

Alexander von Humboldt

in Paris, where, better than in Berlin, he was able to obtain scientific co-operation in arranging for publication the great mass of data he had collected. This task, which he hoped to accomplish in two years, occupied more than twenty; and it is an evidence of his strength of character that he accomplished this without yielding to the desire for further travel, while Bonpland left his work incomplete to return to South America.

The first work that he published is perhaps the best known of all of Humboldt's books. It was entitled "*Views of Nature*," and was, to use his own words, "a series of papers which originated in the presence of the noblest objects of nature—on the ocean, in the forests of the Orinoco, in the savannahs of Venezuela, and in the solitudes of the Peruvian and Mexican mountains." Its object was "to heighten the enjoyment of nature by vivid representation, and at the same time to increase, according to the present state of science, the reader's insight into the harmonious co-operation of forces."

The purely scientific results of his travels he classified and published in separate volumes—two on astronomy and geography, two on zoology and comparative anatomy, two on the political economy of New Spain, one on the Cordilleras and monuments of the indigenous nations, seven of descriptive botany, one on plant geography, and one on geology; and then, as if this amazing activity, with its unprecedented contributions to almost every department of science, were not enough, he added, for the purpose of including such material as did not fall within the scope of these works, his "*Personal Narrative*," begun in 1815 and continued until 1831. The works already mentioned, together with some separate volumes of plates,

made a library of twenty-six folio and quarto volumes, which by 1844 were valued at over \$2,000. The books resulting from his travels in Asia are entitled "*Asiatic Fragments*" and "*Central Asia*," the former consisting of two and the latter of three volumes.

For many years Humboldt's chosen home was Paris, where he found, in far more generous measure than in Berlin, the congenial companionship and sympathy of fellow-workers in science. But Berlin was the home of his brother, his own native city, and there, too, was the king of Prussia, who had conceived a great liking for him and had determined to have him at hand as friend and scientific adviser. Yielding to his wishes, Humboldt, in 1826, took up his residence in Berlin, but much that he found there was not to his taste, and for a time he made frequent visits to Paris, where he could work better.

His later life at the Prussian court, where he was still retained by Frederick William IV., was one of indefatigable scientific work and involuntary discontent with the incongenial atmosphere by which he was surrounded. From his letters to his friend Varnhagen, to whom he opened his heart, we get a glimpse that prompts a suspicion that the king's jester may sometimes hold a more comfortable position than the king's scientist. His seat at the royal table, frequent journeys with the king, and the splendors of the court, made scanty amends for lack of intellectual sympathy. The two men were totally at variance both in politics and religion, and occasionally, in a half-desperate mood, Humboldt expressed himself in no measured terms regarding those with whom he had so little in common. He was no "king's gentleman," like Voltaire; the patronage was on both sides—an interchange of

the noblest mental powers and the highest social station—and Humboldt well knew the immeasurably greater worth of what he gave in the unequal compact.

But in spite of these hindrances his phenomenal intellectual activity and untiring scientific genius found continued and fruitful expression, now in a course of lectures that attracted scholars and the general public alike, now in a plan for a series of stations for magnetic and meteorological observations to encircle the globe, resulting in the actual establishment of such a chain of stations through Russia and northern Asia to the borders of China; in the midst of the distractions of the court sleeping but four or five hours out of the twenty-four, that he might give the more time to writing books; appointed to diplomatic missions requiring special knowledge and tact—in these and in many other ways for many years Humboldt served as no one else could his country and the cause of science. In the midst of these duties his life was saddened in 1836 by the loss of his brother William, between whom and himself there had always existed the most loving fraternal relations, and in whose death Humboldt lamented that he had lost half of himself.

Humboldt had reached the ripe age of seventy-six before he began to put into final form the great literary work of his life the "*Cosmos*." Before he was thirty he had outlined the work in a letter to a friend and his subsequent public lectures were really an epitome of it. In the introduction he says: "In the late evening of active life I offer to the German public a work whose undefined image has floated before my mind for almost half a century." The title of the book is its best description. After so many years of study and travel the author sought to

communicate to others in the supreme and final product of his genius the great thoughts of a lifetime. He had reached the point where he could "comprehend the phenomena of physical objects in their general connection, and represent nature as one great whole, moved and animated by physical forces;" and now he would cause this to pass before his readers as a panorama of the universe, lighted up by his own poetic spirit, but everywhere in conformity with the rigid scientific principles that it had been his mission to determine and elaborate. To this end he labored with unabated vigor until, in his ninetieth year, death ended his work. The last sheets were sent to the printer but two months before his death. The work is unique in its vast accumulation of scientific matter, in literary form, and the lucid expression that brings it within the intellectual range of ordinary minds.

