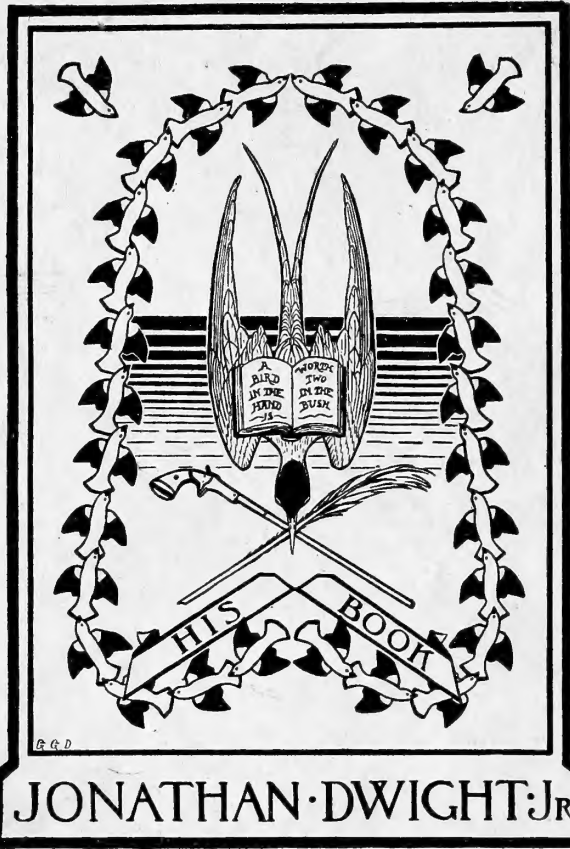

AN ADDRESS,
DELIVERED BEFORE THE
NEW-YORK LYCEUM,
BY JAMES DE KAY, M. D.





*Frederic Moore, from the Executors
of the late Thos Woodhull*

ANNIVERSARY ADDRESS

ON THE

PROGRESS

OF THE

NATURAL SCIENCES

IN

THE UNITED STATES:

DELIVERED BEFORE THE

LYCEUM OF NATURAL HISTORY,

OF NEW-YORK,

FEB. 1826.

BY JAMES E. DE KAY.

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New-York, March 6, 1826.

SIR,

In behalf of the Lyceum of Natural History we respectfully request of you, for publication, a copy of the Address delivered at the Anniversary meeting.

J. VAN RENSSELAER,
F. G. KING,
JOHN I. GRAVES, } Committee.

TO J. E. DE KAY, M. D.

ADDRESS.



THE progress made by our countrymen in those departments of knowledge which are more immediately connected with the wants of society, has been the theme of frequent discussion. That such progress has actually been made, is too obvious to be denied; and those who have been unwillingly constrained to admit its truth, have assigned other causes than are to be found in the active, enterprising spirit of our citizens, happily co-operating with the genius of our free political institutions. It has accordingly been urged that the strong stimulus of necessity, and a thirst for personal wealth and aggrandizement, have led to these results. Let us then inquire whether those sciences which are considered rather

as ornate than useful, and which are evidently unconnected with personal advantages, let us examine whether these have not also received a proportionate share of attention from our countrymen.

On the present occasion it is proposed to give a brief outline of the progress and present state of the Natural Sciences in the United States. Such occasional exhibitions are something more than mere appeals to national vanity. They are consonant with the usages of other nations, and if faithfully executed, are not always flattering to national pride. They become useful records of the labours of our cotemporaries, may indicate sources of information which might be overlooked by the inquirer, and often serve as an incitement to greater exertion with the rising generation.

Previous to the epoch of the late war with England, although a few works of merit had appeared at distant intervals, yet the Natural Sciences were but partially cultivated. The few individuals who had turned their attention to such pursuits were too widely scattered over this extensive country, to allow of that familiar interchange

of opinions which necessarily elicits further inquiries and discoveries. At a still earlier period we may refer to our colonial situation, the embarrassments arising from our exposed and peculiar position, and the example of the mother country, as among the most prominent causes which impeded the cultivation of Natural History in the United States.

Since, however, the period to which we have alluded, and the general peace which subsequently ensued, a spirit of inquiry has been awakened. The forest, and the mountain, and the morass have been explored. The various forms and products of the animal, vegetable, and mineral kingdoms have been carefully, and, in many instances, successfully investigated. A proper feeling of nationality has been widely diffused among our naturalists; a feeling which has impelled them to study and examine for themselves, instead of blindly using the eyes of foreign naturalists, or bowing implicitly to the decisions of a foreign bar of criticism. This, if restrained within due bounds, if it is not perverted into a narrow and bigotted sentiment, that has not unfrequently been

mistaken for national feeling, must be attended with beneficial consequences. To those who feel disposed to undervalue the useful and meritorious labours of foreigners, it may be suggested whether some deference is not due to the judgments of those learned individuals who have spent long and laborious lives, often in the investigation of a single group of phenomena, in the illustration of a single class, order, or genus of natural objects.

In the following pages we propose a sketch, which must necessarily be brief, of the progress made in Mineralogy, Geology, Botany, and Zoology, and shall then conclude with a notice of the travels performed by individuals, or under the auspices of the government, with a view of enlarging the boundaries of Natural Science.

MINERALOGY.

The first attempts to arrange minerals by a certain supposed resemblance in their properties, was evidently unsatisfactory and insufficient. The external characters and crystalline structure shed further light on this subject; but it was not until the com-

position of minerals by chemical analysis was attended to, that Mineralogy was fairly entitled to take the rank of a science. No part of Natural History, perhaps, presents greater charms to the youthful student. The attempt to classify and arrange, in a connected series, the different stones and earths, is often the first essay of the young inquirer into nature; and, as in a new country, it was natural to anticipate the discovery of new forms and combinations of minerals, the attention of our naturalists was early directed to this science.

The experiments of Mr. Cloud on the fusion of metals, the treatise of Mr. Cooper on the blue earth of New-Jersey, and those of Mr. Cleaveland, as contained in the *American Phil. Trans.* are among the early American essays in this department. In recurring, however, to the early history of Mineralogy in the United States, we cannot pass over in silence the labors of Dr. Archibald Bruce of this city. Early imbued with a taste for this pleasing study, he improved the opportunity afforded by an intercourse with the learned in Europe, and by a careful investigation of the mineral products of

his own country. Equally zealous in the acquisition of knowledge and liberal in imparting it to others, he commenced in this city the first journal of a purely scientific nature ever established in North America. Ill health, and the duties of an arduous profession, prevented its continuance beyond a single volume, but no one who is desirous of studying with advantage the Mineralogy or Geology of this country, will fail to refer to the *American Mineralogical Journal*.

Hitherto the student had been compelled to consult the rare and expensive systems of European authors, in order to become acquainted with the minerals of his own country. The best of these were in foreign languages, and the progress of Mineralogy was much impeded by the want of suitable elementary works. To supply this deficiency, Professor Cleaveland published in 1816 an *Elementary Treatise on Mineralogy and Geology*, illustrated by six plates. In this work Professor Cleaveland has combined the peculiar excellencies of the German and French schools; adopting the technical and minutely descriptive language of the former, and the accurate and philosophical syste-

matic views of the latter. From the communications of his friends, notices in various scientific journals, and his own personal observations, he has presented a rich catalogue of minerals, and a copious list of localities. A second edition much enlarged, and which was eagerly demanded, made its appearance in 1823, and Professor Cleaveland is now understood to be engaged in preparing a third edition.

An interesting essay under the title of *Outlines of the Mineralogy and Geology of Boston*, by Mr. Dana, appeared in 1818. This contains a useful catalogue of the minerals found in Boston and its vicinity, arranged in systematic order. A list of the rocks after the arrangement of Werner, and a map illustrating their geographical distribution accompanies the work.

