleasant companions, which would otherwise be sure to attack the traveller when asleep. When adherent, they are best dislodged by the use of salt-and-water. If the bleeding from any of the bites prove troublesome, it may be checked by the application of a pointed stick of nitrate of silver.

The more familiar parasites, *lice* and *fleas*, are prone to multiply in great numbers in hot climates. Frequent change of linen, scrupulously careful washing, and the use of Keating's insect-powder, will be found protective against their presence.

Dislocations.

Dislocations—*i.e.* violent separation of the bones of a joint produced by injury—can in most cases be dealt with only by a skilled surgeon. Its occurrence is known by the pain, and the fact that the joint is deformed and rigid, so that the affected limb cannot be moved voluntarily, nor even to any considerable extent by artificial aid, without the infliction of

extreme pain. The fact that the joint cannot be moved by the hand of another distinguishes this form of injury from fracture near the joint, for which it might otherwise be mistaken.

The dislocation which will probably be most frequently met with is that of the shoulder-joint. When this injury has occurred, the patient cannot move his shoulder, and although he can bend his elbow, he cannot raise his hand to his head. The shoulder is flattened on the outside, the elbow projects from the side, and the upper end of the displaced arm-bone can usually be felt by examining the armpit.

This dislocation can nearly always be reduced by an intelligent assistant, who happens to possess a fair proportion of muscular power, by having the patient's body firmly held while the hand and wrist are firmly grasped, and the arm forcibly raised to the horizontal position and drawn horizontally outwards —*i.e.* in a direction at right angles with the trunk. The reduction may also be effected, especially in the case of patients who are not themselves very muscular, by placing the unbooted heel of the same side as the injury in the armpit, while the patient lies in the horizontal position, and drawing the arm firmly downwards while holding the hand and wrist.

Fractures.

A *fracture* or *breaking* of a bone can, like dislocation, in most cases be treated efficiently only by a skilled surgeon. Its occurrence is known by

the facts that an injury has occurred, that there is deformity with pain at the affected part, that the patient cannot perform the usual movements voluntarily, while the mobility is increased in the hands of another. The passive movement so produced when somebody else manipulates the affected bone is accompanied by a grating sound, and a grating feeling to the hand: this is technically known as *crepitus*.

The commonest fractures are: of the collar-bone; the outer bone of the fore-arm—a little above the wrist; the outer bone of the leg—a little above the ankle; and the ribs.

The great objects to be attained in the treatment of fractures of all kinds are: to restore the broken surfaces to a position of mutual contact, from which they are almost invariably displaced, either by the original violence or by muscular action; and the maintenance of them in that position by suitable appliances, while absolute rest is secured in order to allow nature to conduct the repair of the injury.

The bones of the limbs are always retained in position after the occurrence of fracture by splints and bandages. Where proper appliances are not at hand, splints may be extemporized by narrow pieces of board of the length of the affected limb, or by tying together, singly, at regular intervals, a number of straight rods, or pieces of iron wire. Even walking-sticks or umbrellas may, upon occasion, be used for this purpose. The boards, sticks, etc., when secured together at the ends, should be adjusted around the limb, having

previously reduced the existing deformity as far as possible, by gentle but firm traction. They should then be carefully bandaged in their position —remembering that the object of their presence is to preserve the contact of the broken surfaces of bone in their natural position, and to secure them rest.

In fracture of the *collar-bone*, which, as I have already said, is the commonest of all, a stout pad should be placed in the armpit, the elbow drawn forwards, and supported in position by a broad handkerchief, whose ends are tied around the opposite side of the neck. If a bandage is then coiled around each armpit in turn, and crossed in form of a figure-of-8 behind the back, it will give a fair amount of support to the broken bone.

When a *rib* has been broken, a flannel roller-bandage must be made to support it comfortably, by giving six or eight turns around the chest, tightening it as much as the patient can comfortably bear, inserting some stitches here and there to prevent the folds from slipping, and securing the upper turn of the bandage by shoulder-straps on each side—which can be made of tape and firmly stitched.

Fractures of the arm (*i.e.* above the elbow) should be treated by carefully wrapping the limb in cotton wool, then adjusting three or four long narrow splints around the limb—taking care that the inner ones should not chafe the folds of the armpit, and that the one in front should not reach quite to the bend of the elbow. The limb should then be bandaged

from the fingers to the shoulder, and the wrist supported in a sling.

Fractures of the fore-arm require the application of two splints, one in front and one at the back; both, of course, comfortably padded. The limb should then be bandaged from the fingers to the elbow; and the whole length of the fore-arm supported in a sling, with the hand raised somewhat above the level of the elbow, and the thumb looking upwards.

Fractures of the thigh are very troublesome, as they always cause permanent shortening if not treated with the greatest care and skill. It is unnecessary to give any details, as they always require the assistance of a surgeon. When the accident has occurred at a distance from the patient's home or resting-place, the limb, including the leg, should be firmly bound to the sound one, so as to prevent movement as far as possible, and the patient then conveyed on a stretcher.