The preceding sketch has presented Humboldt as an intrepid explorer, a universal scientist and author, and a trusted confidant in the diplomatic circles of two great empires; but to those who knew him best the man was more than the scientist, and the teacher's work has endured while that of the diplomat has passed away. Humboldt possessed a large humanity that made him the friend of the oppressed, an earnest advocate of political freedom, and a patron and helper of struggling students. Agassiz tells that when he was studying in Paris his funds gave out and he was about to return home. He told his instructor why he was leaving, and the instructor must have told Humboldt, for the next day his servant brought Agassiz an envelope containing a check for £50, with the request that he accept the money as a loan. Not many

loans have been more secure or brought greater interest in return.

It would be hard to overestimate his actual contributions to human knowledge. He discovered the increased intensity of the earth's magnetic force from the poles to the equator; he showed that volcanoes were arranged in lines and demonstrated the igneous origin of certain rocks; he recognized the physical factors determining the distribution of plants, and the existence of independent formations in the geological history of the earth, and drew the first isothermal and magnetic lines; and, finally, he practically created the sciences of physical geography and meteorology. But in its lasting results his work as a teacher overshadows that of the worker in science.

It is not those alone who meet students within the walls of a schoolroom or laboratory who are teachers. Humboldt never did this, but from the time that he bent his energies while inspector of mines to the establishment of a public school, to the last months of his life when in writing "*Cosmos*" he tried to bring the German people to see nature through his eyes, he showed the spirit and did the work of a teacher. He was eager to impart knowledge, and skillful in his methods of doing so.

For a short period of his life Humboldt came into direct contact with the public when he gave his courses of lectures in Paris and Berlin, which were eagerly listened to not only by scholars but by people of all ranks as well. His name became a household word, even among the unlearned and ignorant.

The whole German nation finally became pupils in Humboldt's school. When he was a young man Germany

had lost for the time the spirit of scientific thought, and had become a center of synthetic philosophy. Poets and philosophers controlled the popular mind, and Humboldt went to a foreign country to find scientific co-operation and sympathy. Later, however, he returned to fulfill the greater work to which he was called, and it would be hard to imagine one better fitted than he to change the current of the national thought. His profound and powerful intellect, his poetic and artistic temperament, his noble birth, and above all his capacity for exact scientific thought, made him beyond all others "the man to lay the bridge between the old and the new time, between the philological, æsthetic Germany, as the turn of the century saw it, and the scientific, technical and inductive Germany of our day." This he accomplished, and not Germany alone but the world has shared the fruits of his toil and genius, and gladly joins with his fatherland to do him honor.

ALEXANDER VON HUMBOLDT

SELECTED STUDIES AND REMINISCENCES

HUMBOLDT AND THE HAPPY FORTUNE OF HIS BIRTH

Our researches into the phenomena of the physical and the human cosmos present us with many curious parallels. In those two distinct, yet inseparably united realms, there are periods when the creative energies seem to slumber, and periods when they seem to manifest themselves in splendid and unwonted energy. Like the aloe, which, according to popular belief, flowers but once in a hundred years, then puts forth a blossom of marvelous beauty, so nature atones for her seeming sleep by the creation of minds which become new vital forces in the world of man. One star does not rise alone in the twilight of heaven: great men dawn upon the world in constellations. Sometimes a decade of years sees the advent of those who are to give character to the century in which they live. Sometimes a single year is marked in this way; and such was the year 1769. Between the chimes of its New Year's morn and the last setting of its December sun, were born into the world Cuvier, Wellington, Napoleon; Sir Thomas Lawrence, long the first portrait-painter of the age, and President of the Royal Academy; William

VIII. ALEXANDER VON HUMBOLDT

1769-1859

BIOGRAPHICAL STUDY

BY VOLNEY M. SPALDING, PH. D.
Professor of Botany, University of Michigan

Friedrich Heinrich Alexander, Baron von Humboldt, as his name stands in full, was born in Berlin in 1769. He was of noble parentage, his father having received the post of royal chamberlain as a reward for his services in the Seven Years' War. When he was ten years old his father died and the care of his education and that of his brother William devolved upon the mother.

As a child Alexander was frail and of little mental promise, and the two boys, instead of being sent to school, were taught at home by tutors. One of these was Campe, the editor of the German "*Robinson Crusoe*," and it is very possible that in his earliest years Alexander Humboldt imbibed at his teacher's knee a love of travel and adventure. Later the two boys were sent to school—first at Berlin, then at Frankfort, and finally at Göttingen. His brother followed the bent of the age, giving himself to literature and philosophy, while Alexander, under the

same influences, developed year by year a still stronger taste for natural phenomena. He was nineteen years old when he entered the University of Göttingen, and here he met and formed an intimate friendship with George Forster, one of Cook's companions on his second voyage.