Mineralogy has now become a popular branch of science, lectures are delivered in every considerable town in the Union, and extensive cabinets of minerals are to be met with in every direction. Increased attention has been paid to the composition of minerals, and several of our countrymen, with a view of perfecting themselves in this

delicate branch have enrolled themselves in the School of Mines at Paris. Many new mineral species have been firmly established, and others which were doubtful have been re-examined, and restored to their proper places in the system. The analyses of our president Dr. Torrey, of Seybert, Keating, Bowen, Vanuxem, and others, have thrown much light upon the Mineralogy of our country, and the pages of the *American Journal of Science and the Arts* bear frequent and honorable testimony to the industry and talents of our Mineralogists. Nor have the crystallographical characters been neglected. A profound acquaintance with this subject has enabled Dr. Troost of Philadelphia to discover a new form of *Cymophane* and *Pyroxene*, of *Andalusite*, *Laumonite*, *Apophyllite*, &c. and to detect the identity of some supposed new minerals with other species previously well known and described. Among those works which have contributed, in no small degree, to give an impulse to Mineralogical researches, are the various local catalogues of minerals which have been occasionally published within the last few years. Of these,

it is sufficient for our present purpose to mention the *Catalogue of Minerals which have been discovered in the State of New-York*, by M. H. Webster, of Albany. In this work the minerals are arranged under the heads of the respective counties and towns in which they are found. A different arrangement is pursued in the *Catalogue of Minerals found in the State of Vermont, and the adjacent States, &c.* by Professor F. Hall, of Middlebury College. As this catalogue was designed principally for the use of persons who have attended Mineralogical Lectures, in making collections of specimens, the compiler has arranged the minerals in alphabetical order, and has added a number of the most interesting minerals which have been discovered in other parts of the United States. The most extensive and complete work of this description, is the *Catalogue of American Minerals with their localities, &c.* by Dr. Robinson. This likewise includes those minerals which are known to exist in the British Provinces, and the arrangement, like that of Mr. Webster's, is by towns, counties, and districts in each state and province, in alphabetical order. The industry of the

compiler has enabled him to assemble together nearly five thousand localities of minerals, of which Massachusetts and New-York contribute the largest proportionate share.

Other pleasing proofs of the ardor with which this study is pursued, are to be found, as we have before remarked, in the existence of numerous public and private mineralogical collections, which are to be met with in every town of note, and even in many villages, from Maine to Louisiana.

But it is not the properties of minerals alone, nor the regular and complete systematic arrangement of which they are susceptible, nor the beautiful and harmonious laws observed in their structure, that form their complete history. To determine their relative position, their disposition and arrangement in various parts of the globe, constitutes another division of Natural Science, termed

GEOLGY.

This does not consist, as many have imagined, in mere ingenious speculations concerning the origin of the globe, or in idle

conjectures about the changes it has subsequently undergone. It is, or should be, the result of actual examination into the arrangement and structure of the various materials composing our world, or in deductions drawn from such examination. As a consequence of the general diffusion of mineralogical knowledge, much attention has been directed to the investigation of the rocks and mountain masses of our country.

Previous to the year 1812, the published notices on our Geology were few and unimportant, and little more was known in a geological point of view, of the United States, than that they extended along the coast of the Atlantic, and were bounded on the north by a chain of mighty lakes. Mr. Maclure, a gentleman peculiarly qualified for such a task by a familiar acquaintance with the most interesting formations of Europe, commenced a personal examination of this country, which he traversed in various directions. The result of his labors was given to the public in 1817, under the title of *Observations on the Geology of the United States*. This is a bold outline, sketched by

a masterly hand, and replete with the most valuable and interesting information.

The Geologists of Europe, who had been chiefly occupied with their theories and speculations, and from the phenomena of a mole hill had not unfrequently deduced principles on which depended the formation of a world, were struck with the simple, yet grand features, presented by this geological map of America. The different sects of Geognosts at first only perceived in this outline, a further confirmation of their peculiar views, but it soon became apparent that the facts there detailed were not strictly in accordance with the views of either of the two great parties which at that time divided the Geological world.

Not the least instructive parts of this essay are his observations upon the fertility of the soil in different parts of the Union, as connected with the nature of the subjacent rocks, or as dependant upon their decomposition. As an evidence of the accuracy of his deductions on this subject, it may be mentioned that his conjectures respecting the nature of the soil in the country

west of the Mississippi, founded on the imperfect data at that time in his possession, have been verified by travellers who have subsequently explored these regions.

Much of this outline has been filled up by the labors of succeeding geologists in different sections of the Union, and the materials for this purpose are daily accumulating. Among the most important of these we may particularize the various geological notices of Dr. Mitchill in the *Medical Repository*, and more at large in the appendix to an edition of *Cuvier's Preliminary Essay*, published in this city in 1818. From the presence of marine organic relics in the soil and rocks adjacent to the great lakes, the learned professor conjectures that the ocean once filled the basins of the latter, and covered the surface of the former. He has exercised much ingenuity in tracing the barriers of this imaginary inland sea, and has indicated the principal spots where breaches are supposed to have been made, which drained the extensive country now included in the states of New-York, Pennsylvania, Ohio, and part of Virginia. The alluvial described by Maclure, is extended

to the east end of Long Island, and this appendix is remarkable as containing the first attempt at a systematic arrangement of the organic relics of the United States.

An *Index to the Geology of the United States*, by Amos Eaton, appeared in 1818. This was prepared as a text book for the pupils of the author, and is accompanied by a geological section extending from the Kaatskill mountains to Boston, or through five degrees of longitude. It is valuable as containing the first attempt at a general arrangement of the geological strata in North America. Three parallel sections, at the distance of fifty miles on each side, were carefully examined, in order to confirm his geological profile. It is no small praise of this work, and at the same time exhibits a gratifying proof of the interest taken in this science, when we state that a second edition was required and published in 1820, and formally recommended by the Troy Lyceum of Natural History, as an authentic record of geological facts. The section of strata is again given with many corrections and additions, and is extended to the Susquehanna, comprising nearly five degrees of longi-

tude. A useful grammar of geology serves as an introduction to the work.

In 1819 appeared a *View of the Lead Mines of Missouri, with observations on the Mineralogy, Geology, &c. of Missouri and Arkansas*, by H. R. Schoolcraft. A country which, as has been well observed, once raised the highest expectations in France, and caused the most memorable disappointment that France or Europe ever knew, cannot be viewed with indifference. The work of Mr. Schoolcraft is well calculated to satisfy the desire of being better acquainted with the mineral riches of this country. The region of these lead mines is on the west bank of the Mississippi, between the 37th and 38th degree of north latitude, and comprises an extent of about three thousand square miles. Zinc and iron are likewise found here, and have been worked to some extent, but the most valuable mineral, from its abundance, is the lead. This has been hitherto taken from a red marl, in which it is loosely disseminated in rolled masses, under the form of a sulphuret. Even with the present sparse population, and the rude and imperfect processes employed, these mines yield

five million pounds of lead annually. The mines are the property of the United States, and are leased for a term of years to individuals at a low rate. This system of retaining possession of mines, salt springs, &c. on public lands, by the general government, seems to have been copied from some European model, and is in complete opposition to the general spirit of our institutions. At the present moment we observe with pleasure that it is proposed by the government to sell these lead mines; in which case, new sources of wealth, as yet neither fully ascertained, nor even known to the community as far as they are ascertained, will be presented to the activity and industry of our citizens. Hitherto they have contented themselves with merely extracting the loose masses found in the soil, and have seldom gone deeper than fifteen or twenty feet. When improved modes of mining shall have been adopted, and the proper machinery introduced, there is no doubt but that the subjacent stratum of metalliferous limestone will be penetrated, and the annual quantity much increased. Many valuable details are recorded respecting the different processes

employed to extract the lead, and the work concludes with a copious catalogue of the western minerals, more particularly those which are employed in the arts.

The *Essay on the Geology of the Hudson river and the adjacent regions*, by S. Akerly, which was published in 1820, although necessarily incomplete in its details, yet adds much to the stock of our information on this region. It corrects many of the errors of preceding writers, more particularly those contained in an anonymous essay published in Paris in 1813, under the title of *Observations sur les iles et islots qui sont aux embouchures de l' Hudson, &c.* A geological section of the rocks from the Navesink highlands on the Atlantic, extending towards the Kaatskill mountains, accompanies the essay. In this section, it will be remembered, is comprised the celebrated localities of magnesian minerals, and within a very short space, we have a view of the different formations from the alluvial to the primitive.

