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Hon. Jared Sparks.

With the respects of the Author.

CARL RITTER;

An Address

TO THE

AMERICAN GEOGRAPHICAL AND STATISTICAL
SOCIETY,

BY

ARNOLD GUYOT,

*Professor of Physical Geography and Geology, College
of New Jersey.*



PRINCETON, N. J.:

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Carl Ritter : an address to the American



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(From the Journal of the Amer. Geograph. Society, Vol. II., No. I.)



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IV.—*Carl Ritter: An Address to the Society.* By Professor
ARNOLD HENRY GUYOT, LL.D., COR. MEM. A.G.S.S.

Delivered February 16, 1860.

Gentlemen of the American Geographical Society:

Less than a year has elapsed since we assembled in this place to express our sorrow at the death of Humboldt, and to pay a just tribute of honor to his glorious memory, as to one who, for half a century, stood before the world as the embodiment and fit representative of all modern progress in the knowledge of the Physical Globe; and here we come to-day, once more to mourn the loss of another great Master in our beloved science,—I might say the other great Master in the Science of the Globe,—Carl Ritter, the world-renowned author of the classical "*Erdkunde*," or *the Science of the Globe in its relations to nature and to the history of mankind*.

Humboldt, who first entered the scene of life and of his labors, first also left it on the 6th of May, 1859, at the advanced age of 90 years; and before another season was over, on the 28th of September last, soon after the close of his 80th year, Ritter followed him into a better world.

The two high-priests of the temple of Nature and of History have thus received the last summons from on high. When called, both were found still actively engaged in their high functions. They have obeyed the call; they are gone; but the temple that they have reared and beautified, and the Mighty One to whom it is consecrated, subsist, and both will last forever.

It is not in death alone that they are thus associated. Sons of the same mother country, living to the last in the same city,—in the city of Berlin, that great metropolis of German science,—united by ties of affection and by feelings of a deep mutual esteem and regard, they still live united in the memory of men.

For the last forty years the names of Humboldt and Ritter, constantly associated, have been household words with every one interested in Geographical studies. With them is connected, in the minds of all, the idea of a gigantic progress in the science of the globe,—a progress due not only to the addition of new facts, but, as is especially the case with Ritter's name, to a new dignity conferred upon that science by a more philosophical method, by the elevated stand-point from which it is viewed and treated, and by the living, harmo-

nious connection that has been established between it and the sister sciences. To these great minds also is traced, as to its main source, that reform movement which has impressed its stamp upon all the geographical literature of the day in Germany, has penetrated into every school, and the mighty flood of which, flowing over its primitive boundaries, has covered Scandinavia, Switzerland, now reaches England, and, I am happy to say, is making rapid progress in this country.

A conviction so universal, so deeply rooted in the popular consciousness, especially in that of the German nation, which reared them and received their immediate teachings, of that people endowed with so keen a power of appreciation of all kinds of scientific merit, can but correspond to a reality. That great progress cannot be denied. It is evident to the eye of every one who has had an opportunity of comparing the condition of geographical knowledge at the present day with that of half a century ago ; that is, before and after the period of the activity and controlling influence of Humboldt and of Ritter. But what seems less evident, less distinctly established in the minds of many, is the character of the peculiar element of progress contributed to geographical science by each of these two great Reformers.

The brilliant services, so recently discussed before you, rendered to the science of Terrestrial Physics by Humboldt the geographer and geologist, by Humboldt the physicist and meteorologist, by Humboldt the botanist and zoologist, by Humboldt the scientific discoverer of the New World and the experienced scientific traveller in Central Asia, by Humboldt the author of the *Cosmos*, are present to the minds of all. The physics of the Globe, that noble science, last born, but not least, among her sister sciences, owes him, as I have said elsewhere, its present shape and its best results. This remains his chief, his most glorious title to the gratitude of the scientific, and his labors mark the beginning of a new era, from which the knowledge of our physical globe, as a grand harmonious whole, will have to date its future steps in the career of progress.

How warmly Ritter acknowledged the high merit and admired the researches of Humboldt, how fully he appreciated their value, and joyfully hailed every new result obtained by his ingenuity, appears, among others, in a page of the Introduction to his great book, the "*Erdkunde*," especially devoted to Humboldt's labors, and in which he declares that without such a foundation as that furnished by the works of

Humboldt, his own work would have been impossible. But that very declaration shows that the work that he himself conceived and virtually performed, was still another than that attempted by Humboldt. For him the full knowledge of the physical globe, grand as it is in itself, is but a means, not an end. Our planet is a living organization which comprises the life of mankind. The central idea of the "*Erdkunde*," therefore, the inward principle upon which it rests, the principle of order which binds together all its parts, is that of a vital union of nature and of man into an organic unity. Its main task is the study of the unceasing, ever-renewed, and varied mutual action of these two factors. That idea must be clearly apprehended and well defined; it must be seized in its fruitful applications, in its rich consequences, before one can justly appreciate its full value, and understand the profound revolution that it has effected. Such a true appreciation alone will account for the vast influence that Ritter exerted upon his age, and for the fact that all thinking Germany dates, from the appearance of the "*Erdkunde*," the emancipation of Geography as an independent science, in the high sense of the term, possessed since of a principle of its own, and which takes its rank side by side with its sister science, the Philosophy of History.

You will agree with me, gentlemen, when I say that, great and well deserved as is Ritter's reputation in this country, it is—as all great reputations, indeed, but perhaps more so than usual—one resting upon authority. It is, if I may be allowed the expression, an imported one; and this, indeed, is not surprising; and we could scarcely speak otherwise of England, and still more of France. Ritter's theoretical ideas and methods are to be taken from a few academic memoirs, but more especially from his great work itself. There we find them realized in the rich, concrete forms of life. They never have been reduced by him into a regular abstract system or doctrine, a form altogether uncongenial to a mind which was so thoroughly filled with the vivid images of nature. These channels, together with his suggestive lectures to thousands of students during the long period of his public teaching, were sufficient to spread his spirit in Germany. But they are not so for foreign countries. The original memoirs just mentioned, though since published separately, are not of easy access. The very bulk of his main work has prevented, thus far, a translation of it into foreign languages, except, strange to say, one into the Russian, and a very partial one into the French.

How many, in this busy world of America, will attempt the careful reading of the nineteen volumes, the twenty thousand pages of close text, which compose the portion of the "*Erdkunde*" now published; and that, too, in that rich, beautiful, but by no means easy tongue of Germany. These, I confess, are real obstacles much to be regretted, but which ought to be overcome, and ought not to be allowed to cut us off from the abundant stores of knowledge accumulated by that great scholar.

You have honored me, gentlemen, with a request to address you upon this occasion on the life and the works of Carl Ritter. I thank you for this privilege, for such I feel it to be. I responded to the call, however, with no small degree of diffidence. But aroused in my University days, by the teachings of that venerable and much beloved friend, to the study of his favorite science, which soon became mine; guided in further steps by his kind, affectionate, and ever-ready advice; cheered on at every stage of my scientific career by his deep sympathy, and the spontaneous expression of an unqualified approval—the last of which, traced a few days before the cold hand of death took the pen from his hand, has for me the solemn significance of his scientific will;—loaded with such favors on his part, I felt that no personal consideration could justify me in declining the opportunity thus offered publicly to express the feelings of deep gratitude, and almost filial affection, which bind me to that great man, and at least to attempt to do justice before you to his claim to the gratitude of cultivated mankind. The task, however, as the nature of the subject may soon prove to you, is not an easy one, and it is in all sincerity, and more for his memory than for myself, that I must beg your indulgence for my willing, but perhaps inadequate, efforts.

The life of Ritter offers no great or stirring events. It is modest and serene, like himself. But it derives a peculiar interest from the circumstances by which a watchful Providence afforded, contrary to human expectation, the means best appropriate to a full development of the faculties with which he was endowed, and from his readiness eagerly and faithfully to improve every opportunity thus offered to him.

Carl Ritter was born on the 7th of August, 1779, in the city of Quedlinburg, the birthplace of the great poet, Klopstock, in the mountainous region of the Harz, in Prussian Saxony. He thus belongs, by the first twenty years of his life, so decisive for the character of every man in after life, to

the end of the eighteenth century, that remarkable era which can be called emphatically the mother of the present age.

There are, indeed, in the life of mankind, as in all that lives, critical times, in which it seems as if the fountains of life are stirred up to their very depths, and in which the forces of life are aroused to bring forth new productions more abundant and more beautiful. Such a stirring age was the end of the eighteenth century. It severs itself from the traditions of the past, which fetter instead of fostering human progress. It returns to the depth of human consciousness, in order to place itself on a basis at once more true and more solid. It turns its eyes, with the most sanguine hopes, towards an unknown future. A noble, sincere enthusiasm, ready for all sacrifices, seizes upon every soul, and imparts to the whole movement a dignity which its worst excess can mar, but not efface. It is truly a time of youthful renovation of the elements of human civilization, a creative age to which we may trace the beginning of all the progress of which our age can boast.

In every direction a host of noble pioneers strike new paths in the old, desolate fields, as well as in the new, untrodden ones, with the hopeful daring and vigor of youth, unaware of coming dangers, unmindful of difficulties. The French and American Revolutions in social science, Kant in philosophy, Schiller and Goethe in literature, Lavoisier in chemistry, Volta, Oerstedt in physics, Herschell in astronomy, Werner and Von Buch in geology, Humboldt in terrestrial physics, De Jussieu and De Candolle in botany, Cuvier in zoology, Ritter, at last, in geography, all begin, in each of these grand departments of human culture, a new era, the era in which we live; and it is on the foundation laid down by these glorious sons of the great movement of the eighteenth century, that we rear the splendid edifice which is the glory of the nineteenth.