In fractures of the knee-cap, the most important essential is to keep the knee fully extended, and the whole lower limb a little raised, so that the heel rests on a higher surface than the buttocks.

In fractures of the leg, wooden splints may be applied on each side, or the whole leg enclosed in a box-splint, carefully padded. The foot should always be kept in the erect position, with the great toe in a line with the inner edge of the knee-cap.

When a fracture has become *compound*, i.e. when there is an opening through the skin and other soft

tissues leading down to the seat of fracture, extra care is necessary, as the injury is a very serious one. All dirt should be carefully removed by syringing with a weak carbolic lotion, and the opening should then be well covered with lint steeped in carbolic oil, or with iodoform wool, so as to exclude the air thoroughly during the healing process. In the application of the splints, too, extra precautions are required, as it will be necessary to have the seat of the wound uncovered by splint or bandage, so as to permit the requisite examinations from time to time, and the changes of dressing.

Piles (Hæmorrhoids).

This troublesome affection is one to which persons with naturally sluggish livers are greatly prone, even in temperate climates, and they are likely to be greatly aggravated by residence or travelling in the tropics. Piles, at the time of their earliest formation, are simply dilated (varicose) veins in the vicinity of the lower orifice of the bowel. From the fact that all the blood from this region has to return to the heart through the liver, every affection of the latter organ, which tends to retard or obstruct the circulation within it, is likely to lead to the formation of piles. Piles may be situated within the orifice of the bowel, or immediately outside, or they may be so placed as to be partly inside and partly outside. Those situated in the latter position are likely to be the most distressing of all, as they are compressed by the action of the sphincter

muscle, which closes the lower orifice of the intestine. They are extremely likely to become inflamed, when they cause very great discomfort. Even without this complication, the formation of piles produces great distress, as they cause a continuous sensation of heat and weight about the part, which entirely unfits the patient for any continuous exertion.

When there exists any constitutional predisposition to the formation of piles, they are brought on by neglect of the bowels, sedentary habits, over-indulgence in soft cushions, the application of heat to the fundament, etc., as well as by all the conditions which derange the circulation within the liver.

The best preventive is regular living, extreme attention to the bowels, and a fair amount of open-air exercise. When they have existed for some time, they are likely to become ulcerated, and so cause increased trouble. In the case of internal piles, profuse bleeding is likely to occur from time to time with the movements of the bowels, so as to keep the patient always weak and anæmic.

When piles have existed for some time, they require to be treated by surgical operation. In the very early stages the symptoms may be palliated by the regular use of very mild laxatives, careful washing with cold water after every movement of the bowels, and the application, after drying, of gall and opium ointment, or an astringent suppository.

Ophthalmia.

Ophthalmia, or inflammation of the membrane which covers the front of the white of the eye and the inside of the eyelids, is often very troublesome in tropical climates. In some parts of Africa it is so common a plague, that it has been known to Europeans since the time of Napoleon's Egyptian campaign as "Egyptian" ophthalmia. The presence in the atmosphere of fine particles of sand, not only in and near the great deserts of this continent, but also at great distances therefrom, to which they are carried by every atmospheric current, is certainly one of the most fruitful agencies in the production of the disease. There is also no doubt that a great deal of the ophthalmia which is seen in Egypt is merely an infectious purulent inflammation, which is carried about by the flies. The result is that the disease is terribly prevalent among the juvenile inhabitants of Egypt even when furthest away from the desert sands. In the case of travellers and foreign residents who have come from temperate climates, the disease is, of course, greatly aggravated by the glare of the sun; and in many cases seems to be traceable to no other cause than some slight irritation (cold, etc.), which has set up congestion of the mucous membrane, this being subsequently aggravated by the exposure to the heat and light of the tropical sunbeams.

The best preventive of this disease is the use of good coloured spectacles, which will, of course, pro-

tect from both sand and sun. Great care should be taken to avoid infection, when any is known to exist in the neighbourhood, and to avoid any irritation (by the accidental introduction of foreign bodies, dirt, etc., into the eyes). When the disease has set in, the assiduous application of a lotion of sulphate of zinc (two grains to an ounce of water) will be found beneficial. If there is much pain and irritation, the occasional dropping of a solution of sulphate of atropine (four grains to the ounce of water) will relieve, or the introduction of an atropine disc under the lid.

Sea-Sickness.

At the outset of every journey which the native of the British Islands is about to undertake, the trouble of sea-sickness is the first medical obstacle which he is necessarily obliged to encounter. Occasionally, of course, a traveller is met with who has been originally gifted by nature with the enviable faculty of being "a good sailor," and, accordingly, always escapes with impunity the disagreeable trials which this very unpleasant illness imposes on his less favoured contemporaries, but such an individual is always an exceptional specimen.