Nearly simultaneous with the preceding work, appeared the valuable treatise of Mr. Hayden of Baltimore, entitled, *Geological Essays, or an inquiry into some of the Geological*

Phenomena in various parts of America. As Geology had, in a manner, grown out of Mineralogy, it was to be expected that the order and arrangement of rocks and mountain masses should have almost exclusively occupied our attention. Hence the nature and extent of that portion of the globe, consisting of loose sand and gravel, or what is technically called alluvion, has been much neglected. Hitherto these had been considered as occasioned solely by deposits from the ocean and rivers, and much ingenuity has been exercised to explain many appearances which could scarcely have depended on such comparatively trifling causes. The attention of Mr. Hayden was long since directed to the vastness of this formation in the United States, and as early as 1817, he commenced a personal examination of this immense deposit, which extends over twenty degrees of longitude. In his endeavours to account for its origin, he has satisfactorily separated it from the alluvial, distinguished it by the epithet *ternary*, and is entitled to the merit of having anticipated the important distinction recently established by the European geologists, in regard to this formation. In con-

nection with this subject, Mr. Hayden has examined, with great attention, the phenomena presented at the embouchures of our principal rivers, and has satisfactorily accounted for the peculiar appearance along the banks and shores. A vast collection of facts is accumulated to prove that all our great alluvial district has been formed by a sudden and violent deluge, accompanied by powerful and irregular currents, which buried numerous vegetables and animals, whose remains are now frequently disinterred. This flood, contrary to the speculations of Mr. Hill, in his *New Theory of the Earth*, published at Baltimore in 1823, is supposed by Mr. Hayden to have been caused by the melting of the ice at the poles, in consequence of a change in the axis of the globe. The general direction of this great overwhelming current, is strongly indicated to have been from northeast to southwest, and the evidences in favor of this hypothesis, are numerous and plausible. The disintegration of rocks, a favorite source of supply with all writers on alluvial districts, is very clearly shown by Mr. Hay-

den to be more limited than is generally supposed.

The *Geological Survey of the County of Albany*, in 1821, by Messrs. Beck and Eaton, a similar *Survey of the County of Rensselaer*, and a *Report of the Geological Structure of the County of Saratoga*, by Dr. Steele, will be found highly interesting, and adds much to our previous knowledge of these districts. These examinations of different counties will at some future period, furnish important materials for a grand geological map of the state of New-York. It is a subject of regret, that our own island, which has been settled for two hundred years, and now contains a population of more than 170,000 souls, should have received so little attention from the geologists, who, at different times, have resided here, or visited our shores. We are, in fact, accustomed to bestow an undue share of our attention upon the structure of the Ertzgeberge or Himalayah mountains, or to peruse with avidity minute descriptions of the respective formations of Paris and London, while we permit equally instructive phenomena, within our reach, and immediately

under our own eyes, to pass unnoticed, and undescribed.

An *Essay on Salt, &c.* by Dr. Van Rensselaer, was published in 1823. This work contains notices of its origin, formation, geological position, and principal localities, with a particular description of the American salines. We gather from this essay that this useful mineral is extensively distributed over the United States, the formation in which it is found extending across the continent, from the Alleghany to the North Pacific, between the 31st and 45th degrees of north latitude. In this immense tract, rock salt is occasionally found, but its locality is more usually indicated by brine springs. The author has collected many important particulars respecting the different salines in the United States. He estimates the quantity manufactured at a million and a half of bushels, which, together with that produced on our own sea shores by solar evaporation, is sufficient for the consumption of the country, and renders us independent of a foreign market.

The several elaborate papers of Mr. Hitchcock in the American Journal of Sci-

ence, have not only elucidated many obscure points connected with the rock formations of Connecticut and Massachusetts, but have powerfully contributed to promote an increased attention to geological inquiries.

To the same journal we are indebted for several articles by Messrs. Bringier, Pierce, and Cornelius, on the Geology of the southern and western states, and it gives us much pleasure to state that the legislature of South Carolina have recently authorized a mineralogical and geological examination of that state. The object of the legislature, in authorizing this examination, is stated to give every citizen an opportunity of determining with certainty the kinds, as well as the value and use, of the rocks and minerals found upon his lands; to form a collection of the different kinds of rocks, arranged according to the districts or counties, and at the same time to furnish materials for the mineral history of the state, and for a geological map of the same. The legislature of North Carolina, animated by a similar liberal policy, which is worthy of imitation by other states possessing more exten-

sive resources, have also authorized a geological and mineralogical examination of that state. Professor Olmsted, the gentleman charged with this important duty, has, lately, in his *Report on the Geology of North Carolina*, executed it in a manner worthy of his high reputation as a geologist.

The honorable and praiseworthy direction of the energies of the nation towards internal improvement, has elicited several excellent geological essays. Of these, we would particularize the *Geological Survey of the Morris Canal route*, by Professor Renwick, and the *Geological Survey of the district adjoining the Erie Canal*, by Mr. Eaton, in 1824.

The Erie, or, as it is sometimes called, the Great Western Canal, the peculiar boast and glory of our state and country, extends east and west from the Hudson to lake Erie, a distance of three hundred and sixty miles. The interesting district through which it passes, was carefully examined by Mr. Eaton, and the result is given in the work above mentioned. A profile of the rocks extending from Albany eastward to Boston, is added to the canal section, making in all, a distance of five hundred

and fifty miles, thus forming, perhaps, the most extensive geological section hitherto made from personal examination. One of the most singular facts announced in this work, is the existence of an uninterrupted stratum or layer, of argillaceous iron ore, extending from the Little Falls beyond Niagara, a distance of more than two hundred miles. This bed is from twenty to thirty miles broad, and about two feet thick.

Mr. Eaton has essayed in this work, to introduce a new nomenclature of rocks, but with what success must be left for future naturalists to decide. The very limited and narrow formations to which names have been applied in Europe, induced the author to substitute more appropriate and better defined names in their stead. Thus the secondary graywacke is called calciferous slate; swinestone, geodiferous rock, &c. &c. If, as most geologists admit, new names should be introduced to designate rocks which constitute such extensive formations, the propriety of the course adopted by Mr. Eaton cannot be questioned. Under all circumstances, no writer can justly be accused of too much boldness in proposing

changes in a science which is yet in its infancy, and which has hitherto been peculiarly the arena for hardy speculations and daring conjecture. But whatever may be the fate of this proposed alteration of nomenclature, the facts are detailed with great accuracy, and will be lasting monuments of the zeal, industry, and talents of the author.

The interests of science have been obviously advanced in this city, by the formation of the New-York Atheneum. Among the numerous lectures delivered before that institution during the past year, the *Lectures on Geology*, by our associate Dr. Van Rensselaer, demand our notice. The author has with commendable industry, from the writings of Humboldt, Mac Culloch, and others, produced a valuable outline of the science of Geology, and the occasional references to the formations of our own country, add much to the reputation of the lecturer and to the value of the work.

BOTANY.

This department of Natural Science has been prosecuted with much success. It would not be too much to assert that it has

attracted more attention than its collateral branches. This may be in some measure owing to the greater perfection displayed in the systematic arrangement, and physiological history of plants, to the superior attractions displayed by the varied and beautiful forms of the vegetable kingdom, or to the facility with which extensive collections may be arranged and preserved.

In the notices which we propose to give of the progress of this science among us, we shall necessarily be brief, as the same ground has been occupied by the writer of an able article on the history of American Botany in the thirteenth volume of the *North American Review*, and more recently by Professor Hooker, of Glasgow, in the *Edinburgh Journal of Science* for 1825, conducted by Dr. Brewster. Nothing has contributed so much to extend our acquaintance with the plants of this country, as the publication of local Floras, which have been already numerous, and new ones are now of frequent occurrence. It will be sufficient for our present purpose to mention the *Catalogue of Plants near Connasarga River*, the *Catalogue of Plants growing in East Florida*, Sill. i. and v.

The *Compendium Floræ Philadelphiæ*. The *Florula Bostoniensis*, Ed. 2. The *Catalogue of Plants growing within thirty miles of New-York*, and the respective Floras of Kentucky and of the District of Columbia. These have been omitted by preceding writers. A *Florula Ludoviciana* has also been published, but as it is a mere compilation from the loose and inaccurate notices of the Abbe Robin, it is extremely doubtful whether it has added any thing to the stock of our information on the botany of that region. The more recent, extensive, and accurate observations of Mr. Nuttall, as contained in his *Genera of North American Plants*, have ably supplied any deficiencies which the preceding work was intended to remedy. The *American Journal of Science*, to which we have frequently referred in collecting materials for this essay, and which, under the able direction of Professor Silliman, has rendered many and important services to the cause of science in America, contains descriptions of new species by Nuttall, De Schweinitz, Leavenworth, Torrey, Ives, and others. The obscure and difficult genus *Carex*, has been lately investi-

gated in the same Journal, by Professor Dewey. He has described eighty-four species, of which many are entirely new. The same subject has been recently pursued by Mr. De Schweinitz and Dr. Torrey in the Annals of our Lyceum. This *Monograph of the North American species of the Genus Carex*, contains one hundred and thirteen species, or more than double the number of species hitherto described in any work on American Botany.

