

is much to be regretted, as a good *gravure* of an indigenous Gaul would be invaluable. These clever fellows got at last to polishing their hatchets of flint and spear-heads, and there are numbers of very fine specimens of such work, the interest in which is somehow not so great as that excited by the sight of the very stones on which the celts were grooved and polished, with the fissures and grooves as plain in them as they were the very day when the needy celt grinder was disturbed at his labour by the propinquity of an auroch or the sudden onslaught of a cave bear. In spite of their polished manners in hatchets and the like, the *genus homo* had such hard times of it that he took to a beaver sort of life, and at last fled to locustrine habitations, which give to the antiquarian the Third Period of these stirring times, when it was a fight between him and the creatures he would have probably hesitated to call "the inferior animals." He now achieved pottery, and made bodkins and needles of bones, and had horses, cattle, goats, dogs, and sheep, about him, as their bones are found in his dwellings, but there is no trace there of the animals which are called extinct or *émigrés*, and which characterised the first and second epochs of the Stone age. Why they became extinct it is not easy to imagine. They might have emigrated *en masse* as soon as they found their food had gone off to become the prey to rheumatics in lacustrine lodgings, but even that point requires faith or elucidation. We next come to the age of transition, when a lucky fellow got a piece of metal and flourished it about in triumph among the pure and simple lapidarians.

"The articles got out of 'dolmens,' in France and Savoy, which it may not be remembered by us all is now part of France, furnish most remarkable shelves. The names of the proprietors are affixed to the articles, and we are enabled to see that many persons in France are interested in such collections. There is a whole armoury of flint implements in the first and second halls; and it speaks well for the honesty or want of fraudulent enterprise on the part of the people that there are comparatively few specimens of uncut and unpolished hatchet-heads of the Stone period, when it is considered how easy it would be to fabricate them, and how difficult to decide whether a tool of that sort was ten thousand years or a few days old.

"In the second age of cavern life, the reindeer played, as we have said, an important part, and his bones and horns were turned to good account, but the elephant primigenius still held on—or is supposed to have done so, though it might be argued that the discovery of his molars here and there in the remains of the period proves nothing. In this epoch we have a human jaw-bone, and there is a whistle made of the phalanx of a reindeer, with a hole bored through it, which it would be hardy to say was ever played upon by the jaw in question, because it was found with it at 'Laugerie Basse.' The luxurious tastes of *homo* now become apparent in barbed arrows and harpoons—he was getting a taste for fowl and fish, and had learnt to grind up grain in a mortar, and had invented a marrow spoon! at least, say Messrs. Lartet and Christy of an instrument, that in it "*on a cru reconnaître une cuillère d'extraire la moelle des os*" (but they add two notes of interrogation), and had taken to using fire rather liberally, and to immense carving on reindeer horns. It is curious, indeed, to find in one of the cases of relics from the Dordogne caves two pieces of bone exactly the same as those which the natives of the Marquesas Isles wear in their nostrils at the present day, along with teeth of animals pierced for ornaments, and the bones of horses, foxes, wolves, wild boars, belonging to a

period when man, in spite of marrow-spoons and ruffles, must have looked on hunting as a very serious occupation.

"From sepultures, dolmens, and caves of the third epoch in the second age of stone, we get granite mallets, polishing blocks of sandstone, hatchets of diorite, ophite, aphanite, jadeite, fragments of earthenware, carved deer and other bones, bones of pigs and dogs, along with those of the animals already spoken of in the former epoch, except the reindeer, which suddenly goes off to Norway, and we lose sight of Lartet and Christy completely at this period. M. M. Pommerol shows a case which, in addition to eight blades and scrapers of flint and a hatchet of fibrolithe, contains some carbonized or half-burnt barley; and one human jaw-bone is exhibited by M. de Lavaud; but there is a good deal of uniformity in the objects of this epoch, in spite of the introduction of the dog. We move on to the next, which is that of transition — the first appearance of metal. Although the collections are meagre enough, there are some interesting specimens in this period. Bronze blades appear, and the use of it is seen in the facility with which teeth and bones are cut and pierced, and the number of ornaments for the neck."