The first advice, then, we would give to every traveller who is leaving the shores of his native country is to make a comfortable (but by no means an excessive) meal of easily digestible food, a little before getting on board. (The previous precaution of having the bowels well cleared out should also be taken in every case.) As soon as the vessel is

under way, he should, if at all threatened with gastric weakness, retire comfortably to his berth, place his head as nearly as possible on the same horizontal level with his body, wrap himself warmly up with blankets and rugs, and have a hot jar applied to his feet. A hot linseed-meal poultice applied to the region of the stomach will be found to have a very sedative effect. If this cannot be procured without inconvenience, a mustard leaf applied to the pit of the stomach for about ten minutes will form a pretty good substitute. Having adopted these measures, the traveller should try and compose himself to sleep, and if successful, there is little doubt that he will find that he has successfully tided himself over the evils of the first day. Other precautions and remedies that may be adopted with benefit in troublesome cases are: sucking small pieces of ice from time to time; drinking a cup of hot, strong coffee before lying down; taking a dose of chloral —about twenty grains in two ounces of water, or two ten-grain tabloids; dilute hydrocyanic acid—thirty-two drops of this liquid may be added to two ounces of water, and a teaspoonful taken every half-hour.

Intestinal Worms.

The ova of these parasites are taken into the intestine with imperfectly cooked food, or with impure water (unfiltered or unboiled), and being thus allowed to retain their vitality, they develop and reach maturity in the position which is naturally best suited to them. They give rise to

various intestinal troubles, in the way of griping pains, disordered appetite, flatulence, diarrhœa, straining, etc., and sometimes (especially in the case of nervous individuals) to grave reflex nervous symptoms. The diagnosis of their presence can hardly, however, be made with certainty till a part or the whole of the worm has passed during a movement of the bowels.

There are three great varieties of intestinal worms to which human flesh is heir: *thread-worms*, which are always found in the lower part of the bowel; *round-worms*, and *tape-worms*, which always develop in the upper regions of the alimentary canal.

Thread-worms are almost always found in children, and can easily be got rid of by injection of a bitter infusion, such as infusion of quassia, or salt and water. Their presence is always denoted by the intolerable itching to which they give rise; the irritation of their movements also sometimes gives rise to so much straining as to cause prolapse of the lower portion of the bowel. Accordingly, they always require immediate attention, but the treatment recommended is sufficient, and they do not call for the administration of medicines by the mouth. Thread-worms are rarely found beyond half an inch in length.

Round-worms grow to the length of a foot or more. The symptoms of their presence are less definite than in the case of the thread-worms. They can, however, be always expelled by the use of proper medicines. The best of these is, certainly,

santonin. A full dose for an adult is about six grains. It is always well to prepare the intestine —and the parasite—for the full effect of the remedy by the use of a brisk cathartic. Another full cathartic dose should be administered about five or six hours after taking the santonin. For children of three to five years old, one grain will probably be found sufficient; in either case a second and third dose may be repeated on alternate nights if the worm has not been expelled by the first. After seven years of age, the dose may be increased proportionally.

Tape-worms usually occur singly, but the scantiness of number is liberally compensated for by the enormous length to which the solitary individual grows, and by the apparently almost unlimited power of reproducing its segments, when a part is broken off. The *oil* (often very misleadingly called the "liquid extract") of male fern is probably the most effective remedy for this parasite. After clearing out the bowels thoroughly, half a teaspoonful of the remedy may be given, well beaten up with yolk of egg, and flavoured with a little more than half a glass of cinnamon-water. The head and neck of the worm must be expelled before the cure is effective, as otherwise the segments are always reproduced. Oil of turpentine is another excellent remedy for tape-worm. For this purpose it must be given in large doses—a couple of tablespoonfuls or more.

Egyptian Chlorosis.

Another intestinal worm, less familiar to inhabitants of the British Isles than those already mentioned, is the *Sclerostoma duodenale*, a small parasite often found among the natives of North-Eastern Africa. It makes its habitat in the upper segment of the small intestine; and from the irritation of its presence, and the loss of blood which it is likely to cause from time to time, gives rise to the symptoms which have received the name of *Egyptian Chlorosis.* As this name suggests, the prominent symptoms are those of general poverty of blood, with its concomitants of weakness, lassitude, pallor, etc. To the presence of the same intestinal parasite has been attributed the epidemic anæmia which prevailed among the workmen during the construction of the great St. Gothard Tunnel, and also the variety which is usually known as "miner's anæmia." I do not, however, propose to discuss its connection with these diseases.

The parasite which produces this disease is most effectively dealt with by the use of oil of male fern, which may be administered in the same way as recommended for tape-worm.

Hæmaturic Fever.

The most malignant type of malarial fever is that known as the *hæmaturic*, from the fact that the colouring matter of the blood is passed in large

quantities with the urine during the disease. For the same reason it is often popularly designated the "*blackwater*" *fever*. In this disease there is an aggravated type of remittent fever present, accompanied by yellowness of the skin and whites of the eyes, and darkening of the urine—by the colouring matter of the blood—which comes to resemble XX stout in appearance and tint. There is also very severe bilious vomiting. The patient's strength rapidly becomes exhausted, and the failure of the vital powers is so great in bad cases that he soon sinks into a state of extreme collapse, and even unconsciousness. Some cases are so malignant in character that there is little hope from the effects of treatment, even from the outset. The fever, however, seldom takes on so malignant a type, except in the case of individuals whose systems have been previously lowered by illness, exposure, anxiety, or bad food. This deadly disease carried off my comrades, Mr. J. S. Jamison and Captain Stairs, of the Emin Pasha Relief Expedition. When pretty well exhausted after crossing Equatorial Africa, I was myself brought to the brink of the grave by the same affection. There is no doubt that it is one of the most deadly of the enemies which the weary African explorer can meet with.