The want of good elementary works on botany, has long been felt in this country. Those of Locke, Sumner, and Welch, and the republication of Smith's Grammar of Botany and other elementary books, have powerfully contributed to increase the number and activity of our young botanists. A sufficient evidence of the increased attention paid to this science, is to be found in the fact that four successive editions of *Eaton's Manual of Botany* have been published within the last four years.

Hitherto our botanists have almost unanimously agreed to consider the phenogamous part of the vegetable kingdom as an insulated study. From the comparatively

little attention that has been bestowed on our cryptogamous plants, no work has yet been published embracing them all in a general view. The great diversity of our climate, presenting the extremes of heat and cold, of dryness and humidity, and our soil offering every variety of surface, leads us to expect a corresponding exuberance of these productions when they shall be more fully examined. Their study, however, is difficult, as many of the tribes are too fugitive in their nature to be capable of preservation, and the student is consequently compelled to examine them in their native localities, with such aids as he may have at hand; while many others are so minute, or their fructification so obscure, as to require a high power of the microscope to detect their characters. The different departments into which this branch of botany is now subdivided, have been within a short time ably elucidated by some of the most distinguished naturalists of Europe, and in their systems we recognise many of our native species, which have been sent to them by their American correspondents. Our *mosses* have been described by Michaux.

Hedwig, Bridel, Beauvois, Hooker, and Greville. The *Jungermania* have been comprised in an excellent work by our countryman De Schweinitz, entitled, *Specimen Floræ Am. Sept. cryptogamicæ sistens Muscos Hepaticos, &c.* published at Raleigh in 1821. The marine and fresh water *Algæ* of this country have been almost entirely neglected. The few that were noted by Muhlenberg in his catalogue amounting to thirty one species, some described by Agardh from specimen sent him by our botanists, and a paper in the Annals of the Linnean Society of Paris, contain the only notices we have of this interesting and varied tribe.

The *Lichens*, in proportion to the number of species enumerated, have received a larger share of attention than any other branch of cryptogamous botany. A catalogue published in the Annals of our Lyceum, by Mr. Halsey, of those found in the neighbourhood of this city, comprises one hundred and seventy-five species; a large number considering the limited district examined, and the unfavorable nature of this region to the growth and developement of

this tribe of plants, in comparison with many parts of our country to the north and the west. These, together with those noticed by Muhlenberg, and others since detected, will increase the sum of our native lichens already known, to about four hundred species. In the immense division of the *Fungi*, although from the paucity of laborers who have undertaken to explore the mycological riches of our country, the impossibility of procuring foreign specimens for collation and comparison, or good instruments and the requisite books, it might almost be a subject of despair to the friends of botany. It is, however, creditable to our scientific character, that of the comparatively little that has been done, our countrymen have contributed so large a share. Muhlenberg, in his *Catalogus plantarum Am. Sept. hucusque cognitarum, &c.* has enumerated two hundred and five species, beside a number *nondum determinatae*. His Herbarium containing all his collections of this family capable of being preserved, is now in the possession of the American Philosophical Society at Philadelphia.

Our President, Dr. Torrey, in the second volume of the American Journal of Science, has described a large subterranean fungus, known in the southern states under the name of Tuckahoe, or Indian Bread, and designated by Dr. Torrey as the *Sclerotium giganteum*. This was subsequently changed by Mr. De Schweinitz to *S. coccoes*, and this latter name has been adopted by Fries in his Systema. This singular fungus contains according to the analysis of Dr. Torrey, that peculiar coagulable acid, which promises to be so useful in the arts.

The principal laborer, however, in this department, is Mr. De Schweinitz, unquestionably one of the first mycologists of the age. This gentleman has enjoyed the advantage of a residence of several years in Europe, and an acquaintance with the most celebrated botanists of the continent; and on his return to this country, republished a *Synopsis of the Fungi of North Carolina*, which had previously appeared in the *Acta Societatis naturæ curiosorum* of Leipsig. It contains an enumeration of thirteen hundred and seventy-five species, including a de-

scription of a new genus, and of three hundred and twenty new species. Since the publication of that work, the same gentleman has detected, in the neighbourhood of his residence at Bethlehem, Pennsylvania, and in specimens sent him by correspondents from different parts of the country, others sufficient to increase the list to two thousand species.

ZOOLOGY.

Has Zoology, or the history of animals, been cultivated in the United States with the same success as botany, or geology and mineralogy? The answer must be in the negative. Its progress has been impeded by the operation of the same causes which have affected the other branches; but in addition to these, it has had to contend against the unjust views which have been taken of its relative importance, and to a want of concert in nomenclature and systematic arrangement between the laborers in the different subdivisions of this science. The fact, that until the last few years it has been neglected in England, affords another mortifying, but sufficiently obvious

reason, why it has received so little attention here. A formal exposition of the utility of this science is hardly requisite before a society, expressly established for its cultivation. Thus much, however, we may be permitted to say, that few departments of knowledge demand more varied acquirements, more accurate habits of investigation, or a more familiar acquaintance with the labors of the learned in every part of the world.

Ten years ago, our animals were little known or carelessly described, and perhaps a stronger proof of the ignorance or indifference prevailing on this subject cannot be adduced, than the fact that the *Cervus virginianus*, or common deer of this country, was not satisfactorily known or identified, until within a very recent period. Shall it be added, that even for this we are indebted to foreigners? The formidable grizzly bear, the terror of all western travellers, is not to the present day sufficiently determined to be a different animal from the *U. arctos*, or northern bear of Europe.

Pursuant to the proposed plan of this discourse, we should proceed regularly through

every separate genus of this class, and exhibit the labors of our naturalists in each. This would, however be inconsistent with the brevity requisite on this occasion. It will be sufficient to indicate, in a general manner, the efforts made to illustrate the several great subdivisions of the animal kingdom.

Mammalia. Few works professedly on the animals of this class, have appeared in this country. To this division is naturally to be referred all investigations connected with the natural history of man. The history of the American race has received considerable elucidation from the labors of Mac Culloch, Heckewelder, and the naturalists attached to the two expeditions under Major Long. It was natural to expect that the physical history of man would have attracted the attention of the first visitors to this country, but their limited views are evinced by a perusal of their respective voyages. Even in those which have been projected for the purpose of extending our acquaintance with the different varieties of the human race, we may observe that the inhabitants of newly discovered countries are described, more

with reference to their dress and manners, than to their organization as evinced by their external characters. Indeed, it must be admitted, that Zoologists themselves have too often overlooked the history of man, as if he was not a link in the great chain of animated nature. A common opinion is prevalent that little more is to be discovered respecting the former inhabitants of this country; and that every thing beyond their manners and unmeaning ceremonies must be left to idle conjecture. This, however, is far from being the case. The question of their origin and descent, whether they are to be considered either directly or indirectly of Tatar origin, or, as some have maintained, are an original people, is capable of further illustration by a careful study of their peculiar physical characters. As much light will be derived from this source, as from the examination of their curious forms of language, which have but a very remote analogy with the dialects of any other nation on the face of the earth.

Of the quadrupeds distributed over the whole surface of the globe, about six hundred species are known and described.

South America possesses one hundred and eighty, and North America about one hundred and thirty species. Doubtless this number will be much increased by the future exertions of our naturalists; the smaller quadrupeds will furnish, of course, the largest proportion, and the examination of our fossil relics, will probably add to the number.

During the past year we have been favored with the first attempt at a systematic arrangement of our mammalia, under the title of *Fauna Americana*, or a description of the mammiferous animals inhabiting North America. One hundred and forty-seven species are described in this work, of which fourteen are new, and of these four are now extinct. The author, Dr. Harlan, has exercised much ingenuity and industry in assembling together the scattered notices and descriptions of his cotemporaries, arranging them in systematic order, and adding his own discoveries, which are numerous and valuable. Previous to the appearance of this volume, little attention had been paid by our naturalists to the only sure and firm basis on which the genera of Mammalia can be con-

structed. Various attempts had, indeed, been made, but hitherto without rigorously examining the dental formula. We shall take occasion again to recur to this subject.

As if the vast territory of the United States was too limited for their exertions, several of our naturalists have examined and given faithful descriptions of the animals of other regions. The *Isodon* of Cuba, by Mr. Say, and the very curious *Chlamyphorus* from the interior of Chili, by Dr. Harlan, deserve particular attention. We look impatiently for the promised work of Dr. Godman and his able coadjutors; which is to furnish us with a complete *History of all the hitherto known quadrupeds of North America*.