The context of this dark riddle concerning man's first appearance in western Europe, shows him not as a resident, but a visitor, working and using rough flint tools, amidst an assemblage of great and fierce animals no longer existing, and amidst conditions now only existing near the Arctic regions. We next see the remains of the long-continued action of land-waters which accompanied the lowering of the temperature, throwing down deep beds of gravel and loam. With this amelioration we come to a reindeer period, and man as a resident without the use of metals. Next comes a race bringing foreign stones and more art, but with similar habits, mingling with the former people, raising lofty tombs and temples, soon obtaining bronze instruments, and living on to the era of history.

The most recent discoveries on this subject are, first, of flint implements, precisely similar in form to those from the Somme Valley, spread for hundreds of miles along the Madras coast, and up to a height of 300 feet on the slopes, in a formation called *laterite*, the equivalent of our gravel bed. No other remains have yet been found. Second, a whole village of the polished stone period, without trace of metal, but with gracefully-shaped pottery, mortared walls, carpentry in olive-wood, elegant art in flint and volcanic stone tools and utensils, found under pre-historic ash-beds at Santorin, amidst the successive volcanic emissions which have destroyed a once-flourishing group of islands.

DR. JOSEPH DALTON HOOKER, F.R.S.,

PRESIDENT OF THE BRITISH ASSOCIATION.

WITHIN four days of his lamented death, on the 12th of August, 1865, Sir William J. Hooker was superintending improvements in the Royal Gardens at Kew, of which he was the director; and which in so many respects he had enriched and adorned by his fine taste, his scientific knowledge, and his untiring energy. His son, Dr. Joseph D. Hooker, a botanist not less distinguished, and who was already assistant-director at Kew, was appointed to the vacant post of director on the 12th of November following. In his first report addressed to the Commissioners of Woods and Forests, dated 1st January, 1866, Dr. Hooker thus speaks of his eminent father: "This is not the place, nor would it be fitting

in me to dwell on the merits of my father; I must, however, claim the privilege of paying such a tribute to the memory of my predecessor as has been unanimously felt to be due to him, viz., that whether as the restorer of these gardens, who, by his sagacity and energy, raised them above all others in excellence, beauty, and utility, or as the originator and founder of museums of economic botany; or as the projector and able assistant of those efforts on the part of our home and colonial governments that have led to the formation of botanical and horticultural establishments in so many of our colonies, in India, and in our foreign possessions; or as the liberal and disinterested patron of private scientific enterprise everywhere, and especially amongst the officers of the army, navy, and civil services, the late Director of Kew has won the esteem and gratitude of his countrymen, and left a name that will ever occupy one of the most prominent positions in the history of botanical science." The present Director of Kew is sprung from a race of botanists. His paternal grandfather, a citizen of Norwich, devoted his leisure time to the cultivation of curious plants. This circumstance, doubtless, helped to create that taste for botany which, in the career of his illustrious father, has borne such ripe fruits. On the maternal side—the grandfather of Dr. Hooker was Mr. Dawson Turner, of Yarmouth. The eldest daughter of this gentleman became the wife of Sir William J. Hooker, in 1814. Mr. Turner's is a well-known name in the annals of British botany; he is the author of various botanical publications, and it was at his suggestion that a narrative of a visit made to Iceland in 1809 by his future son-in-law was given to the world, a work which first brought prominently to the notice of scientific men the name of William Jackson Hooker. So descended, Joseph D. Hooker was born at Halesworth on the 30th of June, 1817. Although thus by birth a native of Suffolk, by association and descent the subject of our notice is a Norfolk man. No county of England has produced an array of such distinguished botanists as Norfolk—Smith, Turner, Lindley, the elder Hooker, are all natives of Norfolk. It is, therefore, befitting on the first meeting of the British Association in the capital of that county that a botanist, and especially that Dr. Joseph Hooker, should occupy the position of president.