The birth of Ritter, in such a time and such an atmosphere, can fitly be termed, in view of his future calling, a providential event.

Ritter's father was a physician, much esteemed for his skill and the noble qualities of his mind and heart. He died young, and Ritter's mother, a highly educated woman, remained a widow with five children, without any means to educate them. But help soon came, as providential help always does, from the quarter from which it could least be expected. The Prince of Bernburg took charge of the eldest son, ten years old. A distinguished, enthusiastic educator, Salzman, previously unacquainted with the family, requested

the mother to intrust to him her young Carl, then five years old ; and Carl became the first pupil of the just opened and since celebrated school at Schnepfenthal, near Gotha, in Saxony, which still glories in having reared that great scholar. Under the enlightened guidance and loving care of Salzmann and his associate, the noble-hearted GutsMuths, the former family instructor of Dr. Ritter's children, and a system of education, the object of which was to develop and invigorate the body as well as the mind and heart, the child grew to a happy, amiable, pure-minded young man. In that lovely valley, which Ritter always considered as his true home, at the foot of the Thuringian forest, far from the artificial life of cities, but surrounded by a charming and most varied scenery, he formed, at an early age, that intimate acquaintance with nature, and imbibed that love for the beauties of God's creation, which breathes in all his works. At the age of seventeen, when the question of his immediate future began to become an earnest one, Providence again provided for him. A rich merchant from Frankfort-on-the-Main, Mr. Hollweg, a partner in the large firm of Bethman, visited the school, and became so much interested in the young Ritter that he offered to send him for two years to the University, on condition that he would, after that time, take charge, in his own house, of the instruction of his children. The offer was accepted, and Ritter became, in November, 1796, a student at the University of Halle.

In 1798, he entered upon his duties in Mr. Hollweg's house in Frankfort, and with his characteristic, upright earnestness, devoted to the work before him his best energies. The most signal success crowned his efforts, and the strong ties of mutual affection which were formed between him and his pupils and lasted to the day of his death, a just and sweet reward for his devotion, honor both the pupils and the instructor. Of the two sons of Mr. Hollweg the elder died in his youth ; the other, a worthy pupil of such a teacher, is now the Minister of Public Instruction and Worship in Prussia, the noble-minded Von Bethman-Hollweg, the representative, in this high and influential position, of the liberal and enlightened tendencies of our age. In the education of a third pupil, the son of the celebrated S. Th. Soemmering, he met with equal success.

The situation of Ritter in Frankfort, and his connection with that wealthy and highly cultivated family, had a great influence on his life and his general development. Opportunities for improvement, rarely enjoyed to an equal degree by one placed in his early circumstances, opportu-

nities eagerly embraced by his ready and conscientious mind, were now offered to him. The qualities of his mind and heart had soon won for him in the family the position of an esteemed and affectionate friend. As such, and as an inmate of the house, he came in contact with the most refined society, and many of the most distinguished men of the age, who repaired to the house of Hollweg as to a common centre. Here was begun his acquaintance with such men as Humboldt, as the great geologist, Leopold von Buch, with the suggestive, truly philosophical S. Th. Soemmering, to whom he modestly refers, in the Introduction to the "*Erdkunde*," the merit of having especially called his attention to the laws of the geographical relationship of all animated nature. In Frankfort, also, he formed an intimate friendship with Ebel, the genial author of "*The Structure of the Earth in the Alps*" and other works on Switzerland, from whom he received a fresh impulse to the study of the Globe. Meanwhile, urged on by his duties towards his pupils, he embraced in his activity the most varied studies. History and the ancient languages received from him a particular attention. He read with his friends, the eminent philologists, Matthiæ and Grotefend, the prominent authors of Greece and Rome. He thus diligently accumulated from all quarters, the treasures of that vast erudition without which his future work would have been impossible.

His predilection for Geography, however, becomes already apparent by the publication, in 1806, of six charts of Europe, followed afterwards, in 1811, by a Geography of Europe in two volumes. In these works the author of the "*Erdkunde*" is predicted, but not yet fully manifested. One element is to be added to his previous preparation, and this is a more direct acquaintance with the grand typical forms of nature and with the marvellous products of human culture. Ritter must see Switzerland and Italy—contemplate the wonders of nature and history in their very sanctuaries. That precious gift also was in store for him. From the year 1807, he repeatedly visited, with his pupils, Switzerland and Italy. The last journey, which commenced in 1811, extended over several years, and allowed him a sojourn of over a year in Geneva, and a prolonged stay at Rome and in Italy, which he visited to its southern extremity.

What a rich source of instruction these travels have been for a mind so eager to drink from the very fountains of knowledge, and so well prepared and matured by assiduous study

and labor, may be easily conceived. Switzerland and the gigantic fabric of the Alps, which he visited again and again until a few years before his death, furnished to his plastic and vivid imagination the most accomplished type of mountain scenery, with which to compare all the other grand systems of our Globe. The careful study of Italy and Rome, that classical soil of history and of art, clothed with the truthfulness of life his conceptions of the past ages, and gave him a deep intuition of the adaptedness of the beautiful climate, of the admirable nature, and the remarkable structure of the peninsular lands which surround the Mediterranean Sea for developing the brilliant flower of the civilization of the ancient world. Without these rich intuitions derived directly from Nature, says Ritter himself in the Introduction to his "*Erdkunde*," his work would not have been undertaken, as without Humboldt's labors, it could not have been performed. This remark clearly tells the high value that he attached to these personal experiences.

In every country that he visited he formed an intimate acquaintance with the leading minds of the time. During his protracted stay in Geneva, that scientific metropolis of Switzerland, he enjoyed familiar intercourse with the most eminent men of that school. De Saussure, the model scientific traveler and physicist of European fame, had just died, but A. Pictet, De Candolle, and many others remained. The intimate and fruitful friendship which soon united him to the first, no doubt contributed, together with the natural beauties of that privileged country, to cause Ritter to look upon his sojourn in Geneva as a bright spot in his life.

But of all men with whom Ritter met at this period of his life, none seems to have made a deeper, a more lasting impression upon him than Pestalozzi, the far-famed reformer of popular education. Ritter went to visit him for a few hours in 1807, in Yverdon, at that time the place of his residence, and remained there for months. Pestalozzi's sympathetic nature found in Ritter's soul a full response. Ritter's letters to him, copies of some of which happen to be in my possession, are full of expressions of gratitude and of the tender regard of a son for a respected and beloved father, and of admiration for the fundamental idea on which rests his method of teaching. His life-size portrait stood in Ritter's library. To him and to Gutsmuths, his fatherly teachers, as he calls them, and not to some high patron, he inscribes the first volume of his *General Geography*, as a token of his reverence and heartfelt gratitude.

In Rome he met with that triad of pure-minded artists, Thorwaldsen, Overbeck, and Cornelius, whose genius raised German art so high, and whose friendly intercourse gave him an enlarged view of art and a deeper insight into its nature. By the careful study of the topography of that most remarkable of all historical spots and its monuments, Ritter gathered copious materials for one of his most popular courses of lectures at the University of Berlin.

The period of preparation is now over for Ritter. Eighteen years have elapsed since the close of his first education in Schnepfenthal ; eighteen years of assiduous labor in nearly all the domains of human knowledge, and of large experience in the world of nature and of man. He returns home, loaded with these new treasures, with matured views, and a clear perception of the grand idea, which he so gradually evolved from the depth of his rich nature, and which is to establish the science of the globe on a new foundation and breathe into it a new spirit.

But it is not enough for that great architect to have conceived and matured the plan, to have collected the materials for the edifice ; he must rear it, realize his conception, and give it the tangible form of life. He soon sets himself at work and devotes all his energies to the performance of that arduous task that he now feels to be the work of his life. In the year 1814, he went to Göttingen with his two pupils now ripe for University studies. During two years he devoted his new leisure to a faithful use of that vast University library of Göttingen, then, perhaps, the richest among the rich ones which are gathered in so great numbers in Germany, on that classical soil of learning. Like Humboldt, a few years later, Ritter, then, could have been seen, a man of ripe years and known already by his vast acquirements, modestly sitting among the crowd of young students, listening to courses of lectures delivered at the University on topics most varied. Here also, as elsewhere, he soon gained the esteem of those who represented the intellectual progress of the day in that old centre of learning ; and he enjoyed the benefit of private intercourse with most men of literary and scientific eminence at that time attached to the University. Among the last, particular mention must be made of the celebrated geologist Hausmann, with whom he remained united to the end of his days by the bonds of an intimate friendship, and who himself died a few weeks since, in December, 1859, but a few months after the departure of his old friend.

In 1816, Ritter went to Berlin, where he remained one year, busily engaged in finishing and putting to press the first edition of his General Geography, the first volume of which was published in that city by Reimer, in 1817, under the title of *Die Erdkunde im Verhältniss zur Natur und zur Geschichte des Menschen, oder Allgemeine Vergleichende Geographie, als sichere Grundlage des Studium und Unterrichts in physikalischen und historischen Wissenschaften*; "The Science of the Earth in its relation to Nature and to the History of Man, or General Comparative Geography as a safe foundation for studying and teaching Physical and Historical Sciences." In the spring of 1817, he returned to Göttingen, where he terminated the second volume of the work, which appeared in 1818.