Birds. These have early claimed the attention, not only of foreigners, but of our own naturalists. Indeed, in all ages and countries, their beautiful forms, often decorated with the gayest plumage, their attractive habits and artless song, have never failed to render them objects of universal interest. A few inconsiderable and imperfect lists have been made, and of these we may indicate such as are contained in Jef-

fer's Notes on Virginia, and in the works of Bartram, Belknap, and Williams. The work of Vieillot, splendid and useful as it really is, loses much of its value from the circumstance of its being incomplete, and from the unnecessary changes introduced in the names of long established species. When will naturalists learn to shun the barren honors of a synonyme?

The great work of Wilson may be considered as having created a new era in American Ornithology. In this we have descriptions of two hundred and seventy-eight species, of which fifty-six are described as new. Perhaps no work contributed in a more eminent degree to create a taste for Natural History in this country, than the publication of these splendid volumes. The peculiar disadvantages under which Wilson labored in the progress of this work would have dampened and disheartened any spirit but his. His ardent enthusiasm for his favorite pursuits, and his noble disdain of the most appalling obstacles, are finely exhibited in his reply to a friend who endeavoured to dissuade him from the publication, "I shall

at least leave a beacon to show where I perished.”

Wilson was not, strictly speaking, a systematic naturalist; but he evinced great acuteness in the determination of species. He was an enthusiastic observer of the manners and habits of the feathered tribe; which he describes in the most vivid and appropriate language, and his almost living figures in this particular have never been surpassed. His friend Mr. Ord, has recently published a new edition of the three last volumes, in which the errors of nomenclature are corrected, and those improvements introduced which were rendered necessary by the advances made in this science, since the first publication. The ninth volume, entitled a *Supplement to Wilson's American Ornithology*, contains an enlarged biography of Wilson, which gives much additional interest to the work.

The American ornithologist will feel grateful to the Prince of Musignano for the very thorough manner in which he has corrected errors and settled synonymes in his *Observations on the nomenclature of Wilson*, as con-

tained in the Journal of the Academy of Natural Sciences. Other important additions may be found in this valuable Journal. The expedition to the Rocky Mountains, under the command of Major Long, has furnished us with twelve new species carefully described by Mr. Say. The plan of that excellent work unfortunately did not admit of figures to illustrate the department of Natural History. This deficiency is, however, now splendidly supplied by the *American Ornithology* of Charles Lucian Bonaparte, whose zeal and profound acquirements, as evinced in this volume, have added new titles of distinction to those already acquired by his illustrious family.

This work, which may be considered as a continuation of Wilson, will, when completed, leave but scanty gleanings to the future inquirer. Twenty-two species are figured and described in this volume, and should the two succeeding volumes contain as many, the whole number of species may be roughly estimated at three hundred and sixty. Our Annals contain notices by Mr. Clinton, relative to a beautiful species of swallow which has very lately appeared in

the United States ; but which, from present appearances will probably ere long be common over the whole country. To the same work we are indebted for the description, by Mr. Cooper, of a singular and interesting species of *Fringilla*, which had hitherto escaped the researches of our naturalists. The synopsis of all the North American birds, now publishing in the *Annals* by C. L. Bonaparte, will furnish an excellent manual to the American ornithologist.

Reptiles. Until within the two last years, the examination of our reptiles has been generally neglected. The confused and contradictory statements in the systematic works, and the difficulty of observing their habits in their native haunts, have combined to deter the inquirer. The article entitled *Description of several species of North American Amphibia*, by Professor Green, in the *Journal of the Academy*, contains the first attempt by an American naturalist, to describe and arrange some of our reptiles in a systematic order. They were at that time in a state of chaotic confusion, and Mr. Green has conferred no trifling obligation upon our herpetologists by his original and judi-

cious observations. We hope he may be induced to resume his labors.

The essays of Messrs. Lesueur and Say have illustrated, in an eminent degree, the history of the genus *Testudo*, which now includes fifteen North American species. The Saurian division of reptiles, comparatively few of which are found in this country, has been much enlarged by the addition of several species, of the genera *Agama*, *Lacerta*, *Scincus*, and *Ameiva*. Among the Ophidia our researches have been extremely limited. The expedition before alluded to has furnished us with excellent descriptions of seven, and the Journal of the Academy with three additional new species. The Batrachia have only very recently been investigated, and although their study is attended with peculiar difficulties, as they frequently change their color and markings when alive, and still more after death; yet our naturalists have not been discouraged by these unpropitious circumstances. We are chiefly indebted to our associate, Captain Le Conte, for the additions made to this department. His long and familiar acquaintance with species, has given additional interest and

value to his observations on the genera *Rana* and *Hyla*. The same subject has been further investigated by Dr. Harlan, who has contributed *Descriptions of several new species of Batrachian animals, with observations on the larvæ of Frogs*, which may be found in the tenth volume of the *American Journal of Science*.

The doubtful reptiles, of which five species are already known to exist in the United States, have been attentively observed by Dr. Harlan, and his able papers on that subject in our *Annals*, will be constantly referred to by the American herpetologist. In the same *Journal* will be found remarks by Captain Le Conte on the genus *Siren*, and the description and figure of a striking species. Our former president, Dr. Mitchill, has described in the *American Journal of Science*, that singular reptile which he has designated as the *Proteus of the Lakes*. Another allied animal, the *Amphiuma* of Dr. Garden, has been known for fifty years, but by some oversight had not been arranged in the systems, and, indeed, was entirely forgotten until it was again brought forward and described under the

name of *Crysodonta*. Additional observations on this highly interesting animal are to be found in the Transactions of the respective societies of Philadelphia and New-York.

Fishes. From the nature of the medium in which these animals exist, and the consequent difficulty of studying their peculiar habits, and likewise from the limited observations which have hitherto been made, to determine such differences as may depend on age or sex, this branch of Natural Science perhaps presents less of interest to the philosophical inquirer. The artificial and highly complex systems of Bloch, Schneider, and Lacepede, and even the more philosophical arrangement proposed by Cuvier, have all failed to a certain extent in securing the requisite support of naturalists. Hence the confusion in this department is such, that it is often difficult to determine with much accuracy the species designated by our predecessors. Under all these disadvantages, they have been very industriously studied by Mr. Lesueur of New Harmony, and his descriptions, with his excellent figures, have furnished many

materials for a future American Ichthyology. His *Memoir on the Chondropterygious Fishes of America*, in the Transactions of the American Philosophical Society, is one of the best zoological monographs with which we are acquainted, and like the work of Broussonet, will be found a useful model for the ichthyologist. Nor have separate treatises been wanting in this department. Mr. Rafinesque in his *Ichthyologia Ohioensis*, and Dr. Mitchill in his *Report in part on the Fishes of New-York*, have each endeavoured to illustrate the Ichthyology of these respective regions. The latter work, much enlarged and improved, has appeared in the *Transactions of the Literary and Philosophical Society of New-York*. Our *Annals* contain a few papers on this subject; the *Stylephorus*, and the *Cephaloptera Vampirus*, by Dr. Mitchill, and the description of an interesting species from the pen of Mr. Clinton. The pages of the *American Monthly Magazine* contain further descriptions of species, more particularly from the neighbourhood of this city.

Among the *invertebrated* animals, or those not furnished with a bony spine separable

into many parts, much has been done, but when we consider the vast field yet remaining to be explored, we must admit that there will still be left enough to employ our naturalists for many years. Our Crustacea have been thoroughly investigated by Mr. Say in the *Journal of the Academy of Natural Sciences*. We are not aware that any other American has devoted the least attention to this very singular group of animals. The extensive labors of Mr. Say leave us the less to regret on this account. Some idea may be conceived of the vast extent of the department of Entomology when we are assured that our naturalists are already acquainted with about nine thousand North American species. Mr. Say and Captain Le Conte, in the Transactions of the societies of New-York and Philadelphia, have furnished materials towards a system of American Entomology. The want of a good entomological manual is still felt by our young naturalists; this is indeed partially supplied by the *American Entomology* of Mr. Say, of which the second volume has recently appeared, but its expensive form

puts it beyond the reach of most private individuals. To the same able and indefatigable zoologist, and to our colleague Mr. Barnes, we are indebted for ample illustrations of our marine and fresh water shells. The Monograph of the extensive and obscure family of the Uniodeæ in the American Journal of Science, by Mr. Barnes, has equally facilitated the inquiries of the student, and elevated our scientific reputation. The marine mollusca have been, with the exception of the observations of Lesueur, almost entirely neglected by our naturalists. We know of no department in which more interesting discoveries are to be made, or which would secure a more honorable distinction to the young naturalist than the investigation of these curiously organized beings.