When occurring in the case of a person in previously tolerable health, the treatment of this form of fever should be conducted on similar lines to that of a case of severe "remittent." In the very malignant forms the only hope for the patient is in careful nursing, and liberal use of stimulants.

Guinea-worm.

The Guinea-worm is one of the parasitic pests of the north-eastern section of the African continent. Curiously enough, its presence seems to be confined to the countries near the Red Sea, and when found elsewhere it appears to have always been exported from that part of the world. It displays a selective affinity for the subcutaneous tissue of the lower limbs; and, on that account, it was believed, till comparatively recently, to find its way by burrowing through the skin. It is, however, now well known to find its way into the body through the alimentary canal (with drinking-water, etc.). A fresh-water crustacean acts as "intermediate host" in the development of the ova. The impregnated female appears to be the only one which causes trouble afterwards. She finds her way through the various tissues to the skin of the feet and legs, where her presence causes very painful inflammatory swellings. The skin over these ulcerates; and the parasite is thus eventually discharged. The coiled-up worm lies in each of these swellings, and its outline can sometimes be made out on palpation.

The proper treatment is to expose a part of the worm—the head if possible—and draw out a portion very gently: then coil it round something, such as a little roll of adhesive plaster. Gentle traction will then extract a little of the body, which should be rolled carefully around the supporting object. The latter should be fixed in position with plaster,

and the traction must be daily repeated till the whole has been got away. Great care must be taken not to use much force, as this would break the worm across, an accident which is always followed by the formation of very painful abscesses.

Scurvy.

One of the troublesome diseases to which the uncared-for traveller is sometimes exposed when far from home is scurvy. It can only arise when a supply of fresh vegetables has been cut off for a considerable time. When the nature of the disease was not understood, and sea-voyages were slow and prolonged, before the introduction of steam, sailors were often terribly afflicted by this scourge of seafaring life. Modern advances in ships, and in medicine, have changed all that, and the disease is now one of comparative rarity; but it is still sometimes met with, and must always be guarded against by the traveller who expects to be long absent from the refinements of modern cookery, and long debarred from a supply of fresh vegetables.

The disease is ushered in by the symptoms of anæmia and lassitude, followed by subcutaneous hæmorrhages, especially in the lower extremities. When the proper remedies are not forthcoming, the skin gives way, and fungous bleeding ulcers form; the gums also become spongy, ulcerate, and bleed profusely. When further prolonged, even the mucous membrane of the intestine ulcerates, the patient sinks into a state of extreme weakness, and

dies. Such cases were common among sailors in bygone days, but are now happily rare.

Scurvy is always a perfectly preventable disease. A supply of fresh vegetables is an absolute safeguard against its onset. When these cannot be procured, or such a supply would be too cumbrous to convey, a proper supply of lime-juice forms a reliable substitute. When the disease has set in, the patient should at once repair to some locality where lime-juice or fresh vegetables can be procured. If far advanced the weakness and ulcers must be treated on general principles in addition to the use of the requisite anti-scorbutic diet.

RULES FOR THE PRESERVATION OF HEALTH IN THE TROPICS.

(*Taken from "Experiences in Equatorial Africa," page* 15, *by* T. H. PARKE.)

Water. All drinking-water, no matter how sparkling and pure, should be invariably boiled to ensure its freedom from dangerous constituents. Cold weak tea, without sugar or milk, is best for the march. Water should always be drawn from up-stream, and from the centre, if possible. Two grains of permanganate of potash to the quart purifies water. If muddy, use alum.

Sun. No precautions can be too great for protecting the head from the direct rays of the sun. The use of a proper head-dress and umbrella, also a spinal pad for morning and evening sun, is judicious.

Chills, draughts, sitting in damp clothes, especially when heated after violent exercise and copious perspiration, also cooling of the body suddenly in any way, are certain to be followed by fever.

Clothing. The bodily temperature should be kept as equable as possible. Loosely fitting woollen clothes are preferable. Light *kămārbănd* should be worn day and night. On halting after a march put on a wrapper so as to cool gradually. Get under cover and change, if possible.

Sleep as far as possible off the ground, and always under mosquito curtains at night.

Diet should be plain: meat, fish, vegetables, well-boiled fruit, rice, and cereals.

Alcohol habitually, especially during the day, is most dangerous; medicinally, on occasions, it is useful.

Tub in the early morning, or at the end of a march, before cooling, never while digestion is going on, and always tepid, if possible.

Camp. Select highland plateau near water supply. Don't disturb the soil. Avoid ravines. Never to leeward of a swamp, unless separated by a belt of trees or a river. Site of latrine should be selected immediately on halting, and covered with a hurdle and sods so as to exclude flies, as they convey blood poison —leaving only a few openings, each about one foot square. Directly tent is pitched hoe a gutter close to the walls.

