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978-1-108-00462-6 - The Travels and Researches of Alexander von Humboldt

William MacGillivray

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THE
TRAVELS AND RESEARCHES
OF
BARON HUMBOLDT.

CHAPTER I.

Introduction.

Birth and Education of Humboldt—His early Occupations—He resolves to visit Africa—Is disappointed in his Views, and goes to Madrid, where he is introduced to the King, and obtains Permission to visit the Spanish Colonies—Observations made on the Journey through Spain—Geological Constitution of the Country between Madrid and Corunna—Climate—Ancient Submersion of the Shores of the Mediterranean—Reception at Corunna, and Preparations for the Voyage to South America.

WITH the name of Humboldt we associate all that is interesting in the physical sciences. No traveller who has visited remote regions of the globe, for the purpose of observing the varied phenomena of nature, has added so much to our stock of positive knowledge. While the navigator has explored the coasts of unknown lands, discovered islands and shores, marked the depths of the sea, estimated the force of currents, and noted the more obvious traits in the aspect of the countries at which he has touched ; while the zoologist has investigated the multi-

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plied forms of animal life, the botanist the diversified vegetation, the geologist the structure and relations of the rocky masses of which the exterior of the earth is composed ; and while each has thus contributed to the illustration of the wonderful constitution of our planet, the distinguished traveller whose discoveries form the subject of this volume stands alone as uniting in himself a knowledge of all these sciences. Geography, meteorology, magnetism, the distribution of heat, the various departments of natural history, together with the affinities of races and languages, the history of nations, the political constitution of countries, statistics, commerce, and agriculture,—all have received accumulated and valuable additions from the exercise of his rare talents. The narrative of no traveller therefore could be more interesting to the man of varied information. But as from a work like that of which the present volume constitutes a part subjects strictly scientific must be excluded, unless when they can be treated in a manner intelligible to the public at large, it may here be stated, that many of the investigations of which we present the results, must be traced in the voluminous works which the author himself has published. At the same time enough will be given to gratify the scientific reader ; and while the narrative of personal adventure, the diversified phenomena of the physical world, the condition of societies, and the numerous other subjects discussed, will afford amusement and instruction, let it be remembered that truths faithfully extracted from the book of nature are alone calculated to enlarge the sphere of mental vision ; and that, while fanciful description is more apt to mislead than to direct

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BIRTH AND EDUCATION OF HUMBOLDT. 19

the footsteps of the student, there is reflected from the actual examination of the material universe a light which never fails to conduct the mind at once to sure knowledge and to pious sentiment.

Frederick Henry Alexander Von Humboldt was born at Berlin on the 14th of September 1769. He received his academic education at Göttingen and Frankfort on the Oder. In 1790 he visited Holland and England in company with Messrs George Forster and Van Geuns, and in the same year published his first work, entitled "Observations on the Basalts of the Rhine." In 1791 he went to Freyberg to receive the instructions of the celebrated Werner, the founder of geological science. The results of some of his observations in the mines of that district were published in 1793, under the title of *Specimen Floræ Friburgensis Subterraneæ*.

Having been appointed assessor of the Council of Mines at Berlin in 1792, and afterwards director-general of the mines of the principalities of Baireuth and Anspach in Franconia, he directed his efforts to the formation of public establishments in these districts; but in 1795 he resigned his office with the view of travelling, and visited part of Italy. His active and comprehensive mind engaged in the study of all the physical sciences; but the discoveries of Galvani seem at this period to have more particularly attracted his attention. The results of his experiments on animal electricity were published in 1796, with notes by Professor Blumenbach. In 1795 he had gone to Vienna, where he remained some time, ardently engaged in the study of a fine collection of exotic plants in that city. He travelled through several cantons of Salzburg and Styria with the cele-

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brated Von Buch, but was prevented by the war which then raged in Italy from extending his journey to that country, whither he was anxious to proceed for the purpose of examining the volcanic districts of Naples and Sicily. Accompanied by his brother William Von Humboldt and Mr Fischer, he then visited Paris, where he formed an acquaintance with M. Aimé Bonpland, a pupil of the School of Medicine and Garden of Plants, who, afterwards becoming his associate in travel, has greatly distinguished himself by his numerous discoveries in botany.