This friendship was well calculated to heighten the desire for travel that now amounted to a passion with him. In one of his vacations, while still a mere boy in years, he made a scientific expedition up the Rhine, and published the results of his investigations in a paper entitled "*Mineralogical Observations on Some of the Basalts of the Rhine.*"

By this time his future lay clearly outlined in his powerful imagination. He was to be a scientific explorer, and from this purpose he never swerved, but bent every energy toward preparing himself for his chosen calling; and seldom have both nature and education combined to give greater fitness for such a career. He had a poetical, artistic temperament, an eye keenly alive to every impression, a rare power of language, and a sympathetic, kindly disposition. He studied with the best masters of the day, commerce, foreign languages, the use of scientific instruments, botany, chemistry, ethnology, and finally geology and palæontology at Freiberg, where he published a work on fossil plants that gained him the appointment of director-general of mines in the principalities of Anspruch and Bayreuth.

It was during this time that he became greatly interested in Galvani's discoveries in muscular irritability. He carried on an extended series of experiments while attending to his public duties, taking his instruments with him as he went from place to place on horseback, depopulating

frogponds at every stopping place, and finally in 1797 publishing the results of his investigations in two octavo volumes.

In the meantime he had formed the friendship of Goethe and Schiller, the one twenty and the other ten years his senior, but both of them gladly sharing their scientific and literary treasures with the young man whose life and teaching were to affect so fundamentally the intellectual life of Germany and the world. Schiller's previous medical studies gave him a sympathetic interest in Humboldt's experiments, and it may have been under the influence of this friendship that he wrote for Schiller's paper, "*The Rhodian Genius*," a physiological allegory which embodied his idea of the vital principle.

In 1796 Humboldt's mother died. Up to this time he had refrained for her sake from carrying out his ambition to travel in distant lands; but now there was nothing to prevent its realization, and after a preliminary trip into Italy and Sicily for the purpose of examining their volcanic regions he turned his thoughts toward the accomplishment of his cherished purpose.

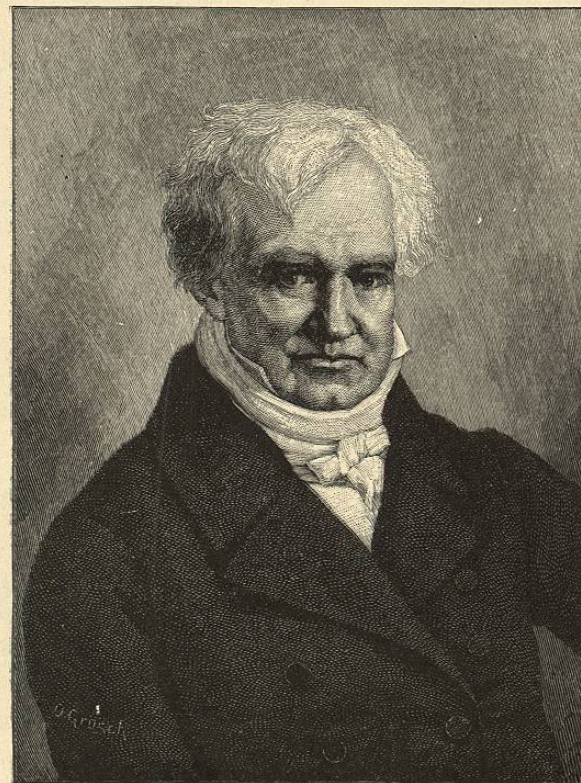
On the 15th of June, 1799, in company with the French botanist Aimé Bonpland, Humboldt sailed from Spain, armed with a permit from the government to visit and explore all the Spanish possessions in America. They landed at Cumana, in Venezuela, and after exploring the coast made a long journey inland, during which they discovered the connection between the water systems of the Amazon and Orinoco rivers. After this they spent several months in Cuba, then returned to Cartagena and made another inland journey over the mountains to Quito and Lima, whence they sailed to Mexico; and after a year

there and a short visit to the United States they sailed for Bordeaux, where they landed on August 3, 1804.

Their zeal in collecting everything illustrative of the natural history of the regions visited, and the difficulties encountered, may be understood in part from Humboldt's own account. He says: "Our progress was often retarded by dragging after us during expeditions of five or six months, twelve, fifteen and sometimes more than twenty loaded mules," with collections that toward the close of the expedition "formed forty-two boxes containing an herbal of 6,000 equinoctial plants, seeds, shells, insects, and, what had hitherto never been brought to Europe, geological specimens from the Chimborazo, New Granada, and the banks of the Amazon." At the same time he was devoting himself with extraordinary outlay of care and labor to the observation of every form of natural phenomena and the preservation of accurate scientific records.

Humboldt was thirty-five years of age when he returned from his American travels, and he was sixty before he undertook another journey of exploration. The second one was across central Asia, the expense being defrayed by the Russian government. He was accompanied by Gustav Rose and Ehrenberg, and in this journey of eight months and a half, extending over 25,000 miles, he collected a mass of observations that required years to reduce to their published form. He said that this expedition enlarged his views "of all that concerns the formation of the earth's surface." More specifically, it helped him, among other important results, to explain the differences of the American and Asiatic climates, and he also made important discoveries in regard to the mineral wealth of the country.

After Humboldt's return from America he settled down



ALEXANDER VON HUMBOLDT.
From a daguerreotype.