Cleanliness. Hair should be cut short.

LIST OF USEFUL ARTICLES

For One Person to take on an Expedition, calculated to last Two Years, and making Four Men's Loads not exceeding Sixty Pounds each.

Tent, measuring seven feet every way, two and a half feet walls, with poles and fly made from "green rot proof" canvas; pole-strap, mallet, twelve long galvanized pegs; not to exceed 60 lbs. in weight. (Benjamin Edgington, London.)

Valise, made from strong waterproof canvas, to hold "Parke African bedstead," folding armchair (brass fittings), hair mattress, bell-shaped musquito curtain, with the apex suspended from a hook, fine gauze to make a few cylindrical veils for keeping off flies, etc.; two *long* blankets; waterproof ground sheet, about six feet by five feet, so as to improvise a *Tente D'Abri* if required; portable indiarubber bath and basin; small down pillow, with six washing covers, also clothes packed into valise pillow. Not to exceed 60 lbs. in weight. (Ross & Co., Elliss Quay, Dublin.)

Canteen, containing three circular steel cooking-pots, nested, having movable handles; one coffee-grinder, one mincer, one gridiron, and one ladle, with movable handles; three enamelled plates, shaped like saucers, to

fit one within the other; one hot-water plate; knife, fork, and spoons (tea, salt, and soup); three pudding-tins, nested; enamelled teapot, and kettle, one wicker-covered china teapot, and cup and saucer; three enamelled goblets, containing about a pint each, nested; tins lined with glass for salt, pepper, mustard, tea, coffee. *Saccharine* tabloids, grs. ½, most excellent substitute for sugar. The whole contained in galvanized bucket, useful for drawing water, and covered by a lid which can be utilized as a frying-pan.

Box, *trunk*, or *portmanteau*, tin japanned, air-tight, oblong in shape, or solid leather, or basket-work covered with pig-skin, and lined with zinc, to contain books, *i.e.* Bible, large "Whitaker," "Hints," R.G.S. Diary, etc., papers, waterproof envelopes, "toilet paper," ink in pellets, pencils, maps, ink-erasure, stylo pen, gold nibs, sketching materials, matches in luminous boxes, clothes, camphor blocks to keep away insects, etc. A waterproof canvas kit-bag is most useful for clothes only. When packed not to exceed 60 lbs. in weight.

Head-dress, helmet, army regulation, with puggaree; night-cap, and soft cap (deerstalker). (Hawkes, London.)

Water-bottle, ebonite, covered with felt, to hold one quart.

Lantern, "Beresford" folding, for oil or candles. (Silver & Co., London.)

Belt, "Colonial" leather waist, with strap over right shoulder, sheath for unclasped knife, holster for light revolver, and small pouch, containing ammunition, a flint and steel, bi-convex burning-glass, and alarm whistle, on swivels.

Hammock, portable field, and, made of cord, useful to sleep in or for transport.

Filter, pocket, asbestos or charcoal.

Umbrella, with three spare covers (green).

Knife, pocket, skeleton, containing one blade, cork-screw, tin opener, champagne opener (useful to open boxes, etc.), screw-driver, gimlet, tweezers, brad-awl.

Boots: brown shooting, four pairs; three pairs of Veldtschoons: the former to be smeared with dubbin. Spare laces and a pair of boot-trees.

Leggings, leather, one pair reaching to the knee, and one short pair merely to cover the top of the boot.

Pyjamas, silk and wool, with feet to keep out insects, six suits.

Waterproof coat, warm overcoat and one knitted jersey.

Knickerbockers, woollen material three pairs, to be loose, and securely fastened by buckle and strap beneath the knee to prevent insects getting up; one pair of moleskin knickerbocker-breeches for riding.

Drawers, calico, short and loose, half-dozen.

Stockings, knitted, shooting, six pairs; socks, six pairs.

Waistcoat, chamois leather, buttoning to the throat.

Tennis suits, flannel, for lounging in camp, two.

Putties, light woollen material, in fancy colours, two pairs.

Shirts, silk and wool, well shrunken, and loose about the neck, one dozen.

Vests, light silk, six.

Gloves, leather gauntlet, three pairs.

Kămărbănd, silk, two.

Handkerchiefs, red silk, two dozen.

Towels, two bath and six small.

Holdall, containing hair, shaving, and tooth brushes, scissors, razors (two) with strop, comb, soap, sponge, and looking-glass.

Housewife, for needles of various sizes, bodkins, thread, buttons, palm and sail needles, tape.

Napkins, table, one dozen.

Compass, pocket magnetic (luminous).

Field-glasses, one pair.

Fish-hooks of various sizes, with line and baits.

Flea-powder, two tins.

Baking-powder, to make bread rise.

Medicines, small pocket-case, in tabloid form. (Burroughs, Wellcome, & Co., London.)

Goggles, green colour, two pairs.

Trap, American wire, for catching birds, rats, etc.

Circular spring, for weighing.

Tape measure.

Haversack, for carrying luncheon, etc.

Tools, and spare screws fitted in small leather hand-case.