These two volumes comprised only the continents of Africa and Asia, three Books out of twelve, which were to complete the whole work. But they revealed Ritter to the world, and were sufficient to place him in the high scientific position that he has since so successfully sustained, and so usefully occupied. In a masterly Introduction, he unfolds the views which he has so gradually matured, and which are to regenerate geography and to elevate it to the rank of the science of the Globe considered as a living organism. In the work itself, he practically illustrates the method, at once comparative and natural, or objective, as he terms it, which is commended by the lofty stand-point at which he places himself, and from which embracing the totality of his subject, he tries to master all its details, to grasp their beautiful arrangement, and to reproduce it in a truthful picture before the eyes of the reader.

But I beg your permission to leave for a moment all further considerations of that work, the merit and scientific influence of which I shall have soon to discuss, and to say a few more words on Ritter's life and activity subsequent to that important step in his career.

Ritter's merit was soon appreciated. The year which followed the publication of the second volume of the "Erdkunde" he received a call as Professor of History in the Gymnasium at Frankfort, which he accepted. In the autumn of the same year he was married, at the age of forty, to the accomplished woman who, for so many years, was the faithful and much beloved companion of his life.

In 1820, another call, the most honorable that he could receive, brought him to Berlin as Professor of Geography both at the Royal Military School and at the University, where that

chair, the first, it is believed, devoted to that special branch of knowledge in any German University, was created for him ; a public acknowledgment both of Ritter's merit and of the scientific character that had been imparted to Geography by his labors. This appointment was due to the enlightened and far-seeing Minister of Public Instruction, William von Humboldt, the highly gifted brother of Alexander, and to his successor, Von Altenstein, and reflects no little credit on the wisdom of these distinguished men, to the liberal and discriminating patronage of whom the cause of learning in Prussia is otherwise so much indebted.

Ritter has now found the appropriate scene of action and of further progress ; the field prepared for him by Providence, as he often gratefully acknowledged, for doing the work to which he felt called. Here, in the largest of the Universities of Germany, surrounded by a crowd of young men eager for knowledge and ready for every new light, for every new advance, he met with a most welcome opportunity for an application on a grand scale of the plenteous stores of learning and of scientific experience which he had been so long accumulating. To impart to minds thus prepared the new truths that he possessed, was to him not only a duty, but a delight. Moreover, living in the midst of an intellectual atmosphere in which reigned a most intense life, one of the first and blessed fruits of returning peace after the long disturbed condition of Europe ; a member by his very position, and by his universally acknowledged merit, of that circle of highly cultivated men, the *élite* of intellectual Germany, gathered in Berlin, his rich powers expanded to their natural limits, and the fruits of that long and laborious period of preparation which had preceded, came to full maturity. We may say that after the first ten years of his residence in Berlin, in the midst of such favorable circumstances, Ritter's mind had grown to its full stature, and his scientific views had taken that definite form which they preserved to the end of his life. These constituted, indeed, the noble share of light allotted to him. Nearly thirty years more were found too short to execute the grand conception that was before him as the goal to be attained.

Ritter entered upon his new duties with his usual ardor and cheerfulness. He was bent at the same time with no less earnestness on the continuance of his publications. In the same year, 1820, he had published a volume under the title, *Vorhalle Europaeischer Voelkergeschichten vor Herodotus am Kaukasus und an den Gestaden des Pontus*, or Vestibule to

the history of European nations before Herodotus, around the Caucasus and on the shores of the Black Sea"—a subject which had grown under his pen when writing the second volume of his *General Geography on Western Asia*. The first edition of the *Erdkunde* being exhausted, the following year, 1821, was devoted to the preparation of a second, much enlarged edition, the first volume of which, containing Africa only, appeared in January, 1822, thus beginning the new series of volumes which compose the work we now possess. That first fruit of his literary activity in Berlin, as he calls it himself, was followed by a long interval of full ten years, during which he issued only two papers read before the Academy of Sciences, a very graphic and interesting description of India in the Berlin Almanac for 1824, and several smaller contributions.

But that period was none the less one of intense activity for him and of paramount usefulness for the rising generation. The claims upon his talents as an academic teacher, became more and more numerous. In addition to his previous duties he took charge, from 1822, of the chair of history at the military school, left vacant by the death of his friend Woltmann. In 1825, he was intrusted with the direction of the studies of the corps of cadets. He was honored with a call to instruct in history Prince Albert of Prussia, a duty which he performed during several years. The Crown-Prince of Prussia, now Frederick William IV., whose taste for historical studies and brilliant attainments in that department of knowledge are well known, held Ritter in particular esteem, and the modest scholar was not unfrequently invited, during the winter months, to deliver discourses on subjects connected with Geography and history, before a select and private circle assembled in the royal palace. These marks of high favor and of trust, and the growing popularity of Ritter's lectures at the University, cheered him on in the work of diffusing, by oral teaching and by personal influence, the new views and methods in geographical science which he believed to be more consonant with nature itself, and helped, no doubt, the reform movement which originated with him and now began to spread itself. His lectures in the halls of the University were soon regarded as such as all students interested in true humanitarian culture should hear. While a large number of officers of the Prussian army were trained by him every year, or studied under his immediate direction and influence, hundreds of students left the University, carrying with them into all parts of Germany and into all stations of life, the remembrances

of his suggestive instructions, and the conviction that a new and better era had begun for the science of the Globe. Thus was prepared that renovation of Geography in the University and in the school which was demanded by the progress of the natural and historical sciences, but which awaited the genius of Ritter to assume its shape, and his guidance and spirit to produce its full effect, as it now has throughout Germany.

As one who had the privilege of listening, during a period of five years (from 1830 to 1835), to nearly all his courses of lectures, I may be allowed to add my humble testimony to that of so many of his hearers who remember his teachings with delight. Ritter, indeed, as an academic teacher, during his long University career of thirty-seven years, achieved a success rarely equalled. Few can boast of a more constant popularity. He came to Berlin almost unknown to the students, as was indeed the science itself that he was called upon to expound. A few sessions sufficed to increase the number of his hearers so as to fill the largest halls in the University. Not by any effort of striking eloquence of words or manner, did he secure a willing ear from his pupils, but by offering to their eyes a thorough, substantial, and yet pleasant picture of the vivid images and ideas which filled his own mind. His eloquence was not an impetuous mountain-torrent, with its brilliant cascades, its misty clouds, and tinted rainbows; it was a majestic stream gently rolling its mighty but peaceful waters, now amidst the green forest yet untouched by the hand of man, now among the rich fields, the flowery lawns, and populous cities born on its banks; never destroying, ever fertilizing all that it touches. Thus was Ritter's manner dignified, but always unassuming, simple, and natural. The tone of his full and harmonious voice breathed with kindness, and exerted, (I may be permitted to give at least my personal impression), a peculiar attraction. His words were always instructive and suggestive. The hearer could not help being impressed with the fulness and thoroughness of knowledge, the perfect mastery and love of his subject evinced by the lecturer, while at the same time he was charmed by the happy selection of the facts presented, which left before his mind, in clear outlines, the most essential traits of the subject. The drawings that he traced on the blackboard with the graceful ease of a skilful and practised hand, rendered his descriptions still more effective.

Another cause of his success is to be sought in the noble impulses of his moral nature. Ritter loved and pursued the truth for itself, but he loved man too. He was unwilling to

keep for himself the gift that he had received. He loved to teach ; he was happy in imparting to others the results of his discoveries ; his hearers felt it. Having been trained to become a teacher, his attention was constantly directed theoretically and practically towards finding the best method of training the young up to that high standard of knowledge which was before his mind. This explains the vast influence that he exerted, not only on science in general, but on the school system, and on the method of teaching his favorite science.

Of the regular courses of lectures that he used to deliver in the University, that on general comparative Geography (*Allgemeine Erdkunde*) gathered usually the greatest number of hearers. Those on Asia and on Europe, the historical continents par excellence, were not less interesting. But the most popular of all were the free courses (*publicums*), which he used to deliver twice a week, ordinarily in the winter session, on one or another of the most classical among the historical regions of our globe, Greece, Rome, and Palestine. Theologians, philologists, lawyers, men of intelligence of all classes, flocked there with the same eagerness, to hear from the lips of such a man the authentic and life-like description of these hallowed spots, these geographical centres of human activity, a description of which, in the mouth of Ritter, became a most graphic and instructive commentary on those historical events which have left the deepest mark in the annals of mankind.

The foundation of the Geographical Society of Berlin, in 1828, by Ritter, together with some friends of a kindred spirit, is another fruit of that period of his activity. Humboldt had just returned to Berlin, and delivered his celebrated course of sixty-one lectures on the *Cosmos*, which had swelled higher still the tide of popular taste in favor of the science of nature and Physical Geography in particular. This society soon became a welcome centre, not only for new geographical information, but also for communications on all kindred sciences, as well as for a social intercourse of the most pleasant kind among scientific men. Ritter was the soul of it, and much of that social kindness and of those liberal and enlarged views for which that society is distinguished may, doubtless, be attributed, in a great measure, to his influence. Admirably seconded by such men as Prof. W. Dove, the eminent physicist and meteorologist, and others, he abundantly contributed to the last to preserve its high scientific character by numerous communications drawn from his own studies, from his journeys in various parts of Europe, and from much new information sent

to him from all parts of the globe. It is well known to all in this audience that one of the two best geographical journals of Germany, the "*Zeitschrift für Allgemeine Erdkunde*," is published under the auspices of the Geographical Society of Berlin.