Having thus passed in rapid review the whole kingdom of living nature, we should consider our remarks as incomplete unless we adverted to those extinct animals whose study has received a new impulse from the sublime genius of Cuvier. The great abundance of the relics of beings which have now

perished from the face of the earth, early attracted the attention of the first explorers of this country. The most remarkable for its size is the Mastodon, which has been found as far north as the 50th degree of north latitude, and from the shores of the Atlantic to the great lakes. Hitherto but one species has been found.

The remains of another, but very different quadruped, an account of which was published by Mr. Jefferson, were described and figured in the fourth volume of the Transactions of the American Philosophical Society. The Megalonyx, as it has been happily named, respecting whose habits we can only form vague conjectures, was furnished with tremendous organs of defence and attack. Very recently the bones of the Megatherium or gigantic Sloth of South America, has been discovered in the neighbourhood of Savannah, and the industry and talents of our associate, Mr. Cooper, has enabled him to determine in a positive manner, their identity with the South American species. For our acquaintance with other extinct mammalia, we are

indebted to Dr. Wistar, for two new species of the genus *Bos*; and to Dr. Harlan for one of the Elephant, Tapir, Deer, and a gigantic *Manatus* or Sea Cow from the eastern shore of Maryland.

We are not aware that any *Ornitholites* or remains of birds, have yet been discovered in our country. Specimens have been presented to the Lyceum, from the sandstone of Nyack in the vicinity of this city, which, although much comminuted, were evidently the bones of birds. The circumstances under which they were found, and their appearance, led to a belief that they had been fortuitously deposited in open fissures of the rock. The Reptiles, from some cause to us inexplicable, have rarely been found in a fossil state. The greater part of those discovered within a few years belong to the class of marine reptiles, and have but a remote analogy with any of the present living species. Among these we may distinguish the *Saurocephalus* of Dr. Harlan, and the Monitor, described by Dr. Mitchill, from the tertiary formation of New Jersey.

Many parts of our country present ex-

tensive deposits of fossil fishes. A remarkable locality of this kind is to be found almost in the neighbourhood of this city. Let us hope that some of our naturalists will soon favour the public with their observations on this extensive deposit. All the specimens which we have examined, whether from Westfield or this latter deposit, are very closely allied to the genus *Lepisosteus* of Lacepede.

No region of the globe presents a greater number or variety of the remains of invertebrated animals, than our own. So numerous and varied are these relics, that the bare enumeration of those only which are already known, would occupy more space than the limits assigned to this discourse would admit. The investigation of these organic relics will amply repay the curious inquirer.

Having thus in a summary manner terminated this sketch of the progress made in the Natural Sciences by our countrymen during the few last years, it remains to be seen how far the government has extended its patronage towards these objects. We

would here take occasion to remark that, although these expeditions were evidently connected with national objects, yet it is not a little singular to observe with how much seeming coolness or neglect the result of these arduous and meritorious labors have been received by the government.

From the time that the celebrated expedition of Lewis and Clarke was planned, under the administration of the venerable patriarch of American Natural History, we believe that no president has deemed it worthy of his high station, or due to the people by whom he was elevated, to project expeditions for the purpose of bringing to light the hidden riches of the country. While Mr. Jefferson conceived the labors of Lewis and Clarke of sufficient importance to make them the subject of a special message, no president has deemed the subsequent expeditions worthy of even a passing notice in their voluminous annual messages. To the late Secretary of War are we indebted for our extended acquaintance with the various products of the territories in the north and in the west. Under his

auspices were projected, and to his liberal views are to be ascribed, the various expeditions which we now propose to notice.

The travels of Hennepin, Hearne, M'Kensie, and more recently those of Lewis and Clarke, and Pike, had thrown much light on the history of the Indian tribes, their manners, customs, and religion; and some progress had been made in determining geographical outlines and boundaries. The natural productions, antiquities, &c. had been almost entirely neglected, and it was to supply this deficiency that an *Expedition through the North Western regions of the United States* was proposed by Governor Cass, and warmly seconded and patronized by the Secretary of War. A Mineralogist (Mr. Schoolcraft) was attached to the party. Leaving Detroit, the party coasted in canoes along the southern shores of Lakes Huron and Superior, ascended the St. Louis, and by a short portage of six miles entered into Sandy Lake. This is one of the many tributaries of the Mississippi, from which it is but two miles distant. The party then ascended the Mississippi to Cassina Lake, which terminated their journey in that di-

rection. By observation, the latitude of Cassina Lake was determined to be in $47^{\circ} 38'$ N. Lat. Descending the Mississippi to the mouth of the Ouisconsin, a distance of one thousand miles, they ascended the latter river to a small portage of one mile, which brought them to Fox river, emptying into Green Bay. During the rainy season canoes are enabled to pass from one river to another, thus rendering the navigation complete. The expedition here separated into two parties, one of which proceeded along the shores of Green Bay to Makinaw, whilst the other coasted along the southern and eastern shores of Lake Michigan, which was carefully examined and explored. The parties united at Makinaw, and returned through Lakes Huron and Erie to Detroit; having thus performed a difficult and fatiguing journey of four thousand miles. Numerous observations on Geology and Zoology are scattered through the work, and the notices of the various Indian tribes bear honorable testimony to the industry and sagacity of the journalist, Mr. Schoolcraft.

In 1823 appeared an *Account of an Expedition to the Rocky Mountains, performed in*

the years 1819–20, under the command of Major Long. This was, perhaps, the best appointed exploring party sent out by the government, and in the result of its labors amply repaid the attention bestowed upon its equipment. Mr. Say was appointed Zoologist, Mr. Jessup, Mineralogist. Dr. Baldwin, and after his decease Dr. James, was appointed Botanist and Geologist; Messrs. Peale and Seymour as assistant Naturalists; in short, no means were spared to render the expedition as complete as possible, and a small escort of soldiers gave additional security to the enterprize.

The party, consisting of twenty persons, wintered at Council Bluff in $41^{\circ} 25'$ N. Lat. Leaving their winter quarters in the early part of June, and following the course of the La Platte, a tributary of the Missouri, they reached the Rocky Mountains in thirty days. The country through which they passed was one continued barren plain, with here and there isolated mountain masses, rising to the height of 7–800 feet, and composed of horizontal alternate strata of secondary sandstone and breccia. The soil is almost universally an arid, sterile

sand, and the whole region was aptly designated by the travellers as the "Great American Desert." The Rocky Mountains were ascertained to be primitive, and the point ascended by the party was 11,500 feet high. After devoting a few days to the examination of these mountains, they proceeded in a southerly direction until they struck the sources of the great Arkansaw river. Here the expedition separated into two detachments, the one following its course eastwardly, and the other proceeded more to the south, until they fell in with the River Canadian. Both parties suffered much from hunger, fatigue, and exposure; to which was superadded the desertion of two of their soldiers, carrying off with them the personal baggage, and what was of more importance, many of the manuscripts, notes, and observations of the naturalists. To those unacquainted with the nature of the rivers in these regions, and to whom a passage on them would seem unaccompanied with much risk or fatigue, it may be necessary to state that during the month of August one of the parties travelled five hundred miles in the dry bed of the river Canadian. In many places

this river was 1400 yards wide, and yet no running water was to be seen in all this distance, either in the river or its large tributaries, except in one or two instances, where it had evidently been occasioned by recent rains, and extended but a mile or two, when it disappeared. The thermometer was usually from 97–100°, and the torment of noxious insects was added to the other inconveniences attending the course of this river, which is estimated to be one thousand miles in length, from its source to its confluence with the Arkansaw. The collections made by this expedition were numerous and important. More than sixty new or rare animals, and several hundred insects were added to the Fauna, and many interesting plants to the Flora of the United States. The minerals and organic remains were extremely interesting, and the zoological notices which are scattered through the work, highly important. The naturalist will regret that these were not assembled together in an Appendix, or published in a separate form.