Consequent on the appointment of his father to the chair of Botany in the University of Glasgow in 1820, Joseph Hooker at a very early age was removed to the metropolis of the West of Scotland. There he grew up and was educated; and qualifying himself for the Medical Profession he took the degree of M.D. in the University. He did not, however, practise medicine, but devoted his attention to various branches of scientific study; and attached himself to the Royal Navy with the view of prosecuting botanical research in distant countries. An opportunity occurred in 1839; in that year Government, for the purpose of Geographical discovery and other allied investigations, fitted out an expedition to the Antarctic Regions. The ships *Erebus* and *Terror*, commanded by Sir James Clark Ross, sailed from Chatham on the 29th of September of that year. Dr. Hooker left England as assistant surgeon to the *Erebus*, and botanist to the Expedition. On the outward voyage Madeira, Teneriffe, and Cape de Verde Islands were visited. A week's stay at St. Helena was turned to account by Dr. Hooker in investigating the vegetation of the island—which he found had been almost entirely changed by the introduction of a new flora. On the 6th of April, 1840, the vessels left St. Simon's Bay. At the rugged, mountainous, and almost desolate

Kerguelen's Island, two and a half winter months were spent—and all the plants were gathered by Dr. Hooker which had been detected by Captain Cook in 1779—a remarkable proof of the uniformity of the climate in the island, and of the comparative mildness of the winter season. From Van Diemen's Land the expedition started for the South Pole on the 12th of November. Lord Auckland's Islands, reached after a week's sail, was the only place in the southward course which yielded plants. The vast extent of continent called on the map Victoria Land was discovered during the voyage, together with an active volcano, Mount Erebus, and an extinct one, Mount Terror. The vessels returned to Hobarton in April, 1841. During a second cruise, three months were spent at New Zealand, and were industriously employed by Dr. Hooker in collecting materials for a flora of these islands. A prolonged stay at the Falklands afforded ample opportunities for thoroughly investigating the flora of that interesting and highly important group. A third and last voyage to the south Polar regions was made from Berkeley Sound on the 17th of December, 1842. Owing to the vast proportion which water bears to land, the farther south the voyager penetrates, the more equable the climate becomes. "All the islands and land southward of 45°," remarks Dr. Hooker, "partake more or less of an inhospitable climate, which though eminently unfavourable to a varied growth of plants, still, from its equable nature, causes a degree of luxuriance to pervade the vegetable kingdom, such as is never seen in climates where the vegetable functions are suspended for a large portion of the year." From his extensive observations in the south Polar regions, the botanist of the expedition was led to draw the following interesting scientific inference: "The remoteness of these islands from any continent, together with their inaccessibility, preclude the idea of their being tenanted even in a single instance by plants that have migrated from other countries, and still more distinctly is forbidden the possibility of man having been the active agent in the dissemination of them; on the contrary, the remarkable fact that some of the most peculiar productions are confined to the narrowest limits, is a strong argument in favour of a general distribution of vegetable life over separate spots of the globe. Hence it will appear that islands so situated furnish the best materials for a rigid comparison of the effects of geographical position and the various meteorological phenomena on vegetation, and for acquiring a knowledge of the great laws according to which plants are distributed over the face of the globe."

Dr. Hooker makes full acknowledgment of the aid he received in his botanical labours from his shipmates—and especially from the commanding officer of the expedition—Sir James C. Ross. That officer placed at the disposal of the botanist his private cabin and library, promoted to the utmost the interests of the collections, and himself gathered many of the plants with his own hands.

The result of the researches, and of the collections made by Dr. Hooker during this the most important and interesting scientific voyage promoted by Government since the days of Cook, was a series of superb volumes on the Botany of the Antarctic Regions—embracing the flora of the Auckland Islands, New Zealand, and Tasmania. These volumes contain valuable introductory essays embodying the knowledge and philosophical views of the author on the subjects of which he treats. Her Majesty's Treasury, in aid of the publication, granted the sum of £1,000, to be expended

solely on the drawing and lithography of five hundred quarto coloured plates: These, together with the descriptive matter written by Dr. Hooker, it may be mentioned, have been given by the author free of all cost and all share of the proceeds of the undertaking

Desirous of adding to his acquaintance with the botany of the Antarctic regions, and of the temperate zones, more knowledge of the tropics than he had hitherto had the opportunity of acquiring, Dr. Hooker again resolved on travel, but hesitated between India



Joseph Dalton Hooker
J. D. Hooker

From a photograph by
 H. T. Whitlock, Birmingham.

to the publisher, who has thus been enabled to bring out the series at a very much more moderate price than would otherwise have been possible.