While so usefully engaged Ritter did not lose sight of the work which it was the object of his life to perform. Thanks to the ever renewed freshness of his mind and to his excellent health, he had thus far found time for continuing his studies; but he now longs for greater leisure, which may permit him to resume the interrupted publication of his *General Geography*. By the influence of the Crown-Prince, who fully understood the high importance for science of a speedy termination of that classical work, he was enabled in 1831, with the consent of the Ministry of Public Instruction, to lay aside all business and duties not immediately connected with his studies. The result was not long in manifesting itself. In 1832, the second volume of his "*Erdkunde*," the first of Asia, a volume of nearly twelve hundred pages, was published, and inscribed by the author to the Crown-Prince, as a token of gratitude for the precious leisure granted to him. From that time until 1838, six other volumes of equal size, or one volume a year, were issued, and give evidence of the amazing industry of that great scholar; and in the twenty-one years following, that is, to the end of his life, eleven volumes more, or one volume every other year, tell of his ceaseless activity, notwithstanding his advancing age. The last, and nineteenth volume, which nearly terminates Asia, was issued but a few weeks before his death.

During these long and assiduous labors the only interruptions that he allowed himself, were the journeys that he used to take nearly every year in the long autumn vacation. But even then it was only changing the scene of his studies. Notwithstanding the prodigious erudition evinced in his work, which would seem to suppose a life entirely spent among books in the stillness of the closet, Ritter never, at any period of his long career, gave up that familiar intercourse with nature from which he had derived, as from a pure source, his best and deepest instructions. When came the hot summer days, shaking off the dust of the libraries, he went to visit his old and true friend again. Selecting one of the regions of his favorite continent of Europe, as an object of new study, he would live for months, now amidst the grandeurs of the Alps or of the Pyrenees, now under the happy sky, among the monuments and the people of Italy, or again amid the stern landscapes and

hospitable inhabitants of Scandinavia. He returned with an invigorated body, and with a mind refreshed and ready for new labors. He thus visited successively the most interesting countries of Europe. Central and Southern Germany, and the system of the Alps were the objects of a repeated and thorough examination, each time with a special object in view. Thus also Switzerland, that he loved above all, and Northern Italy, the Pyrenees, the South and the West of France, with the central plateau of Auvergne and its extinct volcanoes, Belgium, Holland, Denmark, Sweden, and Norway, were, one after the other, drawn into the yearly extending circle of his excursions. A long journey in the south-east of Europe made him acquainted with Hungary, the table-land of Transylvania, as remarkable for the variety of its races and nations as for the interest presented by its geographical structure; with the extensive plains of Wallachia and Bulgaria, Constantinople, and at last with the classical soil of Greece, that he knew so well how to describe. He never saw, however, Palestine, which had been on his part the object of so minute a study; and still every spot of it had become so familiar to him, that when he was lecturing on the Holy Land, his hearers could scarcely help believing that he was giving them a narrative of his own travels. It is said that when asked why he did not visit a country which was for him one of so deep interest—"What new information," said he, smiling, "could I derive from a visit to Palestine? I know every corner of it." None, assuredly, had more right to speak so than he who had seen so much of the land of promise by the eyes of a host of skilful observers. But I believe I am not mistaken when I regard that answer, if he really gave it, as a word not of boast, but of self-consolation. To know more than he did on Palestine, would have required an amount of time and means which were not at his disposal. But if the opportunities which we now have to see, in the course of a short season, the land of the patriarchs, and the theatre of the life and of the death of the Saviour of the world, had existed in the days of his strength, I venture to say that Ritter would have seen the Holy Land. He knew too well the paramount value of personal observations, even of a rapid glance at such a country, to esteem as of little account the privilege of storing his mind with truthful, life-like pictures from nature, instead of the unavoidably imperfect images traced by the slow pencil of a laborious study of absent objects.

The importance of these travels for Ritter, was great in every respect. Not to speak of the much needed relaxation

that they afforded to his mind, the accumulation of a larger number of new observations on most of the countries of the continent of Europe, towards which all his studies seemed to gravitate as towards a natural centre, was in itself a great gain. To these direct impressions from nature also, we may trace the source of that freshness of imagination and of style which he kept through life, that truthfulness and vividness of description which betrays the man fully conversant with nature.

But an advantage of a still more substantial character resulted to Ritter, from that acquaintance with nature so faithfully kept up. Nowhere more than in Europe do we find gathered within a small compass such a variety of natural regions, each with well-defined characters of land and people. They offer, indeed, to the observer specimens, as it were, on a diminished scale, of the most characteristic physical regions which compose the other continents. In the gigantic system of the Alps and of the Pyrenees, with their snowy peaks, their hardy and energetic races, we see the Caucasus and the Himalaya. In the fertile plains of Lombardy, that lovely garden of Italy, with its streams, its delta, its lagunes, we study the great plains of the Ganges, encompassed by the high wall of the Himalaya and the moderate heights of Deccan, as the plains of the Po by the Alps and the Apennines. Germany from the foot of the Alps to the sandy plains of the Baltic, gives us a perfect model of these lands of terraces, these forms of transition, as Ritter calls them, which gradually descend towards the low lands, and traversed by secondary chains of mountains form the grand steps through which the Alpine streams have to find their way to the ocean. Towards the East the course of the Danube, cutting through the high barriers which separate that series of continental basins, the plains of Bavaria, Austria, Hungaria, and pouring its waters into the open and maritime plains of Valachia, forcibly reminds us of the great Chinese streams descending by long steps through similar obstacles to the rich plains which border the ocean. The massiveness of the Scandinavian chain, with its broad and flat tops, its scattered and isolated peaks, its chasm-like valleys, is not without analogy with the most characteristic portion of the Andes, while its deep fiords, with those of Scotland, scarcely find elsewhere their equal, and remain the most remarkable type of that phenomenon.

In the races and nations of Europe the variety is scarcely less striking. On one side of the Alps we meet with the quiet

but deep nature of the man of the North, exhibited by the Scandinavian and the German ; on the other with the impulsive and passionate nature of the man of the South, so manifest in the inhabitants of the Mediterranean shores. In the West, the nations lead the chariot of human civilization ; in the East, semi-barbarian races scarcely follow it with Asiatic sluggishness, or are only forcibly drawn into the whirl of modern progress.

It cannot be admitted that a growing familiarity during half a century with geographical and ethnographical types so varied and so instructive, should not have exerted a deep influence on Ritter's mind and labors. Such a study, indeed, could not help increasing the marvellous power that he possessed by nature, to construct from imperfect, often contradictory documents, the grand traits of structure of the continents, and to establish the true character of the natural regions of our Globe that he could not visit. His innate tact in the selection of the materials to be received, ripened thus into an almost unflinching power of judging of the value of the various sources of information which he had to use. Moreover, during these excursions he paid frequent visits to the great centres of civilization—Paris, London, Vienna—in search of scientific documents, that he could not find elsewhere. He was received everywhere with marks of the highest esteem, and thus found welcome opportunities to form a personal acquaintance with the men most eminent in the various departments of study embraced in his own labors.

Ritter's reputation was soon established in Germany, though the new element of culture that he has developed is essentially cosmopolitan, and was demanded by the progress of our age, the form in which it was presented by him, his mode of thought, as well as his style, are so thoroughly German, that it is there that he found an immediate and full response. There he was understood and appreciated. German writers often speak of him as "*our Ritter*," thus expressing feelings not only of an affectionate reverence for him, but of a just national pride in him, and of a full identification with the man whom they thus honor. Abroad, the knowing ones acknowledged his value and gave him numerous tokens of high esteem. His royal master, as well as a number of other sovereigns, bestowed upon him the honor of various orders of merit. From 1822, a member of the Academy of Sciences of Berlin, he was successively elected a member of most of the learned societies in Europe and in this country, the long list of which he placed on the title-page of the

“*Erdkunde*,” not from a feeling of a vain boast, of which he was utterly incapable, but of grateful acknowledgment of the honor thus conferred upon him.

Thanks to a scientific position so eminent and so universally conceded, and to the lively interest which he took in all progress, Ritter became more and more, like Humboldt, one of the most important centres for geographical and ethnographical science, and a ready helper and considerate adviser for all those disposed to collect new information in all parts of the world.

When men who have wielded a vast influence for the good of mankind appear before posterity, the world first inquires about the work that they have achieved and the intellectual and moral powers by which they have accomplished it. It judges them as instruments, as parts of the great social organism, and determines its estimates by the importance of the functions performed by them. But human sympathy craves a more personal acquaintance with these prominent representatives of human nature. We want to know something of the deeper-seated qualities of mind and heart, which manifest their moral nature in their personal intercourse with their fellow-men, and reveal them as, on earth, citizens of a higher world. I may, therefore, be pardoned if I yield to the temptation of adding some words on the person and private character of Ritter. The task, indeed, is an inviting one. For if in him we admire the savant, we love and admire still more the man.

Ritter's personal appearance was full of serene dignity, one might say of antique repose. His tall and erect stature, his strong, broad-chested frame, his firm but quiet step, his well-marked features, his high forehead and intelligent eyes, gave him an imposing look, which, however, was tempered by a benevolent smile, an unassuming and kind manner, and an expression of goodness and candor which at once inspired confidence. The portrait, by Krüger, which is before your eyes, gives a perfect likeness of Ritter when about fifty-four years of age. He was then at the height of his popularity in the University of Berlin. Complying with the request of hundreds of his admiring students, he consented to have his likeness taken by the excellent artist just named, and the very successful original drawing was presented to him by the one who now addresses you, as a member of a committee of three, acting in behalf of their fellow-students.