Humboldt, from his earliest youth, had cherished an ardent desire to travel into distant regions little known to Europeans, and, having at the age of eighteen resolved to visit the New Continent, he prepared himself by examining some of the most interesting parts of Europe, that he might be enabled to compare the geological structure of these two portions of the globe, and acquire a practical acquaintance with the instruments best adapted for aiding him in his observations. Fortunate in possessing ample pecuniary resources, he did not experience the privations which have disconcerted the plans and retarded the progress of many eminent individuals; but, not the less subject to unforeseen vicissitudes, he had to undergo several disappointments that thwarted the schemes which, like all men of ardent mind, he had indulged himself in forming. Meeting with a person passionately fond of the fine arts, and anxious to visit Upper Egypt, he resolved to accompany him to that interesting country; but political events interfered and forced him to abandon the project. The knowledge of the monuments of the more ancient nations of the Old World, which he acquired at

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JOURNEY TO SPAIN.

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this period, was subsequently of great use to him in his researches in the New Continent. An expedition of discovery to the southern hemisphere, under the direction of Captain Baudin, then preparing in France, and with which MM. Michaux and Bonpland were to be associated as naturalists, held out to him the hope of gratifying his desire of exploring unknown regions. But the war which broke out in Germany and Italy compelled the government to withdraw the funds allotted to this enterprise. Becoming acquainted with a Swedish consul who happened to pass through Paris, with the view of embarking at Marseilles on a mission to Algiers, he resolved to embrace the opportunity thus offered of visiting Africa, in order to examine the lofty chain of mountains in the empire of Morocco, and ultimately to join the body of scientific men attached to the French army in Egypt. Accompanied by his friend Bonpland, he therefore betook himself to Marseilles, where he waited for two months the arrival of the frigate which was to convey the consul to his destination. At length, learning that this vessel had been injured by a storm, he resolved to pass the winter in Spain, in hopes of finding another the following spring.

On his way to Madrid, he determined the geographical position of several important parts, and ascertained the height of the central plain of Castile. In March 1799 he was presented at the court of Aranjuez, and graciously received by the king, to whom he explained the motives which induced him to undertake a voyage to the New Continent. Being seconded in his application by the representations of an enlightened minister, Don Mariano Luis de

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Urquijo, he to his great joy obtained leave to visit and explore, without impediment or restriction, all the Spanish territories in America. The impatience of the travellers to take advantage of the permission thus granted did not allow them to bestow much time upon preparations; and about the middle of May they left Madrid, crossed part of Old Castile, Leon, and Galicia, and betook themselves to Corunna, whence they were to sail for the island of Cuba.

According to the observations made by our travellers, the interior of Spain consists of an elevated tableland, formed of secondary deposits,—sandstone, gypsum, rock-salt, and Jura limestone. The climate of the Castiles is much colder than that of Toulon and Genoa, its mean temperature scarcely rising to 59° of Fahrenheit's thermometer. The central plain is surrounded by a low and narrow belt, in several parts of which the fan-palm, the date, the sugar-cane, the banana, and many plants common to Spain and the north of Africa vegetate, without suffering from the severity of the winter. In the space included between the parallels of thirty-six and forty degrees of north latitude the mean temperature ranges from 62·6° to 68·2° Fahrenheit, and by a concurrence of favourable circumstances this section has become the principal seat of industry and intellectual cultivation.

Ascending from the shores of the Mediterranean, towards the elevated plains of La Mancha and the Castiles, one imagines that he sees far inland, in the extended precipices, the ancient coast of the Peninsula; a circumstance which brings to mind the traditions of the Samothracians and certain historical testimonies, according to which the bursting of the waters

through the Dardanelles, while it enlarged the basin of the Mediterranean, overwhelmed the southern part of Europe. The high central plain just described would, it may be presumed, resist the effects of the inundation until the escape of the waters by the strait formed between the Pillars of Hercules had gradually lowered the level of the Mediterranean, and thereby once more laid bare Upper Egypt on the one hand, and on the other, the fertile valleys of Tarragon, Valentia, and Murcia.

From Astorga to Corunna the mountains gradually rise, the secondary strata disappear by degrees, and the transition rocks which succeed announce the proximity of primitive formations. Large mountains of graywacke and graywacke-slate present themselves. In the vicinity of the latter town are granitic summits which extend to Cape Ortegal, and which might seem, with those of Brittany and Cornwall, to have once formed a chain of mountains that has been broken up and submersed. This rock is characterized by large and beautiful crystals of felspar, and contains tin-ore, which is worked with much labour and little profit by the Galicians.