Extras. Arrowroot, sago, beef-tea, "Liebig," three tins of each; brandy, two bottles; curry-powder, anchovy paste, Erbswurst, custard-powder, "composition" foods, celery salt, etc.

COOKING.

A few elementary principles of cooking are essential to the traveller, who may at any time have to cook his own food. A good general rule as to the length of time required for a roast or boil is fifteen minutes to the lb.

Boil. The meat should be plunged into boiling water, temperature 212° Fahr., so that it may become coated with coagulated albumen, thereby sealing the pores, and imprisoning the juices, then the temperature may be allowed to stand at 180° Fahr., so that it will *simmer*, and not boil, keeping the lid on; the meat does not then become hard and indigestible.

Roast should be done on the same principle as boiling, viz. first expose the meat to intense heat so as to retain the juices, afterwards cook slowly, saving the fat; keep constantly turning and basting.

Stewing causes the constituents of the meat to be dissolved into the liquid medium. Meat should be cut into small pieces covered with cold water, and mix vegetables, flour, salt, rice, and a few peppercorns. It should be done at a low heat, slowly for one hour. The addition of a little vinegar is useful, and an agreeable condiment.

Fry and broil are adapted to small pieces of meat about one inch in thickness; if a fowl, it should be split open first. The object is to cook by dry heat *over*

a clear, smokeless fire, and retain the juices. The meat should be turned only once, and grease should always be used for the bars of the gridiron and frying-pan.

Soup. To each pint of cold water there should be allowed one pound of meat (cut up), one pound of bone, half an ounce of flour; vegetables form an important addition; the whole to *simmer* for two hours.

Meat or Fish should never be used if decomposition has set in; if infested with parasites it should be thoroughly cooked. Boiling will kill any parasite; otherwise very severe, if not fatal, gastro-intestinal irritation will follow its ingestion. Fat is so essential for cooking that none should be wasted. Melted butter is the foundation of sauces. Meat or fish can be preserved by heating the outside very strongly; cold—in ice; complete exclusion of air; salting; cut in long narrow pieces and dry in the sun, or smoke over a slow fire.

Vegetables should all go into boiling water, with about two tablespoonfuls of salt to the gallon. They should be cooked in the same saucepan with meat, if possible; the flavour of both is thereby improved.

Puddings are easily made from eggs, milk, semolina, maccaroni, arrowroot, banana flour, sago, tapioca, rice, etc.

Condiments, such as curry powder, relish, catsup, etc., etc., improve the appetite.

Flour, by the action of cooking, has its starch changed into dextrine and its albumen becomes coagulated. Unfermented cakes (or dampers) are nutritious, and easily made where biscuit and bread are not procurable; the dough is simply placed in a hole in the ground which has been well heated by fire, and then covered over by the red-hot cinders and ashes which are heaped

on an iron plate placed over the hole until the cake is made; milk, eggs, etc., may be added.

Biscuit is made by prolonging the above process of baking, care being taken not to burn.

Bread is baked as above; but leaven, such as yeast or baking powder, must be added to ferment the dough, to which a little salt and potato are added. Old bread or biscuit when soaked in water and rebaked becomes palatable.

Tea should not be made from water containing either *lime* or *iron*. The water must be *boiling*, and is then poured upon the tea-leaves and infused for five minutes before drinking; it has a very restorative action.

Coffee is best when made from the freshly roasted berry, which is then ground. It must be infused, and not boiled. It is invigorating and stimulating, and is useful during exercise and fatigue.

TRANSPORT.

The prospective traveller should give attention to the ways and means by which those debilitated by sickness, or rendered helpless by wounds or other injuries, may be conveyed when movement is necessary. The mode of transport adopted should be regulated in such a way as to prevent, as far as possible, any aggravation of the existing weakness or pain. The recumbent position is, of course, by far the best—the easiest and safest—for almost all cases. It is only for wounds and other injuries of the upper part of the body that the sitting posture can sometimes be preferred. In such cases, the "four-hand seat" (or "sedan chair" of school-boys) forms a comfortable conveyance. Two assistants are required; each grasps his own left forearm just below the elbow, and with the disengaged left hand grasps the right forearm of the other, also below the elbow. The patient is then raised into the seat so formed, and supports himself by placing his arms round the necks of the bearers. Two bearers can also, of course, carry a patient who is prostrated by loss of blood or other weakness, in the horizontal position for a short distance, by standing side to side, and holding the forearms in a horizontal position, while the patient himself partially supports himself by grasping the shoulders of the bearer who is next his head.

Of the modes of conveyance which are prepared for the transport of the sick and wounded, the stretcher and hammock are the simplest. The former, with the addition of a pole on each side, forms a very simple and very efficacious means of transport for moderate distances. Two bearers may be employed; four if the services of so many are available. A hammock made from either cord or canvas suspended from a single pole is often employed, the ends supported on the shoulders of two bearers. When nothing else can be procured, a great-coat, with the sleeves turned inside out, and through which two rifles, poles, or pikes are passed, will be found to answer the purposes of an improvised stretcher fairly well. In the use of all such modes of conveyance it is very desirable that the movement of the bearers should be as gentle as possible. The steps should always be short, and the front and rear bearers should always break the step, by starting with opposite feet. This prevents dipping from side to side, which would be, of course, very distressing to the patient.

