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Oct. 23. 53—3m

Clay's Speeches, &c.

CONTENTS—Biographical sketch of Mr. Clay. Speech on Manufactures—Line of the Perilous Bank charter—Agitation of the military force—Increase of the Navy—New Army—Emancipation of South America—Internal Improvement—Seminole War—Mission to South America—The Tariff—Spanish treaty—Greek revolution—American industry—Colonization of the negroes—Bank question—Address to Constituents—Speech at Lewisburgh; with a portrait in front—Price \$2 25.—The above work to be had of the publishers of this paper, at their Book Store, No. 97, Market-Street.

AN ADDRESS,

Delivered before The Delaware Academy of Natural Science, by Wm. Gibbons, M. D. President.

FELLOW-CITIZENS:

In discharge of the duties of my appointment, I proceed to give an imperfect sketch of some of the objects embraced by our Association.

Man, destitute of mental cultivation, has been aptly compared to a block of marble, in the state in which we find it when taken from the quarry. A good education accomplishes in the one case, what the chisel of a skilful artist performs in the other; and by a small acquaintance only with mankind, we are enabled to perceive the closeness of the analogy.

In whatever point of view we consider the human being—whether we regard his present comforts, his future prospects, the benefits to be derived from his civil and social relations; the exaltation of his nature, or his high destiny—we shall find that all is staked on the improvement of his mind.

In whatever region of the globe we discover him—whether a roaming Indian in the West, a wandering Arab in the East, shivering at the North, basking in the South, or an inhabitant of the more favored climes of Europe—void of intellectual improvement, he is still, wherever located, a savage; a creature surrounded by wants and wretchedness, or plunged into excesses; in his pleasures low and sensual; fierce in his desires, cruel in his resentments. Destitute, in this state, of a capacity for rational government, he either lives in anarchy, or crouches to a despot—ignorant and regardless of his moral and religious duties, the victim of imposture, or the slave of superstition.

But happily for our race, there is another side to this picture, where we see the barren waste transformed into a paradise, with the "tree of life," diffusing its beneficent influence through every compartment! For man, enlightened by the rays of science, and improved by intellectual exercise, displays an almost inexhaustible fund of resources, in subduing obstacles to supply his wants, and to multiply his comforts and his advantages. But it is when he adds VIRTUE to knowledge, that he ascends to the pinnacle of his allotment here, and presents himself to us a finished character; and it is when we view him in this position, that we can adopt the language of the Psalmist:—"Thou hast made him a little lower than the angels, and hast crowned him with glory and honour!"

To reach this exalted point on the scale of created beings, ought to be the primary object of each individual; and this Academy, being organized for the purpose of cultivating the NATURAL SCIENCES, as one of the means of attaining this elevation, I cheerfully embrace the present opportunity to inquire briefly, how far they may be made subservient to the noble design.

The natural sciences include within their extensive range, a vast number and variety of objects; every thing, in short, on this globe, and within it, both animate and inanimate. Hence, wherever the eye turns, or the foot treads, subjects intrude upon us, exciting our attention, or inviting our inquiry. In order to distinguish one thing from another, and facilitate the acquisition of knowledge, naturalists have found it indispensable to resort to some system—to divide, sub-divide, arrange, and form nomenclatures: and whatever cavillers may say upon this subject, the immense number and variety of objects, their equally various relations, with their similitudes—all point out the necessity of systematic arrangement: science destitute of this would be a chaos, "without form and void." But whilst advocating the necessity of systems, it ought not to be forgotten that to know the name of a thing merely, although essential to science, is scarcely, of itself, science. We may learn the names of animals, plants, and minerals; we may even acquire several languages, and have as many names for each article: but if we remain ignorant of their natures and uses, all our knowledge is little better than learned ignorance; and, although a digression, I may be allowed the remark, that our present modes of education, are too much limited to this kind of learning, and that after having passed through what is dignified with the name of a finished education, if we stop here,—if we do not "observe, read, and think" for ourselves, we shall be found almost destitute of real knowledge. We have only been put in possession of the tools with which to acquire, and if we do not handle them, they will rust on our hands, and our finished education will prove but of little benefit, either to ourselves or to the world.

The NATURAL SCIENCES, or those embraced by our institution, are arranged under the three great heads, denominated the ANIMAL, the VEGETABLE, and the MINERAL KINGDOMS. In the few remarks which I am to make on each of them, I shall begin with that which is the most simple and easy; ascending, in the progress of investigation, to that which is more complicated and difficult.

MINERALOGY treats of all the inorganic substances found on the surface of the earth, and within it. As far as our knowledge extends the number of simple bodies are few, but the manner in which the compounds are formed, and the properties of the ingredients are so multifarious, that they produce an almost infinite number of transformations, all differing either in their external characters, or internal qualities; and which often delight and surprise us with their variety and beauty. In these operations, the most splendid substances are sometimes formed from the most common and simple materials; thus the diamond, for a long time esteemed the most precious of gems, consists of nothing but charcoal and water.