Ritter's peculiar turn of mind was more intuitive than logical, more synthetical than analytical, more objective than

subjective. His deeply receptive soul, always ready for new impressions, was a pure mirror in which nature was reflected not only in its details, but in its totality. When after having worked out these impressions into a clear perception by a careful study, he tries by speech or pen, to convey them to others, it is still in that objective, concrete form which is before his mind that he does it, without attempting to draw on the picture the sharp and well-defined lines that a purely subjective, logical method requires, but that nature itself has not traced. While, therefore, his views and his method are entirely original, we seek in vain in his works for a formal system, an absolute idea rigorously carried out. His unflinching loyalty to the truth as he sees it, not as he infers it to be, seems to render such a systematization uncongenial to his mind. He shrinks, indeed, from all cold, formal, and empty definitions. Even his most characteristic conceptions, those which constitute the spirit of his method, preserved much of the nature of deep intuitions, the expression of which is always highly suggestive, but often lacks that clear, logical shape, which would make them easy to define, and would give them immediate currency. With a mind essentially constructive, he descends, nevertheless, with the most scrupulous care, into the study of the details, and it is upon the well-secured base of facts alone, and with a sense of the true, sometimes amounting almost to divination, that he builds up his broadest generalizations. From what precedes it can already be inferred that Ritter possessed, in a high degree, that noble faculty so prominent in all great students of nature, in a Humboldt, an Agassiz, that plastic imagination which gives us the power to keep before the mind the true and vivid images of natural objects, whether in their isolation, or by a synthetic view in their natural associations, as in one great picture, and thus enables us to perceive the relations which bind together the most distant parts, more easily and surely than a simple analytical process could ever do.

Of those moral excellences which adorn man's inmost nature, Ritter possessed also more than the usual share. His perfect purity of mind, his amiability, his unwearied kindness, won him the high esteem and the good will of all. His mildness of temper, the peace of mind which pervaded his whole nature, his loving disposition, spread around him an atmosphere of peaceful happiness, which exercised a sympathetic influence on those who came in close contact with him, and secured him their deep affection. He was a warm and most

faithful friend ; in the circle of his family most tender-hearted and affectionate. Himself childless, he was a father to many of the children of his immediate relatives, and others less near to him. He never knew any feeling of egotism. His modesty was as sincere as unaffected. He was always ready to ascribe his own progress to the influence and suggestions of other master-minds from whom he was conscious of having received new impulses ; as if a rich soil was not as necessary as the seed itself to the luxuriant growth of a noble plant into perfect beauty and richness of fruits. To give a public expression of his gratitude to such men as Pestalozzi, Soemmering, Ebel, Humboldt, was for him a delight.

With regard to the last, of whom he had become a rival in glory, no other feelings ever found room in his heart than those of affectionate reverence and of deep gratitude for the services rendered to science, by one whom he used to call "our great master." A more heartfelt and discriminating acknowledgment of the merits of Humboldt cannot be found than Ritter's address to him, in behalf of the Academy of Sciences of Berlin,* when that distinguished body, on the 4th of August, 1844, celebrated, by a congratulating deputation, and a banquet on the next day, the anniversary of the safe return, forty years before, of the great traveller from his memorable journey in tropical America. The answer of Humboldt is not less characteristic of his own modesty and feelings ; and well may we rejoice at so noble an example and take heed to a lesson from so high a source. For this was not a simple exchange of politeness for the occasion. The life of both assures us that it was the expression of true feelings. Humboldt's death had no more sincere mourner than Ritter. Indeed, his last strength was used in writing numerous letters, four of which were directed to America, to urge, in warm terms, upon the sympathy of all cultivated nations, and especially of those in the Western Hemisphere, the claims of the "Humboldt-Stiftung" of that Institution, the object of which, now well known to you, is to perpetuate in a manner congenial to Humboldt's spirit, the memory of his name. Ritter hailed with equal delight every new advance arising out of the mighty impulse which started from him, and which seemed, in some manner, to go one step beyond his own results. He only rejoiced that his own labors had been instrumental in preparing it, thus proving that

* See *Zeitschrift für Allgemeine Erdkunde, Neue Folge*, vi. 318. *Mai*, 1859.

his most earnest desire was the promotion of knowledge and not of his own name.

But if all these noble gifts bestowed upon him by nature, were brought to the fulness of a harmonious and normal development, it is only by drawing new sap from a still deeper source of excellence, from a strong and living Christian faith. Ritter never spoke much on this subject; nor are there found in his writings any formal, uncalled for, expressions of his religious convictions. He was not the zealous, polemic, critical partisan of any particular intellectual formula of the Christian faith; but his life and his teachings breathed that meek, trusting, and loving spirit by which we recognize the true disciple of our great model. Here, as in his scientific efforts, the living substance prevails over the dead form. In that sphere also, we can follow the phases of a gradual, but sure progress, which led him to the aim. Brought up by Salzman under the rationalistic influences then prevailing in Germany, but in an atmosphere of great moral purity, his loving heart and scrupulous conscience soon led him further. In the second period of his life the feeling of his indebtedness to a kind Providence grew every day stronger, and increased the sense of his moral obligations towards his Heavenly Father. In the third period, which begins with his first sojourn in Berlin, his Christian convictions assumed a more definite shape. His friendly intercourse with that modest and living Christian, the Baron von Kotwitz, who was a blessing to so many in Berlin during a whole generation, doubtless exercised a happy influence upon him. Later in life we find in Ritter the sincere, humble, and joyful Christian, grown to his full stature, who reveals himself by that oneness of mind and heart, that harmony of thought and action, which can flow only from a perfect and willing obedience in love to his heavenly Master. But let his own words bear testimony to his deep convictions.

When his students requested of him a motto to be placed at the bottom of the portrait just alluded to, he gave them that sentence that you read in the autograph which is before you: "Our earth is a star among the stars; and should not we, who are on it, prepare ourselves by it for the contemplation of the Universe and its Author?" Truly, the expression of the spirit of his instructions and of his "Erdkunde!"

In the last letter that it was my privilege to receive from him, Ritter, alluding, without the shadow of a murmur, however, to his advanced age, his declining strength, his approaching departure, speaks also of that work, the object of his

life, which he was obliged to leave unfinished, a mere fragment of his whole conception ; “ but,” he adds, “ we live according to the higher calling which guides us, (and quoting Paul, Rom. xiv. 8,) for whether we live, we live unto the Lord ; and whether we die, we die unto the Lord ; and whether we live, therefore, or die, we are the Lord’s.” A touching testimony to his Christian resignation !

The following words from his private journal, found after his death, are more explicit still, and so well reveal his whole soul that I cannot forego the pleasure of making them known to you. I quote them from the translation of the excellent memorial by Dr. Kramer : “ Although at present, while preparing for a journey to the western part of France and the Pyrenees, I am healthy and well, life nevertheless lies in the hand of God, whose mercy and grace have guided my fate so wonderfully and gloriously, that I cannot but sing to Him, the All-good, praise, and glory with all my power, in all my thoughts and actions. Should it not please Him to let me return to my beloved family and to my calling, but should he assign me another place in his heavenly kingdom, that I may obtain happiness, a happiness which already here sometimes has moved me to tears of joy, then I ask my friends not to grieve over my going home, for all that the Lord does is done well. My eternal fate my Saviour in his great mercy will decide. In deep acknowledgment of my infirmities and sins, I am still full of trust and confidence, since I know that my Redeemer lives, who will make his people partakers of the mercy of the Eternal and Just one.” A glorious utterance, indeed, of his Christian hopes !

We believe in the word of Him, who said to the trusting petitioners, “ according to your faith be it unto you.” Carl Ritter has now entered the heavenly mansions, and is admitted to the contemplation of the wonders of the universe and the adoration of its Author, for which he was so well prepared. He left this earth, the theatre of his long labors, in profound peace, after a short illness, on the 28th of September, 1859. On the 1st of October his mortal remains were placed by the side of those of his wife, who preceded him by nineteen years. His immortal soul has gone to its long-desired home.

Such was the life of Carl Ritter. It flowed like a peaceful and fertilizing stream through the long period of two generations. With the steadiness of a healthy growth, and that harmonious use of all his powers of mind and heart, with that honesty of purpose, without which true wisdom cannot be attained, he pursued his lofty aspirations undisturbed by

the storms of the revolutions and of the wars, in the midst of which he spent the first half of his life.

The fruit of his labors he left to us, as a rich heritage, bestowed upon civilized mankind, and ready for all those who wish to have a part in it. It remains for us to examine in what it consists, and in doing it we shall soon perceive that the more intimate acquaintance that we have made with Ritter's character, is not without value for the right appreciation of his scientific labors.

Ritter, indeed, declares himself, in the Introduction to the "Erdkunde," that the fundamental idea which underlies all his work, and furnishes him a new principle for arranging the well-digested materials of the science of the globe, has its deep root in the domain of faith. This idea, he adds, was derived from an inward intuition which gradually grew out of his life in nature and among men, and could not be, beforehand, sharply defined and limited, but should shine, as it were, through the work, and become fully manifested by the completion of the edifice itself. That noble edifice is now before us. Unfinished though it be, it reveals the whole plan, and allows us clearly to perceive that fundamental idea on which it rests. It is a strong faith that our globe, like the totality of creation, is a great organism, the work of an all-wise Divine Intelligence, an admirable structure, all the parts of which are purposely shaped and arranged, are mutually dependent, and by the will of the Maker fulfil, like organs, specific functions which combine themselves into a common life.