Animals can, of course, be employed as modes of conveyance for the sick and wounded. Whenever they are so utilized, the preference should be given to the smaller ones—such as mules, ponies, and donkeys. The invalid is then more readily raised into position, and more readily taken down. It is hardly necessary to say that a steady, even gait, combined with a fair amount of strength and power of endurance, are to be looked for; and not at all such qualities as high mettle, showy action, or speed. A *litter* can be easily improvised, when the animal has been chosen. The rapidity and efficiency of the Arab method of conveying their wounded from the field of battle has often been

commented on, and is well worth mentioning here. Mules are used for the purpose, and are kept ready saddled. Two large sacks, stuffed with straw, grass, etc., are firmly corded—one on either side of the pack-saddle, and the grooves between these and the saddle are filled by stuffing of similar material. On the litter so formed a cloak is thrown, and the helpless invalid is then placed *across* the animal, lying in the recumbent position on the bed so prepared. This arrangement reduces the jolting of the patient to a minimum. If the emergency is very great, the person so placed can be secured by tying, and can then be conveyed at a gallop, out of the reach of shot, etc. When there is a large party of travellers, supplied with all the luxuries of transport, there are usually no such difficulties met with as those I have implied. The presence of a sufficient number of attendants, with animal transport, and properly prepared *litters* and *cacolets*, will obviate the necessity for the consideration already given.

Wheeled conveyances may, of course, be utilized when there are roads. Some other modes of conveyance may be mentioned, which have been from time to time employed instead of the more primitive stretcher or hammock, viz. the Himalayan *dandy*, the *trag-sitze* of the Germans, the New Zealand *amoo*, the Indian *dooley*, the Chinese *palanquin*, etc., etc. Any of these may be employed, when procurable, in the conveyance of the sick and wounded. Ox-hide and bamboo are nearly always at hand in Africa, and are useful for making improvised stretchers at the shortest notice.

DISINFECTION.

The subject of disinfection is one to which too much importance can hardly be attached in the present state of our knowledge of medicine and surgery. Whatever doubts may be expressed about the value of the additions which the advances of modern science have made to the curative methods at our disposal, there can be no question raised as to the progress of the ways and means of preventive medicine. It is to its advances that we owe the blessing of being able to combat with the attacks of epidemic diseases in the present age; and there can be little doubt that, when fully utilized, the knowledge at our disposal will, by-and-by, enable us to remove them altogether from the catalogue of ills of human life.

The best disinfecting agents at our disposal have also the advantage of being portable, and a fair supply can be conveyed by the traveller to even the remotest regions of the earth. The well-known Condy's fluid—used in the proportion of one or two tea-spoonfuls to a pint of water—still remains one of the most convenient and efficacious of the disinfecting washes, and can be applied with advantage to any surface, animate or inanimate. Solutions of perchloride of mercury, and of the biniodide, are also among the most useful and convenient—indeed are among the very best antiseptics now known to the medical practitioner.

Solutions of carbolic acid were, as is well known, the first to obtain a high reputation in this department; but their efficacy is not at all to be compared to that of the more recent additions to the armamentarium of the hygienic physician. The application of heat is undoubtedly the most reliable of all methods of destruction of the infective germs of disease. Very few pathogenic microbes can survive exposure to the temperature of boiling water for even a moderately short period. Articles of clothing, etc., can in this way be rendered perfectly innocuous after contamination, if an apparatus is procurable by the aid of which they can be exposed to a temperature a little above the level of boiling water. Under-clothing and bed-linen can, of course, be boiled for a prolonged period; and if an oven is at hand, all textile fabrics can be thoroughly disinfected by an hour's exposure to a temperature of about 200° F. Almost every article of clothing can bear a temperature considerably higher than this.

One of the most reliable of disinfectant applications, where the effects of heat cannot be utilized, is sulphurous acid gas, which can be generated by the combustion of sulphur, or—as now available—when evolved from a concentrated solution. Exposure to this gas in a closed space for a couple of hours will destroy all germs of disease attached to articles of clothing, furniture, etc.

EMBALMING.

The venerable process of embalming still preserves a certain proportion of its antique interest, especially to tropical residents. It has of recent years been carefully studied and elucidated by the veteran hygienist, Dr. B. W. Richardson. An excellent fluid for the purpose is that recommended a considerable time ago by this writer, prepared by saturating five pints of water at 50° F. with zinc chloride; then adding one pint of rectified spirit and two fluid ounces of the officinal hydrochloric solution of arsenic. This fluid can be used to fill the blood-vessels, and will be found an efficacious preservative. For injection I would recommended the femoral artery, which can be readily exposed in the middle of the fold of the groin. When the vessel has been exposed and opened, the nozzle of an injection syringe, carefully secured so as to prevent loss of the fluid, will soon fill the whole of the vessels of the body. The fluid passes through the vessels more easily if the body is placed in a hot bath, about 130° F. It is also better done when not attempted till the *rigor mortis* has passed off. The nozzle of the syringe may be first directed upwards so as to fill the vessels of the upper part of the body, and of the opposite limb; it may be afterwards turned downwards so as more readily to permeate the vascular

system of the lower limb on the side on which the operation is being carried out. The syringe may then be left in position for six or eight hours. Before closing the opening in the vessel, four to six ounces of a watery solution of sodium silicate should be injected, which makes a perfect coagulum on mingling with the cloride of zinc solution, and thereby effectively prevents the escape of any of the preserving fluid. The artery may then be tied, and the opening in the skin neatly closed with sutures. This injection preserves the tissues admirably, and restores the form and expression of the features.