In 1824 appeared a *Narrative of an Expedition to the Source of the St. Peter's River, &c.* under the command of the same skilful and

scientific officer who had directed the expedition to the Rocky Mountains. Its objects were to explore that district included between the Mississippi, Missouri, and the northern boundary of the United States. The naturalists attached to the party were Mr. Say as Zoologist, and Mr. Keating as Mineralogist, and Geologist. Leaving Chicago, at the southern extremity of Lake Michigan, the party proceeded westerly, across the country watered by the Rock River and its tributaries to Prairie du Chien, on the Mississippi. Ascending this river to the mouth of the St. Peter, they ascended this latter three hundred and twenty-five miles, to its source in the Bigstone Lake. Within three miles of this lake they came to the shores of Lake Travers, the principal source of the Red river, which flows into Lake Winnipeck. We have thus within a small space, the sources of rivers which empty severally into the St. Lawrence, Hudson's Bay, and the Gulf of Mexico. Contrary to what might have been anticipated from such an elevated region, it is full of marshes, quagmires, and standing pools; through which the streams lazily

wind their way, as if hesitating in what direction to discharge their waters; whether to mingle with arctic ice, or to empty themselves into intertropical seas. Here, two noble streams take their rise from nearly the same source, one of which empties at a distance of twelve hundred miles into Hudson's Bay, at the 57th parallel of latitude; and the other, after travelling nearly three thousand miles, is discharged in the latitude of 29° into the Gulf of Mexico. The party descended Red River to Lake Winnipeck, and travelled through a succession of streams and lakes, of which the Lake of the Woods, Rainy Lake, &c. are the most important. They passed over the height of land which divides the valley of Hudson's Bay from the valley of the St. Lawrence, and entered Lake Superior near Fort William. They returned to Sault St. Marie, coasting along the northern shore of that noble inland sea. Valuable contributions to our Zoology and Geology were the consequences of this expedition.

In the following year Mr. Schoolcraft published his *Travels in the central portions of the Mississippi valley*, performed under the aus-

pices of government in 1821. Much of the work is dedicated to inquiries respecting the aboriginal population, but much valuable geological information is also contained in the volume. The district of the lead mines was again examined, and his former observations, which had been misconceived and controverted by some geologists, were now fully confirmed and verified.

We have been thus minute in pointing out the several routes of these various expeditions, that we may be enabled at a glance to ascertain what particular districts have been examined with a view to their natural products. It will also enable our naturalists more readily to select for future examination, such portions of the country as have not yet been fully explored.

While we thus gratefully state our obligations to the government, for the services they have rendered to the cause of science, let us hope that the same enlightened policy which has given this direction to a portion of the energies of the nation, may continue to operate. Let us hope that the present administration may be authorized to execute the various plans it has proposed,

that its patronage may be always liberally extended for the developement of the natural resources of the country, and finally, that no mistaken economy may be opposed to the prosperity of these sciences which are intimately connected with the best interests of the nation.

CONCLUSION.

In taking this rapid, and, I am sensible, imperfect review of the labors of our countrymen, several thoughts are naturally suggested. It will be perceived that without any greater incitement to exertion than what is derived from the laudable curiosity which prompts us to investigate the operations of nature, and with no other reward than the satisfaction derived from the investigations themselves, our naturalists have been industriously employed. In other countries, from the unequal distribution of property, it not unfrequently happens that large fortunes in the hands of private individuals are munificently expended for the encouragement of the Natural Sciences, and the fostering hand of government is liberally extended towards these objects. Splendid

establishments are founded and amply endowed, affording gratuitous instruction in the most minute branches, exhibiting brilliant prospects to the zealous student, and securing to the ripe scholar a secure and honorable retreat in his old age. In our own country, notwithstanding the peculiar constitution of society, which affords little leisure to the mere scholar, and the meagre recompense which awaits the student of science, yet Natural History has not failed to attract much attention from numerous votaries. Indeed a stronger evidence cannot be given of the interest which is taken in this study than the fact that numerous institutions for the cultivation of Natural History have been for many years in active operation in the United States, and every year adds several new associations to the list.

In Mineralogy more accuracy has been introduced, and analyses have been much improved, many new forms and combinations have been brought to light, and species hastily introduced have been speedily restored to their proper places. The loose and confused attempts at analysis, of which

some examples might be adduced, ten years ago, would not be tolerated at the present day. In Geology ample materials are daily accumulating for a complete history of our different formations, and the efforts of our geologists are unwearied in adding to the stock of our positive knowledge on this subject. Unbiased by the theories of European naturalists, they attach themselves exclusively to the study of the nature, arrangement, and connection of the different strata without attempting to seek for proofs of their identity with similar formations in Europe. The Botany of our country has been carefully studied, and although the attempts hitherto made to introduce the natural orders in preference to the Linnean arrangement, have failed of success, yet there is every reason to anticipate that ere long our botanists will generally adopt this only philosophical mode of studying the vegetable kingdom. In Zoology, from the peculiarity of our situation, naturalists have been more occupied in discovering and describing new species, than in investigating the natural affinities and relations of beings, the chief end of all zoological

studies. Indeed it is but natural to expect that more attention should be given to the examination of new species, than to a rigid criticism of genera. A knowledge of the former is doubtless of great importance, but the latter will enable us to detect the delicate affinities by which the different classes of organized beings are approximated, if not brought into absolute contact. We are aware that the idea of a chain of beings has been ridiculed as a philosophical reverie, but the more this question is examined with the light afforded by modern observation, the firmer will this opinion be established. Already we hear the terms, "natural series" "annectant groups" "regular series," and other expressions which mark the first glimmerings of light on this hitherto obscure subject. And when we reflect that these affinities have been for the most part drawn from external and obvious characters, that we have yet much to learn from the internal anatomy, that new species are continually discovered which connect hitherto separate genera, and finally, that every day brings with it the discovery of some extinct animal, whose struc-

ture varies more or less from those of any living being, we are insensibly led to admit that the idea of a chain of beings is neither visionary nor unphilosophical.

As naturalists we have much reason to be satisfied with our peculiar position. Placed on a comparatively virgin soil, with new forms and objects constantly presented to our view, suggesting new trains of thought, and giving rise to new associations, we are more highly favored than the naturalists of older countries. As pioneers in the Natural History of the United States, reputation and after-fame, those powerful incentives to active and honorable exertion, is more immediately within our reach than it will be to the numerous naturalists who shall but tread in our footsteps. With such incentives before us, let us apply ourselves diligently to the work,—

——dum loquimur, fugerit invida aetas.

In another point of view our situation offers some striking advantages. Removed as we are, from the scenes of those rivalries and contentions, which unfortunately too often intrude even upon the peaceful

domains of science, where unworthy national prejudices are sometimes associated with private jealousies, we are enabled to examine controverted points with coolness and impartiality. The remoteness of our situation supplies the place of time, and we may be supposed to decide between the conflicting opinions of European naturalists, with the same justice and impartiality as if we were removed from them by intervening centuries.

APPENDIX.



NOTE A—Page 24.

Opportunities for the study of the geology of this island are frequently presented by the cutting of new streets, and the removal of lofty eminences, which formerly might have been conspicuous land marks. In connection with the geological structure of this island, we may inquire if the limestone of Kingsbridge is associated with the great range of granular limestone in the western part of Massachusetts, as has been conjectured by Dewey and others. This derives probability from the fact that this formation appears along the shores of the Hudson at various places; as Dobb's Ferry, Sing Sing, Verplanck's Point, to the distance of forty miles north of this city. Are our geologists aware of the existence of serpentine *in situ* on this island, or that Paulus Hook rests on gneiss, or have they ascertained the nature of the rock forming Robins reef in this harbor? These questions are asked because no positive information has, as yet, been afforded respecting these subjects by any of our geologists.

NOTE B—Page 28.

This survey was performed under the direction, and at the expense, of Stephen Van Rensselaer, of Albany, a gentleman whose public spirit is only equalled by his public services; and whose ample fortune is honorably devoted to the interests of science, and the intellectual improvement of the rising generation.

NOTE C—Page 34.

The *Lyceum of Natural History* in this city, was in its origin a private association of young men, who held occasional meetings in one of the lecture rooms of the College of Physicians. Incorporated by an act of the Legislature in 1818, and furnished through the liberality of the Common Council with a suite of apartments in the New-York Institution, it has from that period been steadily though silently, increasing in usefulness and respectability. An extensive cabinet has been formed, which at the present moment contains nearly three thousand mineral species and varieties. No collection in this country is so rich in the department of Herpetology and Ichthyology. It contains more than five hundred species, and must ere long be a place for reference to all who wish to investigate these obscure classes of animals. In addition to the already extensive collections of fossils from various parts of Europe and America, the cabinet contains nearly the entire skeleton of the Mastodon, and large portions of the only North American specimen of the Megatherium hitherto discovered. A new department, that of comparative anatomy, has recently been established, which already contains many valuable preparations, and a series of skulls, nearly two hundred in number, from the different classes of the animal kingdom.