In this disinterested manner, and with much ability, did Dr. Hooker discharge the task of the preparation of these volumes, entrusted to him by the Admiralty in 1843. Numbering six volumes in all, the first two of the series were published in 1847, the last two much more recently. We may here mention that the Colonial Government of New Zealand entrusted to Dr. Hooker the preparation of a work giving a compendious account of the plants of that colony, and placed at his disposal the necessary funds, including a liberal remuneration for his services. The work was issued, in two parts, in 1864 and 1867.

and the Andes. At length he decided on India, being chiefly influenced by the late Dr. Falconer.* This gentleman drew his attention to the fact of the ignorance prevailing on the geography even of the central

* Dr. Falconer was born at Forres, in the county of Moray, in 1808, and was educated at King's College, Aberdeen, and the University of Edinburgh. In 1829 he received an appointment in the East India Company's service, but before proceeding to India he devoted a year to the study of botany and geology. Superintendent first of the Botanic Garden at Suharunpoor and afterwards of that at Calcutta, it was mainly upon his advice that Government sanctioned the experimental trials of the growth of tea in India which were carried to a successful issue under his supervision. Dr. Falconer returned to England in 1856 or 1857, and during the rest of his life devoted himself to the study of mammalian palaeontology. He was Vice-President of the Royal Society, and died 31st January, 1865. Two volumes of "Palaeontological Memoirs and Notes" have been recently published, edited by Dr. Murchison. (Hardwicke.)

and eastern parts of the Himalayas, while all to the north was involved in a mystery equally attractive to the traveller and the naturalist.

Sikkim was the region recommended to Dr. Hooker as untrodden ground. The journey assumed the character of a Government mission. The collections were to be deposited at Kew, and the traveller was allowed by the Treasury £400 a-year during the time of his travels. "No part," he says, "of the snowy Himalaya eastward of the north-west extremity of the British possessions had been visited since Turner's embassy to Thibet, in 1789. . . The possibility of visiting Thibet, and of ascertaining particulars respecting the great mountain Chumulari, which was only known from Turner's account, were additional inducements to a student of physical geography; but it was not then known that Kinchinjunga, the loftiest known mountain on the globe, was situated on my route, and formed a principal feature in the physical geography of Sikkim." Dr. Hooker mentions the circumstance that his earliest recollections in reading were of "Turner's Travels in Thibet," and of "Cook's Voyages." The account of the Lama worship, and of Chumulari in the one, and of Kerguelen's Land in the other, took a strong hold on his youthful fancy. It was, therefore, singular that Kerguelen's Land should be the first really strange country he visited, and that too in the first king's ship which touched there since Cook's voyage, and whilst following in the track of that illustrious navigator in south-polar discovery; and that at a later period he should have been nearly the first European who approached Chumulari since Turner's embassy.

Starting on his journey, Dr. Hooker sailed to Egypt, in the same steam-vessel which conveyed the Marquis of Dalhousie, the newly-appointed Governor-General of India, on his way to Calcutta. He cordially acknowledges his obligations to that nobleman, for much personal kindness, for procuring him admission into Sikkim, and in honouring him throughout his travels with the kindest encouragement. A series of letters, written by our traveller to his private friends, and published in the "London Journal of Botany," detail the observations made in Egypt, at Aden, Ceylon, and Madras, and also give an account of an excursion among the plains and hills of Western Bengal, south of the Ganges. Dr. Hooker makes special mention, also, of the obligations he incurred to Brian H. Hodgson, Esq., during his two years' stay in Sikkim, and who was for many years British Resident at the Nepal Court.* Dr. Campbell, the