But for Ritter, that organism of the globe comprises not nature only, it includes man, and with man the moral and intellectual life. If the idea of a great Kosmos, as applied to the universe, or to our physical globe, is not new, nay, is as old as the primitive cosmogonies of the past ages, it is the merit of Ritter to have made a special and most happy application of it to the geographical studies. None before him perceived so clearly the hidden, but strong, ties which mutually bind man and nature; these close and fruitful relations between man and his dwelling-place, between a continent and its inhabitants, between a country and the people which holds it as its share, these influences which stamp the races and nations each with a character of their own, never to be effaced during the long period of their existence. In this common life, however, man, the nobler element, is the ruling power. If, in the period of his infancy, nature is for man a fostering mother, in the days of his youth a loving sister, exercising on

him a shaping influence, in the time of his full growth and manful activity, it becomes in his practised hands, and under the guidance of his commanding mind, an instrumentality for higher purposes and for the performance of that work of intellectual and moral development to which mankind is called, and which is the normal end of this earthly economy. Considered under this new aspect, every portion of our globe, stamped by nature with a peculiar character, assumes a new meaning and a new importance. As the body is made for the soul, so is the physical globe made for mankind. In an organic body the disposition of the parts, the structure of the organs, cannot be accounted for except by the functions which they are destined to perform. So in the globe, the geographical forms, the size, the peculiarities of structure, of climate, the natural associations of plants and animals which characterize each of the continents, and of the well-defined physical regions of our planet, have no intelligible meaning, no obvious reason of existing in that particular shape, unless their final object is revealed by their powerful influence in shaping the development of the races and nations which live within their bounds, and by the use that those nations made of them as instruments of their activity in the common life of mankind.

This organic idea, if you will allow me the expression, is the new principle which is to substitute order for confusion, in that overwhelming mass of geographical, physical, and ethnographical details of which Geography then consisted. To the necessity of such a principle Ritter, doubtless, alludes, when selecting for the epigraph of the "Erdkunde," this word of the reformer of modern science, Lord Bacon, "*Citius emergit veritas ex errore quam ex confusione.*" This organic idea substitutes beautiful, intelligible symmetry, for unmeaning, casual arrangement; law for accident; relations of cause and effect for disconnectedness; unity for isolation. It gives us a criterion for judging of the value of each detail, and of the relative importance of each order of facts, which can only be determined by their relation to the whole. Fully carried out, it would give us a clear picture, and the true measure of the powerful influence of that constant factor of nature in the ever-changing life and relations of human societies through all historical ages. Nay, when casting a glance at that vast scene prepared by Providence for the moving drama of history, and seeing so many compartments, admirably arranged and ready, it seems, for any emergency, in which as yet no performance has taken place, are we not justified in believing

that the great geographical arrangements of our planet are foreshadowing the future destinies of mankind ?

One feels that to treat Geography from such a point of view and in such a spirit, is to begin a new science. It is the science of the living globe, it is physiological Geography. The old walks will not do any more. With a firm and trusting step we must boldly enter the new path which has been opened by the hand of genius, for that path alone will lead us to the temple of knowledge.

This view was the normal synthesis required by the rapid progress of physical, ethnological, and historical sciences, which, since the beginning of this century, have shed so much light on the deeper nature of the physical world and of human society. It was that harmonic unity of elements, diverse and yet akin, craved by every philosophic mind conversant with the results of scientific inquiry. The philosophy of history, that science of modern times, hails now, with joy, the birth of a still younger sister, the Philosophy of Geography, the one a help to the other ; both forever as inseparable as man is from nature.

Ritter not only laid down the principle of a new science, but he attempted to carry it out. He succeeded beyond expectation, for the task that he thus assumed was great, and seemed to exceed the strength of one individual man. It implied a careful and critical re-examination, under a new light, of the original sources of our geographical knowledge, and of the historical data connected with it, and a new method of investigation, of combination, and of exposition of the results. His predecessors in Geography could be of little avail to him. If Eratosthenes, says he, wrote the first astronomical Geography, Herodotus and Strabo the first geographical history and historical Geography, Bergmann the first geographical physics, Buesching the first geographical statistics ; these works, excellent though they were for their special purpose, could do little more than prepare materials for the one contemplated. Each of them lacks the principle of unity, which alone can place the geographical element in its proper light, and give to it its full value.

But among his distinguished contemporaries, none was to him of so much help as Alexander von Humboldt, who summed up in himself the progress of the age in the physical and natural sciences, as applied to the science of the globe. I have said how gratefully Ritter acknowledged his indebtedness to Humboldt's labors, which furnished him the indispensable foundation for his own edifice. His investigations of the gen-

eral laws of distribution of heat, represented by his system of isothermal lines, of the distribution of plants, as depending upon the two main elements of climate, heat and moisture, of the marine currents as modifiers of climate in similar latitudes, were of general application to all parts of the globe. His admirable labors on the tropical regions of the Western Hemisphere had revealed to the scientific world the true nature of that massive structure of the Andes, and of the vast table lands of Mexico, so gigantic in their proportions and still so simple when compared with the system of the Himalaya, the Alps, and the complicated nature of the plateau of Iran. He had shown the decided preponderance of these huge elevations in mass of large portions of the earth crust over the narrow chains of mountains in shaping the characteristic structure of the continents. He had demonstrated the intimate connection of these grand plastic forms with the rapid changes in the climate, the plants, and the animal life, which are observed at every step, when ascending their slopes, and delineated, in vivid outlines, the various zones of ever-changing vegetation, through which the traveller gradually passes from the luxuriant forests and stifling atmosphere of the plains of the Amazon to the bare or snow-clad paramos of the Andes. Instead of the unmeaning uniformity suggested before Humboldt, by a glance at the map of tropical America, we now see rising before our minds a series of richly colored pictures, a series of physical regions, of well-defined geographical types. We see how they owe their existence and their special characters to these fundamental traits of the structure of the continent, and to the powerful influence which that structure exercises on the climatic conditions, and through them, on animated nature and man himself. Here the boundless Llanos of the Orinoco, alternately a burnt, dusty, and lifeless desert and a sea of verdure, teeming with temporary life : there the Selvas of the Amazon with their endless, impenetrable forests, their luxuriant solitudes, as yet untamed by civilized man, too powerful in their exuberance of nature life, for the few scattered savages, the only tenants of these rich wastes. At mid-height in the Andes, the happy regions around Ibague, Popayan, Loxa, with their everlasting spring, their murmuring brooks, their shady forests, and evergreen foliage ; on the broad summit of the Andes, between a double row of the highest volcanoes of our planet, the cool, but healthy valleys of old Peru, with their invigorating air, their open and cultivated plains, their extensive lakes, their ancient civilized people of the In-

cas, who from this lofty abode, as from a high throne, exercised a beneficent power on the surrounding slopes down to the shores of the ocean. In delineating, with a master hand, all these natural types so strongly marked with distinctive characteristics, these sharp contrasts between sister countries of the same landmass, and that variety of natural aspects, Humboldt actually revealed for the first time the true nature of the continent. He did more, for he clearly traced the close connection and the mutual dependence of all those orders of natural phenomena, and taught the true method by which such an investigation should be conducted in every other portion of the globe.

Such a knowledge, Ritter felt, was to be acquired of every other continent, and above all, of the historical continents. That alone could be a safe basis for the further study of the influence of those distinct natural regions on man's character and peculiar development, and on the special functions performed in the civilization of mankind, by the nations which occupied them during the periods of their growth and activity. Applying to the study of Geography the objective and comparative method to which the natural sciences owe their rapid progress and a deeper understanding of the system of organized beings, Ritter carried out a series of investigations which led him to results which are acquired forever to geographical science, and are, or soon will be, universally regarded as fundamental truths. I beg leave briefly to mention those which have exercised the greatest influence on the recent progress of Geography, and are more characteristic of his method.

Every one of the great landmasses raised above the ocean is a geographical individual, which differs from all the others by its size, by its form, horizontal and vertical, by the arrangements of its parts or its internal structure, by its climate, by the peculiar association of plants and animals which belongs to it, and by the character of the race of men which occupies it. The continents are the primary organs in the great organism of our planet. Their specific characteristics have to be determined by a careful study of all their elements, and a close comparison of their analogies and differences. Their relative situation, the arrangements which bind them into a connected whole, and their peculiar position with regard to the great zones of climate, or their physical situation, as we might call it. "*Räumliche Anordnung und Weltstellung*," in Ritter's style, should not receive a less share of attention; for those general relations, combined with those

specific characters, are the fundamental causes which determine their special functions in the life of nature and of mankind. Ritter discussed each of these topics in a series of five papers which were read before the Academy of Science of Berlin, between 1826 and 1856, and which have since been reprinted separately in a small volume, to which I have alluded, together with the introduction to the "Erdkunde," under the title of "Memoirs to serve as a foundation for a more scientific treatment of Geography," "*Abhandlungen zur Begründung eine mehr wissenschaftlichen Behandlung der Erdkunde.*"

In treating of the configuration of the continents, Ritter considers both their horizontal dimensions, or the size and the contours, and their vertical dimensions, or the absolute and relative elevations of their mass which constitute their relief. To the study of this last element, which act so powerfully on the climate, and through it on all animated nature, and which has been nevertheless so long neglected, Ritter gives a decided prominence. A continent is not the flat surface that maps seem to indicate; it is a solid body, the plastic forms of which have to be carefully delineated. Ritter distinguishes the extensive low-lands, maritime and continental, from the massive elevations of the table-lands or plateaux, and these again from the linear elevations of the mountain chains. To the table-lands, or elevated surfaces, he assigns, like Humboldt, the most important part in these vast structures. He showed that every continent has for its centre a large intumescence which makes, as it were, its main trunk, and around which are grouped as many secondary organs, its various physical regions. From that high central mass, and from the mountain chains which often mark its borders, the main streams of the continent descend towards the low-lands and the ocean, through a series of terraces or mountainous districts full of fertile valleys, which connect, as transition forms, the central highlands of the low, maritime plains of culture which surround them. Still beyond, far projecting into the domain of the ocean, rich peninsulas, as in Asia and Europe, form a third circle, and with large islands, true fragments of the continent scattered along its shores, surround the whole structure with a series of most useful appendages, as with a garland of brilliant flowers.