As the intestines nearly always contain a good deal of gas after death, it is desirable to puncture with the needle of an aspirator, and withdraw it. Six fluid ounces of zinc colloid should then be thrown in through the opening, prepared by dissolving zinc chloride in equal parts of alcohol and collodion, in the proportion of five grains of the salt to one ounce of each of the fluids. The puncture can then be closed with a single stitch.

Dr. Richardson has also devised an extremely ingenious method which he has called "needle embalming." This requires no cutting operation. The following solution is used:—"Five hundred grains of zinc chloride, dissolved in three pints of methylated spirit, to which is then added one pint of ·830 ethylic alcohol and half a pint of chloroform containing, dissolved in it, one hundred and twenty grains of benzoic acid." This fluid is injected into various parts. The injection is first thrown into the cranial cavity by passing the needle through the orbit at the inner angle of the eye. The fluid is then thrown in slowly—one pint on either side. Half a pint is then thrown

into either side of the cavity of the chest, and a corresponding quantity into the interior of the heart. A smaller needle is then used to inject into the subcutaneous tissues of the limbs and trunk at various points—three ounces for each upper extremity, four ounces for each lower, and six ounces over various parts of the trunk. The whole body is then swathed in a series of flannel bandages saturated with the following solution :—

Pure tannin 250 grains ; ethylic alcohol (sp. gr. ·830), ten fluid ounces ; collodion, nine fluid ounces ; balsam of tolu, one fluid ounce ; gum benzoin, until it ceases readily to dissolve.

If the body has then to be transmitted to a long distance, it should be thoroughly wrapped up so as to exclude the air completely ; the enshrouding garments being sprinkled or sprayed over with two fluid ounces of benzoated chloroform.

SMALL-POX.

Small-pox is one of the diseases for which the intending traveller had better make provision in time. Even if successfully vaccinated himself, he will have a fair chance of having to deal with it in the persons of his tropical companions or attendants.

As is well known, the disease begins after a definite period of incubation of twelve days, and is accompanied by high fever and a characteristic severe pain in the lower part of the back. The eruption appears on the third day of the illness—first and most copious on the face. At first it is in the form of solid papules: these become vesicular on the fifth day, and on the eighth day pass into the form of pustules, which have the tendency to involve the true skin, and thereby produce permanent scars.

The disease is terribly fatal when it appears in a community where vaccination has not been practised. On this account it would be well for every traveller of mature age to be re-vaccinated before plunging into the depths of tropical regions. A supply of vaccine lymph should also be among the contents of the medicine-chest of the explorer or resident in any foreign country. The lymph can be applied to the skin on careful erasion of the cuticle. When the operation has succeeded, a papule appears on the spot on the

third day, and runs a course very similar to that of a small-pox pustule. The upper third of the arm is usually selected for the operation: the vaccine lymph should be applied in three or four places. The members of the Emin Pasha Relief Expedition were vaccinated previous to crossing Africa in 1887, '88, '89, when they were exposed to epidemics of small-pox. "But four cases occurred among all our men, and all of them recovered; while the unvaccinated Manyuema all around them contracted the most virulent forms of the disease, and died in great numbers." The logical deduction is, that vaccination protected the expedition from the disease. The axillary glands may become a good deal inflamed during the development of the subsequent symptoms: in every case the patient should take as complete rest as possible during the development of the symptoms.

For small-pox itself, the treatment should be as in other fevers; perfect rest, careful nursing, and fluid diet. One of the most dreaded evils of the disease is, of course, the pitting and scarring of the skin of the face which is so prone to follow a severe case when the eruption has been copious. The best prevention of this very unpleasant consequence is careful puncture and evacuation of the contents of the individual pustules. After this the surface should have an antiseptic solution applied twice a day. A little carbolic oil, or a weak solution of corrosive sublimate (2 grs. to the ounce) will answer the purpose. The face can then be kept covered with cotton wool.

INDEX.

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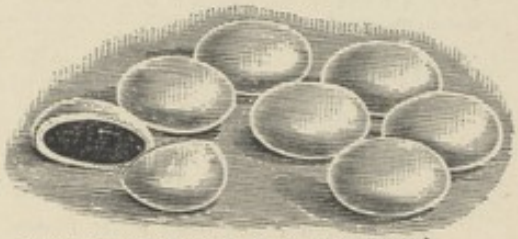

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