* Mr. Hodgson's high position as a man of science requires no mention here; but the difficulties he overcame, and the sacrifices he made in attaining that position, are known to few. He entered the wilds of Nepal when very young, and in indifferent health; and finding time to spare, cast about for the best method of employing it. He had no one to recommend or direct a pursuit, no example to follow, no rival to equal or surpass; he had never been acquainted with a scientific man, and knew nothing of science except the name. The natural history of men and animals, in its most comprehensive sense, attracted his attention; he sent to Europe for books, and commenced the study of ethnology and zoology. His labours have now extended over upwards of twenty-five years' residence in the Himalaya. During this period he has seldom had a staff of less than ten to twenty persons (often many more), of various tongues and races, employed as translators and collectors, artists, shooters, and stuffers. By unceasing exertions and a princely liberality, Mr. Hodgson has unveiled the mysteries of the Buddhist religion, chronicled the affinities, languages, customs, and faiths of the Himalayan tribes, and completed a natural history of the animals and birds of these regions. His collections of specimens are immense, and are illustrated by drawings and descriptions taken from life, and with remarks on the anatomy, habits, and localities of the animals themselves. Twenty volumes of the journals, and the Museum of the Asiatic Society of Bengal, teem with the proofs of his indefatigable zeal; and throughout the cabinets of the bird and quadruped departments of our National Museum Mr. Hodgson's name stands pre-eminent. A seat in the Institute of France, and the Cross of the Legion of Honour, prove the estimation in which his Buddhist studies are held on the continent of

Superintendent at Darjeeling and the Governor-General's agent in communicating with the Sikkim Rajah, afforded him, likewise, much assistance in obtaining access to that country.

Dr. Hooker thus records his first impression of the Himalayas: "Much as I had heard and read of the magnificence and beauty of Himalayan scenery, my highest expectations have been surpassed. I arrived at Darjeeling on a rainy, misty day, which did not allow me to see ten yards in any direction, much less to descry the snowy range distant sixty miles in a straight line. Early next morning I caught my first view, and I literally held my breath in awe and admiration. Six or seven ranges of forest-clad mountains, as high as that whereon I stood (8,000 feet) intervened between me and a dazzling white pile of snow-clad mountains, among which the grand peak of Kinchinjunga rose 20,000 feet above the lofty point from which I gazed. Owing to the clearness of the atmosphere, the snow appeared to my fancy but a few miles off, and the loftiest mountain at only a day's journey. The heavenward line was projected against a pale blue sky; while little detached patches of mist clung here and there to the highest peaks, and were tinged golden yellow or rosy red by the rising sun, which touched these elevated points long ere it reached the lower position which I occupied. Such is the aspect of the Himalayan range at early morning. As the sun's rays dart into the many valleys which lie between the snowy mountains and Darjeeling, the stagnant air contained in the low recesses becomes quickly heated; heavy masses of vapour, dense, white, and keenly defined, arise from the hollows, meet over the crests of the hills, cling to the forests on their summits, enlarge, unite, and rapidly ascend to the rarefied regions above—a phenomenon so suddenly developed that the consequent withdrawal from the spectator's gaze of the stupendous scenery beyond looks like the work of magic. Such is the region of the Indian Rhododendrons." The above graphic description occurs in the preface to Dr. Hooker's magnificently illustrated volume, entitled "The Rhododendrons of Sikkim-Himalaya," which is edited by his father, Sir William J. Hooker, and dedicated to Her Royal Highness the Princess Mary of Cambridge. These plants were discovered by Dr. Hooker, in his botanical mission, and the drawings and descriptions were made by him on the spot. Another work we may here notice, of which the descriptions and analyses were supplied by Dr. Hooker, bears the title, "Illustrations of Himalayan Plants, chiefly selected from Drawings made by the late J. F. Cathcart, Esq., of the Bengal Civil Service." This publication sprung out of a desire on the part of the author to connect the name of his friend Mr. Cathcart, in consideration of the great services he had rendered to botanical research in India, with the history of the botany of that country.*

While prosecuting his labours in the territories of Sikkim, Dr. Hooker, along with Dr. Campbell, was seized, and for a number of weeks detained a prisoner by a faction of the Sikkim Court, having suffered much inconvenience and many hardships during the period

Europe. To be welcomed to the Himalaya by such a person, and to be allowed the most unreserved intercourse, and the advantage of all his information and library, exercised a material influence on the progress made in my studies and on my travels.—Extract from preface to Dr. Hooker's "Himalayan Journals."