When compared under this aspect, the three continents of the Old World, not to speak of the others, show striking differences. Africa has one large and uniform plateau filling the

Southern half of the continent, and descending on three sides by terraces destitute of low-lands, to the shores of the ocean. The Northern half, comparatively low and uniform, is a burning desert, separated from the main plateau by the fertile terraces and the plains of Soudan, and from the Mediterranean Sea by the long and Isolated mountainous plateau of the Atlas, and the small plateau of Barca. Simplicity and uniformity of structure is thus the share of Africa. Asia, on the contrary, has two central plateaux, one in the East, the other in the West, both with lofty mountain chains, broad terraces, extensive low-lands, and projecting peninsulas ; it is a double continent ; the land of huge forms, of extremes, and of the most striking contrasts. In Europe another type still prevails. The central table-land on which the Alpine system rests, loses its primary importance in the presence of the gigantic mass of the Alps and the mountain form, more broken, more articulated, as it were, becomes typical of the continent.

The contrast between the various continents is not less remarkable, when we compare the horizontal forms of contour which are themselves but the consequences of the variety of plastic forms just mentioned. Africa is a compact mass, shut up in itself, almost inaccessible to the influences coming from the ocean, deprived of these deep indentations, and projecting peninsulas, which abound in Asia and Europe. Even the corners of the triangle which seems to be the fundamental shape of every continent, are all rounded off, and the shape of Africa approaches that of an ellipse. The line of contact of land and water is reduced, as it were, to a minimum ; and that uniformity of outlines betrays the simplicity of its internal configuration.

Asia, on the contrary, is deeply indented, and its gulfs and peninsulas present themselves on a scale commensurate with the magnitude of that king among the continents. Innumerable continental islands, and among them the largest to be found amid the oceans, surround it, and add to it an amount of land almost equivalent to another small continent, while Africa can only boast of Madagascar.

Europe again, that peninsular continent of the Old World, is still more indented. Here the mixture of land and water is carried to an extreme. The line of shores of that smallest of these continents, surpass by one-half that of the large mass of Africa. One-third of its whole surface is cut off in peninsulas. If Africa is a vast trunk without members, Europe is the

most articulated, and, in its smallness, the most perfectly organized of all the continents.

Ritter traces the vast influence of these individualized portions of the landmasses which surround the main body of a continent, on civilization. Climates are diversified, the formation of distinct nations favored, a greater variety of human faculties called into action, mutual relations and reciprocal influences increased, which, in the indented continents, unfold the hidden powers of man to a degree unknown in the continents less favored in this respect. The coincidence between the uncivilized state of the nations which possess Africa, and the impenetrability of that continent, between the brilliant development of mankind in Asia, and above all in Europe, and the variety and perfection of their geographical organization, is too striking to be called a fortuitous one. It forces us to acknowledge, in that remarkable peculiarity of structure, one of the causes which have determined so great a difference of functions in these three mainlands of the Eastern Hemisphere.

The views to which I thus briefly allude, are among those which have acted most immediately on the reform of the geographical method used in the schools. The valuable works of Roon, Voelter, Kloeden, and a host of others in Germany, the highly suggestive manuals of such genial writers as F. de Rougemont in Switzerland, derive their special excellence from the application of these principles to geographical teaching. The whole system of school cartography had to be changed, and accommodated to the new wants thus created. As Berghaus' Physical Atlas, the only original foundation for all the others, which have appeared under different names, was called forth by Humboldt's labors in Physical Geography, so the crowd of the new German school atlases and wall maps, which seek by the best possible method, still to be found, to make clear to the eye, by drawing, by colors, or otherwise, the main features of the relief of the continents, were called into existence by the wants suggested by Ritter's method.

The relative situation of the continents and their climatic position, gives them a distinct historical character. For mankind Asia is the land of the rising sun, as also the cradle of rising humanity. It is the Orient *par excellence*. Europe is the land of the setting sun, the Occident, the land towards which the brilliant orb advances. Africa is the burning South, the Soudan of the earth, as Ritter calls it, the land of the mid-day sun. In Asia the nations look backward towards a luminous past. Traditions, carefully preserved, of glories gone

by, keep their eyes turned towards that golden age from which they derive their wisdom, leave them without the hope of ever attaining a higher blessing, and thus stop their progress. In Europe men look forward, their faces turned towards the advancing sun, following it in its march and longing to plunge with it into the ocean of a mysterious future. Africa, the land of the meridian sun, equally unmindful of the past and the future, is sunk in an inactive, unmeaning present. These three continents again are grouped into an Eastern Hemisphere, which is to become the Orient for the new Occident, for the New World of the Western Hemisphere, which, in its turn, represents the land of future progress, contrasted with that of the old traditions of the past.

By the historical element in Geography, Ritter means not a certain amount of historical facts connected with a geographical spot, but the variety of functions performed by the same geographical elements, or the same natural regions, in the different ages of civilization. These functions are necessarily variable, since they depend upon the power of the cultivated nations to make use of these elements furnished by nature, as instruments for the particular work which these nations are called upon to perform in history. At the beginning of civilization, when the first, the most urgent want, was the possibility of gathering together, within a moderate compass, a large number of men, and thus to establish the social and political relations, without which human progress is impossible, the large plains of culture fertilized by the main streams of the continents were of paramount, of almost exclusive importance. The rich valleys of the Nile, of the Euphrates, of the Ganges, of the Chinese streams, are the prominent geographical centres for mankind. The broad ocean, the Mediterranean even, lie then forgotten and without use. When the great historical work in progress was the education of the mental faculties of man by Greek civilization, how prominent was the value of every geographical feature of that little peninsula of Greece, of its mountains and valleys, of its indented shores, of its genial climate, of its situation between the lands of the old oriental civilization, and the Western peninsulas which awaited culture from her. How different again when Rome began the great social work of the Roman empire, which was to gather under one powerful sceptre, the scattered civilizations of antiquity. The land of Greece sunk into insignificance, but the central position of Italy, in the midst of the Mediterranean world, thus far without value, made Rome the natural heart of that

great organism. The Mediterranean, so neglected by old Egypt and Assyria, became the common arena and the bond of union of the extensive domains of Rome, and the high road of civilized nations. The open ocean, then the dreaded insuperable obstacle to a further extension of mankind, had no function in the development of man. But now that by the progress of astronomical science and the art of navigation, man has mastered that redoubtable abyss, and knows how to oppose the wind and waves by the power of steam, the ocean in its turn has become the highway of commerce and intercourse between the most advanced nations of the Earth. To its shores they flock feeling, as by a secret instinct, that the power and wealth of a nation, in this age of universal interchange of gifts, depend upon the free access to that great door which opens for it the richest lands of the inhabitable globe. Thus the relative value of every one of the geographical elements, is constantly changing for man with the development of his own powers and the progress of history.

It only remains for us to see how Ritter applied these various principles in his "Erdkunde." After what has been said, a brief review of the plan and the method pursued in it will suffice.

The intention of Ritter, as he informs us, was to treat of the whole globe in twelve books. This number was no arbitrary one. It is easy to perceive that the idea of a great organism to be studied and described according to divisions marked out by nature itself, and their actual relations, was constantly before his mind. Each book was to contain one of the primary geographical individuals, a continent, for instance. The first book was devoted to Africa, the second to Eastern Asia, which is almost a continent by itself, the third to Western Asia. These are the only ones which he has written. What the other books would have contained, we are not told. The continent of Africa is the most uniform in its outlines, in its structure, its natural features in every respect; that of Europe is the most varied, the most highly organized. The order pursued, therefore, is from the simple to the more complicated; from the lower organism to the higher.

In describing a continent, Ritter, as I have remarked, looks upon it as an individual structure, the controlling feature of which is a central plateau. Around that central mass, as around a main trunk, are spread the lowlands, and from its high margins descend stepwise, in every direction, long terraces with their valleys and other streams towards the low plains, or sometimes reach uninterrupted to the sea-

shore. It is, therefore, in that order that he describes the various parts of such a connected mass of land. Beginning with the central highland, continuing by its terraces and lowlands, he terminates by the peninsular appendages and the islands which belong to it. A first bird's-eye view, traced with master-hand, gives the general features, the plan of structure, as it were, of the continent, and indicates the arrangements and the relations of all its parts. Then entering upon the detailed description, and proceeding from the cold and less favored regions to the warmer and richer climes, he characterizes every natural division, treats of its physical condition, of its people, of its present and historical functions, and usually terminates by a retrospective view, in which he gives to the mind, enriched by the specific knowledge acquired, a still more complete and precise view of the whole organism and of its distinctive characteristics.

A rapid view of the application of this method of description to the continents of Africa and Asia, may substantiate this short statement, and serve as a key to the arrangement of the matters contained in the "Erdkunde," which appears to many rather intricately, perhaps because unusual. The first book, Africa, contains four divisions, *Abtheilungen*: High Africa, or the main table-land; the transition forms to the lowlands, with their terraces and their water-courses descending from the highland; the isolated plateaux of the Atlas and of Barca, and the lowland of North Africa, or the Sahara.