This Science not only affords a wide scope for

pleasing and instructive research, but it administers largely to our wants and comforts. It is to it that Agriculture and the Arts are indebted for the most valuable of all metals the Iron; Commerce her Gold and Silver; Domestic Economy her Coal; and Medicine some of her most important remedies. Mineralogy, in this country, is in its infancy; the cultivation of it, therefore, opens a wide door to useful discovery, as well as to individual wealth. Of eight or nine hundred minerals described in our modern elementary works, more than four hundred have been already found in the United States; and there can be no doubt, that in a division of the earth, embracing such a great variety of soil and climate, several hundred more remain to be brought to light by the industry of future inquirers.

GEOLOGY, which may be considered as a branch of Mineralogy, points out the nature, structure and relative position of the different strata that compose the crust of the earth. Until late years this science has been pursued as a mere speculation; and writers have heaped together a mass of materials, deserving no better name than lumber, but which has been dignified with the title of "Theory of the Earth." The world has seen fifty of these theories, in little more than twice that number of years; and their authors, to adopt the language of a late writer on this subject, "have not scrupled to call in the aid of analogy, and thus by hypothesis after hypothesis, they analyse and recompound the vast globe of the earth, as if it were a piece of metal which the Chemist could fuse in his crucible!"

It is only by reasoning from what we know—from facts and observations, that we are enabled to form a rational system—to reason correctly we must make effects the guiding thread to their causes; but when it is considered that all the facts known respecting the earth are but few,—that we have not penetrated beyond the surface,—that we have not, in short, examined one ten thousandth part of the globe—we have a right to conclude, that any one who should pretend to have formed a true theory of the earth from such slender data, can have no better claim to our regard than the empiric who should undertake to illustrate the structure and functions of the internal parts of the body, by a mere inspection of the skin!

Yet, the little we do see of the earth proves to us that great revolutions have taken place. We find evidences of a general deluge—that the great deeps, as well as the great heights have been, in the language of Scripture, "broken up," and that a "chaos"—"without form and void"—has preceded the present order of things. Our data will not carry us much further than this; and when we attempt to encompass the earth, though but as a grain of sand in the universe, it escapes our feeble grasp, and we are reminded that "life is short, science long, opportunities of knowledge and experiments fallacious, and reasoning difficult." Even effects themselves are not always in proportion to their causes, as they appear to us; and whilst we are considering a part of what we see as the result of a terrible and universal convulsion of nature, causes, to appearance wholly inadequate, by their continued operation, age after age, may have had a large share in their production. Rains produce torrents that carry mountains down into the valleys; and volcanoes raise valleys into mountains. The action of the air itself converts solid rocks into powder; and the operation of fire changes the finest dust into solid masses. Vast accumulations of snow and ice, give rise to floods that sweep every thing away in their course; earthquakes swallow up cities, and alter the face of whole tracts of countries; madrepore and coral, worms so small as almost to elude the sight, exert their plastic powers and raise islands and mountains from the bottom of the sea, and force it upon the land; whilst the recrements of animal and vegetable bodies elevate grounds where the ocean had rolled its waves. "In this ebb and flow of existence," to use the words of a late writer, "we float along like the light and unsteady leaves which are borne, heaved aloft, hurried on, and swallowed up by one and the same billow. How then should we hope to form a conception of the unmeasured chain of revolutions which our globe may have undergone? We walk upon the circle of anterior worlds, but can we compute their number? the lapse of ages has heaped up ruins upon ruins; at every step we tread on monuments, upon which the hand of nature has engraved the history of the globe, but the language is couched in hieroglyphical symbols, the key to which shall never, perhaps, be found."

Leaving theorists to their fruitless speculations, let us attend to the facts which geological investigation brings to our knowledge. By thus making of geology a practical science, it is capable of being applied to a highly useful purpose. It is by pursuing this course, that it has become a guiding thread to the discovery of coal and many of the metals; for the nature, in the location and deposition of these substances, has followed certain fixed laws, which geology reveals to us: Thus we find a certain and constant relation to exist between substances on the surface of the earth, or within our immediate observation, and those which she has secreted within it. An ignorance of these geological facts has often given rise to much fruitless labor and expense, in searching for minerals, where it was impossible that they could exist. It is thus that nature, not only enlists our pleasures, but our interests in the study of her works.