Every effort has been made to procure a suitable library, but from the expensive nature of the books required, with very limited success. It now contains about six hundred volumes, and the funds of the Military Philosophical Society have been generously presented by the members of that institution for its further increase. The Lyceum is also under pleasing obligations to Col. George Gibbs and Dr. David Hosack of this city, and to B. Dearborn, Esq. of *Boston*, for many valuable additions to the library; and the hope is indulged that its still limited extent needs only be known, to be remedied by the public spirit and liberality of our fellow townsmen.

For some time past, a naturalist has been employed in travelling through the country and exploring its various natural pro-

ducts. One of the members is now in Florida for a similar purpose; and as soon as the state of its funds will admit, it is proposed to employ suitable persons in exploring the regions west of the Mississippi. In connexion with this plan of elucidating the natural productions of our country, the Lyceum has commenced the publication of its transactions, of which the second volume is now in press, and will shortly appear. Of the character of this work it would be unbecoming in us to speak; the flattering reception it has met with from the naturalists of Europe has amply repaid for the labor and expense of publication.

NOTE D—Page 36.

It will be perceived that in our sketch of the department of botany, we have not mentioned those works which have already been noticed in the *North American Review*, or in the *Edinburgh Journal of Science*.

NOTE E—Page 33.

The assertion in the text will doubtless appear incredible to those who are acquainted with the multiplied observations which have been made upon the *U. ferox*, by some of our most accomplished naturalists. It is, nevertheless, founded on the following remarks of Cuvier. “D’après le temoignage de plusieurs voyageurs très-capables d’en juger et même d’après le dessin publié par M. *Choris*, j’ai tout lieu de croire que l’ours gris ou brun d’Amérique dont on a fait tant de recits exagérés, ne diffère point par l’espece, de nos ours bruns d’Europe.” *Recherches sur les Ossemens fossiles. Edit. 2d. Tome V. 2d partie p. 515. Paris, 1824.*

NOTE F—Page 35.

A ready access to the records of science renders it an easy task to separate the known from the unknown, to ascertain when we have opened a new path in science, or whether we are merely

pursuing the beaten track, and enables us to compare our own observations with those of our predecessors. The want of proper books to facilitate inquiries of a scientific nature has been long felt in this city; indeed it has frequently been asserted that New-York, in proportion to its population, contains fewer works in its public libraries than any other city in Europe or America. With a view of ascertaining the truth of this assertion, at least as far as our own country is concerned, we have taken some pains to procure the following comparative statement. Mr. Dobson of Philadelphia, Dr. Cohen of Baltimore, and Dr. Bass of Boston, will accept of our thanks for the ready politeness with which they have answered our inquiries. *New-York*, with a population of 170,000, possesses ten public libraries, containing 44,000 volumes; *Baltimore*, with a population of 70,000, has four public libraries, containing 30,000 volumes; *Philadelphia*, with a population of 160,000, possesses nineteen public libraries, containing 70,000 volumes; *Boston*, with a population of 60,000, possesses thirteen public libraries, containing 55,000 volumes.

NOTE G—Page 51.

This information is derived from our able and indefatigable associate, Captain Le Conte, who has devoted many years to the study of this department. He possesses detailed descriptions and accurate drawings of nearly all the number mentioned in the text, and supposes them to be distributed among the different orders in nearly the following proportions:

Coleoptera	2,000
Hemiptera	1,000
Lepidoptera	800
Diptera	3,000
Hymenoptera	1,500
Neuroptera	100
Aptera	500

NOTE H—Page 53.

The *M. angustidens*, which has been included among the North American fossil animals, on the authority of a tooth in a private collection in Philadelphia, is rather doubtful ; at least it has been examined by many of our naturalists, and referred by most of them to the *M. maximus*.

We will take this occasion to mention that there is reason to suspect that the Hippopotamus formerly existed in this hemisphere. A few months since Dr. Barlow, of Granville, (Massachusetts) presented to the Cabinet of the Lyceum a tooth which had been found a few feet beneath the surface, in some low lands in his neighborhood. Upon examination it was ascertained to be the right superior canine of the Hippopotamus. In another place, *Ann. Lyc.* vol. i. p. 98, we have alluded to the fact that many teeth of the same animal, in the Cabinet of the Lyceum, were obtained from the Falkland Islands.

NOTE I—Page 62.

The names of rivers, lakes, mountains, &c. in the less frequented parts of our country, which have so often been subjects of criticism, are generally literal translations of the ancient Indian names. It would certainly be preferable in all cases to retain the sonorous Indian appellations, where these can be ascertained. Ludicrous as these translated names appear, they are always descriptive, and evidently more appropriate than those adopted by an enlightened nation, whose voyages of discovery are filled with the names of mountains, rivers, &c. uniformly taken from the friends and relatives of the travellers. The names of the immediate patrons of the expedition are reserved for more conspicuous objects ; such as elevated peaks, prominent headlands, or capacious bays. The words New North, or New South, followed by the name of a petty district at home, is not unfrequently employed to designate tracts of country large enough to form con-

tinents. Our own city will long stand a monument of this ingenious system of nomenclature.

NOTE K—Page 66.

It is not unusual to hear some of our naturalists speak of the multiplication of genera as useless and unnecessary, but the evils originating from this source are not to be compared with those arising from the precipitate creation of new species. In the former case, genera, considered merely as artificial helps to the memory, (and they are nothing more) are made to subserve temporary purposes, and will ultimately find their proper place in a general systema. To those who view the "multiplication of genera as one of the misfortunes of modern science," we would recommend *inter alias*, the study of the genus *Ursus* as established by Linné, and the modifications it has received from subsequent naturalists. New nominal species, on the other hand, perplex the student, increase the labors of the critical naturalist, and render the study of natural history tedious and difficult. If it was generally understood that it is more meritorious to extinguish a single nominal species than to establish a dozen new ones, it would effectually check the present mania for making new species often on slight foundations. This also leads to an overweening anxiety to secure priority; and hence descriptions are liable to be drawn up in a crude and hasty manner, without reference to the co-ordinate characters.

It would much assist the cause of Natural Science if some general regulations could be adopted by which discoveries might be secured without infringing upon the rights of others, and a uniform system of nomenclature established. The Committee of Publication of the Lyceum have adopted for their own guidance the laws of nomenclature as collected by Decandolle in his *Theorie de la Botanique*, so far as they are applicable to the other departments. There are several points not settled in that paper which are now generally received by naturalists, and indeed are

obviously founded on principles of common sense and justice. Among these are,

1. Simple indications of species, merely to secure priority, should not be countenanced, although the specific name, if not otherwise objectionable, must be adopted.

2. As manuscript descriptions cannot be quoted, so the simple labelling of a specimen cannot be considered in the light of a prior claim. Yet courtesy requires that the original discoverer should be duly notified before publishing the species.

3. The claim of the original describer of a species is never lost, no matter through how many genera it may be successively transported.

4. Specific descriptions founded on single specimens are to be avoided as much as possible, and no description should be considered as complete and authentic, unless accompanied by figures, or what is preferable, a reference made to some collection in which the specimen is deposited.

5. No specific name should be noticed when the author has not himself seen the plant, animal, &c. but has drawn up his description from the relations of travellers.

6. Ignorance of the common systems, descriptions of species under two or more different names, the forming of new species from mere varieties of established and well known species, destroy all confidence in the authority of the describer, and of course render it unnecessary to quote his names or his descriptions, &c. &c.

These, and others of a similar character, although they may seem apparently unimportant in themselves, yet their due observance will tend materially to soften that exacerbation of feeling which should be confined to the political arena.

NOTE L—Page 67.

Unremitting efforts are made by modern naturalists to distribute the animal kingdom into groupes or families, allied by adventitious, and often highly artificial characters, derived from

form or habit. Although the minuteness into which these researches lead will elicit the discovery of many curious analogies, and open a wide field for ingenious speculations, yet they will not in themselves contribute towards the solution of the great problem of a connected series of beings. In some instances we may observe that the external form undergoes rapid and scarcely connected changes, while the order and relative importance of the several functions is but slightly varied. In others, the functions are observed to undergo gradual but ultimately important mutations, while the form remains comparatively unchanged. Hence it is to comparative anatomy, and its companion physiology, that we must look for the most important improvements and discoveries in zoological science. The great chain of being lies at present in an apparently confused heap; so that links which may possibly be far apart, seem to our partial and imperfect view, intimately connected if not in immediate contact.

FINIS.