* Mr. Cathcart was devoted to the pursuit of botany, and caused a magnificent series of drawings of Darjeeling plants to be made by native artists during his residence there. This collection is now deposited at Kew, through the liberality of his family. After the expiration of his Indian service this gentleman returned to Europe, and died at Lausanne, on his way to England.

of his captivity. Such of his collections as reached Calcutta were forwarded to England, in excellent order, and placed in Kew Gardens. The Government, influenced by a number of the leading men of science, continued to Dr. Hooker the allowance of £400 annually for three years, to enable him to arrange, name, and distribute his valuable collections, and also to publish his manuscripts.

For the information of future travellers, Dr. Hooker has stated that his Indian journey cost £2,000, of which £1,200 were defrayed by the Government. This sum is, however, exclusive of £200 which he paid for books and instruments, and of the freight of the collections to England. A very ample and most interesting account of the journey was published in two volumes, with maps and illustrations, under the title, "Himalayan Journals; or, Notes of a Naturalist in Bengal, the Sikkim and Nepal Himalayas, the Khasia Mountains, etc."

Of Dr. Hooker's travels in the East, the late Professor Edward Forbes thus speaks: "To ramble among the mightiest monuments of the earth, to wind, as it were, in and out among the vertebræ of the old world's backbone, must be a great pleasure to any traveller. How much more to one who is thoroughly trained and experienced in research, a naturalist of the first degree. Dr. Joseph Hooker is at the present moment one of the most distinguished of European botanists. At a comparatively early age he has gained, and justly, a reputation that, great as it now is, grows daily. The author of the 'Flora Antarctica,' one of the most valuable contributions to systematic and geographical botany ever published, has gathered new laurels within the tropics, and has proved himself, if more proof were necessary, as worthy as ever of the distinguished name he inherits from his illustrious father." Edward Forbes also, in his address as president of the Geological Society, made the following further allusion: "Every student of Indian geology will be delighted at the appearance of the Himalayan Journals of Dr. Joseph Hooker, a work that will do much to sustain the reputation of the British School of Natural History. The geologist will find in it a rich store of facts of the highest interest, and for the inquirer into glacial phenomena it abounds with new and valuable data."

If still further testimony were wanted to the high merits of Dr. Hooker as a naturalist, it will be found in a letter of date 11th December, 1850, addressed by Baron Humboldt to Sir William J. Hooker, and published in the "Journal of Botany." "Six days ago," wrote that illustrious *savant*, "I received an admirable letter from your son, containing a perfect treasure of important observations relating to the mountain masses of Himalaya, their geology, meteorology, and botanical geography. What a noble traveller is Joseph Hooker! What an extent of acquired knowledge does he bring to bear on the observations he makes, and how marked with sagacity and moderation are the views that he puts forward! I can neither part with such a remarkable letter, nor keep to myself the *resumé* which it contains of his researches in Thibet and on its confines, therefore I desire that it should be published, and correctly published, in England. . . . I feel no little pride in being known to enjoy the friendship and correspondence of your son. When he returns to us in spring, he will find his own fame widely diffused and solidly based."

We should have mentioned before that Dr. Hooker lectured from the Botanical Chair in the University of Edinburgh, in 1845, for Professor Graham, and that on the death of that gentleman he became a candidate for the vacant chair. After a severe contest, his opponent,

Dr. J. H. Balfour, secured the appointment. In 1846 Dr. Hooker was appointed Botanist to the Geological Survey; and in this capacity he contributed a valuable paper to the Memoirs of the Survey, entitled, "On the Vegetation of the Carboniferous Period as Compared with that of the Present Day." This paper deserves the careful study of all fossil botanists, and will be found in the second volume of the "Memoirs."