The large divisions are subdivided into sections and again into chapters (*Abschnitte* and *Kapitel*), which equally correspond to so many physical regions, but of less extent and importance. In the first division, which treats of the central highland, the first section is devoted to the South margin, and its terraces descending towards the Cape of Good Hope, with three chapters describing the high table-land of the Orange River and its race of men; the middle terrace of the Karroos; the lower terrace or the shore region. The second section comprises the Eastern border of the highlands and its terraces down to the shores of the Indian Ocean, with the two chapters treating of the Kafir coast, and of the coast of Sofala and Mozambique. In the third section we are led to the North margin of High Africa, in which we find, in four chapters, the description of the high terrace of Kaffa and Narea, of the table-land of Abyssinia in general, the plateau of Abyssinia proper, and the terraces which descend from that Alpine land towards the sea and the lowland of North Africa. The fourth section com-

prises the Western margin of the continent with four chapters, giving successively a review of the South-western coast of Africa from Cape Negro to Cape Gonzalès ; of the regions on the Zaire River, in Congo ; of the highland of the Ambos, and of high Soudan on the North. A fifth and last section is devoted to that almost isolated member of the continent, the Western half, or prolongation of, the North Margin, containing, in two chapters, the description of the table-land of the Mandingos, the region of the sources of the Senegal, Gambia, Niger, and the Kong mountains.

Having thus completed a first systematic review of the central highland, Ritter, in a second division, takes up the transition forms from the highland to the lowland, that is the great river systems and their neighboring regions, which are always the connecting links, the great highways between the two for the people and commerce. One section is devoted to the Orange river, the characteristic stream of South Africa. Another, in two chapters, to the terraces and streams of Middle Africa, the Senegal and Gambia, and the mysterious Niger with East Soudan. The master stream, Nile, follows next, in six chapters ; one for the region of its sources, and the upper course, two for the middle course in Sennaar and Nubia, three for the lower course, upper, middle, and lower Egypt, or the Delta Lands.

Now the attention of the reader is directed in a third division, to the isolated highlands of the Atlas and of Barca, which, detached from the main trunk of the continent, border it along the Mediterranean Sea and the ocean. The Atlas plateau with its mountain chains, its surrounding border regions, along the sea-shore and towards the Sahara, with the races which occupy it, and the small table-land of Barca, fill each one of three chapters.

The fourth and last division, the low-land of Africa, comprises two sections, the Eastern and the Western half of the great desert of Sahara and Sahel. In the first section, three chapters describe first the Eastern shore of that land ocean, and its entrances from Egypt ; then its Northern shores, and a third treats of the Oases and of their influence on the development of the neighboring nations of the desert. In the second section the description of Western Sahara and Sahel, and the tribes of the desert, occupies the last two chapters. A retrospective view of the whole continent of Africa closes the book.

The continent has thus been methodically divided into its

grand natural districts ; each has been described, and the mutual dependence and subordination of each of these physical regions, their arrangement into a grand organic structure, as it were, is constantly kept in view.

Nor does even that organic division, if I may call it so, stop with the larger geographical districts which correspond to the chapter. In nearly each of them we find a series of explanatory paragraphs, *Erläuterungen*, which make as many minor groups, or treat of special subjects which belong to regions described in the chapter. As an instance, we find in the chapters treating of the Delta the following *Erläuterungen* : on the two main arms of the Nile and the history of their changes ; on the inundations of the Nile, its freshets, its alluvial deposit, the foundation of cities on its banks in ancient times ; the history of the formation of the Delta of the Nile ; the valley of the Wandering, the Natron Lakes ; and a retrospective view of the Nile stream and its influence on history. Still more special discussions form separate paragraphs under the name of "Remarks," *Anmerkungen*. In all, the sources of information are carefully compared, weighed, and referred to in numerous quotations.

The same method of description, at once so exhaustive and so thorough, has been followed in the two books and eighteen volumes devoted to Asia. But here the extent of that mass of land, the variety of the physical structure, the high historical importance of almost every spot of that old parent continent, explain the necessity for the distinction of a much larger number of natural regions. It would be useless to mention here more than the grand divisions and the order in which they are treated.

I have already said that Asia being, as it were, a double continent with two central table-lands, forms two books. After an admirable introduction which gives a general view of the whole continent, Ritter begins with the central Highlands of Eastern Asia. The East and North margin and the central regions, the South borders, or the Himalaya system, are described in as many sections. Next, the transition forms and the great water-courses descending from the heights of the table-land, are considered ; the Eastern group, or China and its mighty streams ; the South-eastern, or Indo-China ; the Southern, or India proper, with the system of the Ganges, terminates the second book.

The third book, or Western Asia, is far more voluminous. Evidently when reaching the true historical regions, the work

grew under the pen of its author much beyond his expectation. One division, nay, one section alone fills one or more volumes. Western Asia, which begins with the seventh volume of the whole work, scarcely terminates with the nineteenth. The first division describes the lands which Ritter calls the transition forms between Eastern and Western Asia. The system of the Indus, with the Punjaub, Cashmere, and the high valleys of the Himalaya, the Hindo-Khu, the high tableland of Turkestan and the massive chain of the Bolor, down to the low-lands of the Caspian Sea, fill the volume. The Iranian World, or the central plateau of Western Asia, and the surrounding countries connected with it, begins properly the second half of the Asiatic continent and the second division. A full introduction, giving a synopsis of the plateau or Iran under its physical, archæological, and ethnological aspects, precedes, and gives the general features which secure for the Iranian world an individual character. The Eastern mass, or Afghanistan, the North and South margin, along the lowlands of Turan and the Persian Gulf; the Western mass, or Persia, and Aderbidschan, form as many large sections, and occupy two volumes. In the third division the transition forms, or the great water-courses are considered, the twin system of the Euphrates and Tigris filling two volumes. The fourth division begins the description of the isolated members of Western Asia. The Peninsula of Arabia to the South, occupies two volumes. The fifth division, in two sections, covers the Peninsula of Sinai, Palestine, and Syria, the first with one, the other with two volumes. The last division is devoted to Asia Minor the natural end, toward the West, of the plateau of Iran, and is treated in two volumes.

It is easy to see by the gradually greater extent given by Ritter to the latter part of his work, that besides the reason just assigned for it, namely, the increasing interest attached to those regions which have been, from the highest antiquity, the scene of history, the plan of the author underwent a slight modification. Ritter's habit of thoroughness and the abundance of new materials accumulating every day, give this latter part of the "Erdkunde" the form of a series of monographs, which may be considered as standard works on each of the countries thus described, and as embodying about the sum total of our knowledge up to the date of their publication. Among the most new, we may name the volume of Eastern Asia, containing a digested account of all the English and other labors on India and the system of the Himalaya; and again, the two

volumes on Arabia, which are entirely unique of their kind. The monographs of Sinai, Palestine, and Syria, belong, it will be conceded on all hands, to the most thorough which exist. A series of monographs of another nature, treating of the history, the geographical extension, and influence on civilization of several plants of culture and of domesticated animals, such as of cotton, coffee, of the camel, and others, are interspersed among the volumes of the *Erdkunde*, and remain models of the kind. In questions of that order Ritter seeks the laws, and one of his academical memoirs is devoted to an essay on the principles of a Geography of the natural productions useful to man.

The picture that I have just attempted of Ritter's ideas, method, and labors, sufficiently defines, if I err not, the part performed in geographical science by that faithful and gifted scholar, from that achieved by Humboldt. Humboldt seeks to determine the general laws of the physical world. Ritter seizes them as applied, and in their concrete and actual connection in every given country and in the whole globe, and considers nature in its totality as an element in the development of mankind, from which alone these natural forms and influences receive their true and final significance.

At the moment these faithful guides leave us to ourselves, when their voice will utter no more words of wisdom, it may be well for us to ask ourselves how far they led us in the high road of science, and what is the task which is still before us. Humboldt, with a surpassing richness of knowledge, attempted to give us a connected picture of the totality of the physical universe ; but admirable as is the *Cosmos*, after having read its eloquent pages, we pause and involuntarily ask for the final object of the Creator in building up that marvellous structure ; we ask for a tie which connects it with Him, at least that portion of the creation in which we dwell ; for a voice which rises from it as a word of praise, and we find it not. Far from me even the idea of casting a blame upon the great and good philosopher ; I am fully aware that his plan was purposely limited to the material world which is his theme. I only wish to remark that we cannot stop there.

It is, indeed, a universal law of all that exists, as I have elsewhere said, not to have in itself either the reason or the entire aim of its existence. Every order of facts, like every individual being, forms but a portion of a greater organization, the plan and the idea of which go infinitely beyond it, and in which it is destined to play a part. The reason of its exist-

ence, therefore, is not in itself, but out of it; not below, but above it. The explanation of the beautiful but often mysterious arrangements of the physical globe is to be found not in it, but in the higher moral and intellectual sphere of man for whom they were made, in order to be there the means of accomplishing a more exalted end than their mere material existence. The key which opens for us the mysteries of the evolutions of history, is to be sought in that future perfect economy which is its end, and towards which, under God's guidance, human progress is advancing with a steady step. A science of the globe which excludes the spirit-world represented by man, is a beautiful body without a soul. Ritter, as I trust I have abundantly shown, put a soul into that body. This will make his memory live forever in the grateful remembrance of all lovers of true science.

Let us, therefore, continue in the footsteps of these masters in science. Humboldt furnishes the means; Ritter marks the goal. Like Humboldt, let us study nature in a truth-loving and devoted spirit, and, with combined forces, perfect that edifice which he has already reared so high. Like Ritter, let us, with scrupulous care and a pure mind, pursue in all parts of our earthly domain the investigation of these wondrous harmonies of nature and history, of which he has traced the great outlines. With the lofty ideal which was before his mind, let us try to realize his conception, which still needs a further growth to unfold all its beauty; and we shall have a right to look with hope towards a future science and a future Cosmos, which will be the full and adequate expression of the wisdom and goodness displayed in God's plan of the material and moral creation, which will satisfy all the legitimate craving of the human mind for knowledge, and which by its very utterance shall be, according to Ritter's own words, man's song of praise and of adoration to the divine Author of the universe.