On arriving at Corunna, they found the port blockaded by the English, for the purpose of interrupting the communication between the mother-country and the American colonies. The principal secretary of state had recommended them to Don Rafael Clavigo, recently appointed director-general of the maritime posts, who neglected nothing that could render their residence agreeable, and advised them to embark on board the corvette Pizarro bound for Havannah and Mexico. Instructions were

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given for the safe disposal of the instruments, and the captain was ordered to stop at Teneriffe so long as should be found necessary to enable the travellers to visit the port of Orotava and ascend the Peak.

During the few days of their detention, they occupied themselves in preparing the plants which they had collected, and in making sundry observations. Crossing to Ferrol they made some interesting experiments on the temperature of the sea and the decrease of heat in the successive strata of the water. The thermometer on the bank and near it was from 54° to 55.9° , while in deep water it stood at 59° or 59.5° , the air being 55° . The fact that the proximity of a sand-bank is indicated by a rapid descent of the temperature of the sea at its surface, is of great importance for the safety of navigators; for, although the use of the thermometer ought not to supersede that of the lead, variations of temperature indicative of danger may be perceived by it long before the vessel reaches the shoal. A heavy swell from the north-west rendered it impossible to continue their experiments. It was produced by a storm at sea, and obliged the English vessels to retire from the coast,—a circumstance which induced our travellers speedily to embark their instruments and baggage, although they were prevented from sailing by a high westerly wind that continued for several days.

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DEPARTURE FROM CORUNNA.

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CHAPTER II.

Voyage from Corunna to Teneriffe.

Departure from Corunna—Currents of the Atlantic Ocean—Marine Animals—Falling Stars—Swallows—Canary Islands—Lancerota—Fucus vitifolius—Causes of the Green Colour of Plants—La Graciosa—Stratified Basalt alternating with Marl—Hyalite—Quartz Sand—Remarks on the Distance at which Mountains are visible at Sea, and the Causes by which it is modified—Landing at Teneriffe.

THE wind having come round to the north-east, the Pizarro set sail on the afternoon of the 5th of June 1799, and after working out of the narrow passage passed the Tower of Hercules, or lighthouse of Corunna, at half-past six. Towards evening the wind increased, and the sea ran high. They directed their course to the north-west, for the purpose of avoiding the English frigates which were cruising off the coast, and about nine spied the fire of a fishing-hut at Lisarga, which was the last object they beheld in the west of Europe. As they advanced, the light mingled itself with the stars which rose on the horizon. “Our eyes,” says Humboldt, “remained involuntarily fixed upon it. Such impressions do not fade from the memory of those who have undertaken long voyages at an age when the emotions of the heart are in full force. How many recollections are awakened in the imagination

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by a luminous point, which in the middle of a dark night, appearing at intervals above the agitated waves, marks the shore of one's native land!"

They were obliged to run under courses, and proceeded at the rate of ten knots, although the vessel was not a fast sailer. At six in the morning she rolled so much that the fore topgallant-mast was carried away. On the 7th they were in the latitude of Cape Finisterre, the group of granitic rocks on which, named the Sierra de Torinona, is visible at sea to the distance of 59 miles. On the 8th, at sunset, they discovered from the mast-head an English convoy; and to avoid them they altered their course during the night. On the 9th they began to feel the effect of the great current which flows from the Azores towards the Straits of Gibraltar and the Canaries. Its direction was at first east by south; but nearer the inlet it became due east, and its force was such as, between 37° and 30° lat., sometimes to carry the vessel, in twenty-four hours, from 21 to 30 miles eastward.

Between the tropics, especially from the coast of Senegal to the Caribbean Sea, there is a stream that always flows from east to west, and which is named the Equinoctial Current. Its mean rapidity may be estimated at ten or eleven miles in twenty-four hours. This movement of the waters, which is also observed in the Pacific Ocean, having a direction contrary to that of the earth's rotation, is supposed to be connected with the latter only in so far as it changes into trade-winds those aerial currents from the poles, which, in the lower regions of the atmosphere, carry the cold air of the high latitudes towards the equator; and it is to the general impulse