In this sketch the interesting circumstance deserves to be noted that, after his return from his eastern travels, Dr. Hooker married the eldest daughter of the Rev. J. Stevens Henslow, Professor of Botany at Cambridge.

The materials at the command of Dr. Hooker for a work on the botany of India are very large. In conjunction with his friend Dr. Thomas Thomson, such a work was indeed undertaken, and under the title of "Flora Indica," one volume has been published. The intention of the authors to continue the work was at the time notified, the one in the Hookerian Herbarium at Kew, the other at the Calcutta Botanic Gardens; but so great is the expense attendant on the production of such a work that it will be almost impossible to proceed with it, unless under Government patronage and encouragement.

On scientific errands repeated visits have been made to the Continent by Dr. Hooker. In the autumn of 1860 he took a short tour in Syria, in company with Mr. Hanbury, F.L.S., during which he paid especial attention to the oaks of that country, in the hope of being able to throw some light on their very intricate and confused history. The result of the investigation was given to the Linnæan Society, on 20th June, 1861, in a paper on "The Three Oaks of Palestine." In compliance with the wishes of several distinguished Arctic voyagers, Dr. Hooker drew up an account of the affinities and distribution of the flowering plants of the north-polar regions, which was also communicated to the Linnæan Society. The contributions of our naturalist to the transactions of that body from time to time have been numerous and valuable. We may name the papers by him entitled, "On the Plants of the Galapagos Archipelago," "On the Structure and Affinities of *Balanophora*," and "Illustrations of the Floras of the Malayan Archipelago and Tropical Africa." Dr. Hooker has also contributed largely to the "Journal of Botany," edited by his late father, and is the author of the article "Himalaya," in the "Encyclopædia Britannica." It is, however, impossible to enumerate all his various literary and other labours in the prosecution of natural science. As an authority, he is frequently referred to, and, as a trustworthy observer, widely quoted by other writers.

Connected with some of the first scientific societies, and constantly consulted about their administration, a juror at exhibitions, and examiner to the Apothecaries' Company, London University, and Army Medical Service, Dr. Hooker, as Director of Kew Gardens, has also to conduct a correspondence with all the public offices, with India and the colonies, on botanical and horticultural subjects, besides being answerable for the condition and management of the gardens.

His is a public position of much labour as well as of much honour. But we may safely assume that, guided by the example of his illustrious and lamented father, and with his own experience, unwearied industry, and large scientific acquisitions, neither the public interests nor the gardens at Kew will suffer in the hands of the present Director. Nor can we conceive that the British Association, in raising to the honourable post

of its president Dr. Joseph Hooker, "the eminent son of an eminent sire," shall have any cause to regret the selection which it has made.

YARMOUTH BLOATERS.

We can trace back the history of the Yarmouth herring fishery to a date anterior to that of the Norman Conquest—there being records in existence to show that this fishery, among others, was subjected to legal supervision and regulation in the days of Edward the Confessor. A few centuries later the care of the clergy for the fishermen is evidenced by the fact that Herbert Bishop of Norwich, in the reign of William Rufus, built a church in the town of Yarmouth for their accommodation. In those old Catholic times fish was a general desideratum on fast-days, and the herring fishery flourished in consequence of the universal demand. By the time of Henry III., about the beginning of the thirteenth century, the Yarmouth herring fishery was known as the "worthiest in Europe." But though we may trace the herring as an article of food to a very remote antiquity, we cannot do the same with the bloater, nor does it at all appear when bloaters first began to be eaten, or who it was that first invested the herring with those sapid and savoury qualities which make the bloater, when eaten in perfection, so delicious. We have heard enthusiastic eaters declare that the bloater is an invention beyond the reach of art, and that its discovery must have been due to some fortunate accident, as in the case of Lundy Foot's snuff or Charles Lamb's roast pig!