Geology also introduces us to a partial, but highly interesting, acquaintance with the antediluvian world. Impressions of plants, more true than from the pencil of the best artist, are found upon solid substances. Here the order of nature is reversed, for those discovered in the north, are copies of such as now grow only in the torrid zone, and vice versa. The remains of various species of animals have also

been found, unlike any now known to exist on our modern globe; to which may be added part of a skeleton lately discovered on the banks of the Mississippi river, belonging to one of the Crocodilla race, computed at 130 or 140 feet in length. Add to this, great numbers of shells and fish, or impressions, in, imbedded in rocks and other substances: some appear, says the narrator, "to have been forcibly and suddenly enveloped in the substances which contain their impressions, and we still perceive the violent and convulsive contortions, into which those animals had thrown themselves, to the terrible catastrophe of which they are the monuments."

In passing from the Mineral to the VEGETABLE kingdom, we step over a chasm which must, for ever remain: the two kingdoms never can approximate; between organic and inorganic bodies there is no affinity. In entering on the study of plants, we discover a new fund of pleasing instructions; a wide field for the exercise of mind,—a fountain of intellectual enjoyment. But the vegetable world has other claims to our consideration: a thousand wants and comforts are supplied from it; and the Arts, and Manufactures, Agriculture and Medicine, are alike largely indebted to Botanical knowledge for their present advancement, and much of their further acquaintance with this interesting branch of Natural History.

Too many, after encompassing the technical part of Botanical science, rest satisfied with their attainments, although they have only arrived at the threshold of the science. Allow me, therefore, to urge the importance of extending your enquiries to the general structure, the physiology, the uses, the diseases, and (if I may be allowed the term) the instincts of plants; and also to their peculiar and admirable adaptation, as well to the supply of their own wants, as of the wants of the animal kingdom. When, in the germination of seeds, we uniformly see the part that is to form the root, in every position of the seed, descend into the earth, whilst the pumula, or future stem, with equal certainty rise upwards; some seeds furnished with wings, to transport themselves, others having a thread by which they are some attached in suitable situations to vegetate; some plants depositing carefully their own seed in the ground, others possessing the power of scattering theirs to a distance—when we observe plants that require support putting forth tendrils, at the moment in which that support becomes necessary, and even turning quite round out of their course, to lay hold of a pole,—if growing in the water, supplied with spiral stalks, which extend and contract with the rise and fall of the stream, to avoid being arched,—others forming reservoirs of their leaves to secure a supply of moisture in a dry season,—closing their petals, some in the day, others in the night, or hanging their heads to defend the embryo plant from the heat, or the cold, one turning its back to the storm to preserve itself, others buoyed up by bladders of air and forming extensive fields of vegetation;—when we remark some plants furnished with long funnel-shaped flowers, in order to reserve their honey for certain tribes of birds or insects, which are supplied with tubes to extract it, whilst other plants are armed with thorns and prickles to defend themselves from destruction, and all varying their sensible qualities, corresponding to the different tastes and inclinations of the numerous tribes of animated nature,—when we contemplate these circumstances and relations, with an almost infinite number of others, equally striking, daily and hourly presenting themselves to the inquiring mind, they cannot fail to excite our admiration, and furnish demonstrable evidence of human contrivance, of design, wisdom, and of goodness, proceeding from an Infinite Intelligence, who has thus deigned to manifest Himself to His family, even in the lower works of creation!

If, at any time, we wish to extend our powers of perception, and take a closer view of the economy of nature, we may discover, by the microscope, a new creation. In the seeds and buds of plants, the future vegetable may be seen, with its flowers and fruits in miniature:

"The pulpy seern, ere it swells, contains
The oak's vast branches in its milky veins;
Grain within grain, successive harvests dwell,
And boundless forests slumber in a shell!"

Superstition, mingling with almost every subject, has not failed to find a place even amongst the beauties of the vegetable kingdom. The ancient Druids cropped the Mistletoe with a golden axe; the man-drake, it was formerly averred, screamed when pulled up, and the person who gathered it was said to sicken and die; hence, when wanted for medicine, it was customary to tie a dog to it, by the tail, and thus extract it from the earth by whipping the animal, which was supposed to suffer afterwards.—Hops, it is still believed by some, grow on Christmas night; and we are told by Darwin, that in England, bits of the dried root of Peony, rubbed smooth and strung, as sold under the name of amooth yene necklaces, and tied round the necks of children to facilitate the growth of their teeth. St. Anthony, of Padua, when the people would not hear him, preached to the fish and converted them, which was effected, it is presumed, by secretly conveying into the water, the Cocculus, or Indian berry, which has the property of intoxicating fish. These, with the tricks formerly played off with the Enchanter's Nightshade, the modern diving rod, and a thousand other superstitions that might be cited, are all of a kindred character, and ought to be kept in view as beacons to guard us against ignorance and prejudice, to stimulate us to the acquisition of useful knowledge, and the extension of the dominion of