But before eating your bloater you must catch your herring, or somebody must catch it for you; so, with the reader's permission, we will go on a short fishing trip. It is a mild evening in the middle of September, after a day of fair weather, with a steady gentle breeze blowing from the north. The lugger which awaits us lies, with a crowd of others, a little way out; and, jumping into a boat, we are not many minutes in getting alongside and boarding her. Then it is up anchor, trim sails, and off we go towards the deep sea. We have some dozen men on board, several of whom are not sailors by profession, or fishermen either, save during the herring season; but all are active handy lads and well versed in the business that has to be got through. Looking around us, we see a whole fleet of fishing vessels bound on the same expedition as ourselves, some already far out to sea, others following in our wake, and others again just about to start. The low sunlight gleams on their rusty sails, transforming them into sheets of flame, while their fitful reflections flash in broken splendour from the restless billows. But ere long the sun dips behind the dull land-level—the crowd of sails sink out of sight in the shadows of the gloaming, the surface of the sea grows black and dark, and the wild talk of the waves waxes louder as we get farther out into the open, and the breeze freshens.

So long as there is any daylight nobody thinks of shooting the nets, experience having proved that night is the fisherman's best opportunity; but darkness has no sooner set in than preparations are made for getting the nets overboard. Herrings are caught by means of nets suspended from the surface to the depth of some thirty feet, and having meshes not less than an inch in diameter. The nets are fifty yards long each, and ten or twelve in depth; and the object being to make a wall of net in the water of as great a length as possible to intercept the fish in their progress, the nets are joined

together as they are shot, and being weighted at bottom and buoyed at the top, present one unbroken barrier for the whole of their united length, which is often a mile or more. The mesh is large enough to admit the head of an average herring, but not the body; thus fish of a small size get through and escape, while the full-grown ones are detained by the net catching in the gill. Much alacrity is shown in getting the nets into the water as soon as all is ready, and the motion of the vessel has been sufficiently retarded by taking in sail—the men paying them out with striking rapidity, while the slow track of the lugger is marked by the floating buoys designating the position of the sunken snare.

Now follows a period of leisure, and if you choose you may wrap yourself in a boat-cloak and go to sleep for an hour or two, as many of the hands are doing. The skipper, you may note, is wide awake; he is in fact on the look-out for indications of fish, the presence or the absence of which his practised eye is skilful in detecting. By-and-by he signals one or two of the hands, who, at his direction, haul up a small portion of the net, by the appearance of which he is able to judge whether he has made a fortunate cast or the reverse. If, after an hour's waiting, the net came up blank, he would probably haul the whole in again and proceed to another ground. But such is not the case now—those silvery sparkles that shone out of the dark water were a suggestive sign of what is going on below, and he is well content to await the event.

There is a faint glimmer of dawn in the east when the hauling in begins, and soon all hands are busily engaged in the work, and are moreover in high spirits at the sight of the "take," which is far beyond their expectations. Some parts of the net come up like a shimmering sheet of silver, being so crowded with fish that it seems a wonder they were not rent asunder. In other portions there are comparatively few, and in one place the net has been torn by the dog-fish, and numbers of the herrings mangled and destroyed. Such damage is too common to excite much remark, fisher Jack being little given to comments merely verbal, and contenting himself by knocking Mr. Dog-fish on the head whenever he can catch him. Hauling in a full "take," if an interesting process, is rather a slow one: every fish has to be extricated from the net as it comes over the side, and as fast as they come they are deposited in the "swills" with a plentiful sprinkling of salt, and stowed away below or on deck. It is broad daylight long before the whole of the nets are on board, and now, crowding as much sail as we can, we run for Yarmouth sands by the nearest track.

Arrived at Yarmouth, the herrings are taken on shore without loss of time, and if they are not already the property of some contractor or fish-curer, are submitted at once to public auction, the sale taking place either on the open sands or at some well-known sale-room. At the beginning of the season prices will run high, and a good proportion of the catch will be bought by the local dealers and hawkers, who will retail them for consumption while they are yet fresh. Also a certain proportion will be salted or pickled as white herrings—the cheapest form in which herrings find their way to the market. But the herring for which Yarmouth has been famous almost from time immemorial, is the "red," or smoked herring, an article known and appreciated throughout the whole civilised world, but only known in perfection by those who have eaten the Yarmouth bloater in its best condition—for as surely as "the child is father of the man," the original red herring was the father of the unrivalled bloater. Let us see how the "reds" are