

technical naturalists were such on account of their pursuing an analytic method. The pseudo-natural school decided on the affinities of organic types by their "physiognomy" or their *facies habit* and the like, reading nature with an artist's eye, and attaining opinions of systems without the trouble of much anatomical study. They protested against the strict adhesion to "technical" (or structural) characters, saying that they violate "natural affinities" oftener than support or express them. Thus their systems become physiognomical, and please the eye by their appearance, rather than the mind by their expression of exact structural relations; in accordance with this system, species were always well distinguished, and could not have been derived from common parents, but that nevertheless everything "runs together," and that the higher groupings are mainly "opinionative,"—in fact, that, although nature has a beautiful system, we do not yet understand it, and that it is "too soon to generalize." Perhaps this obscurity has its advantages, as it certainly shelters in its profundities any theory of creation its supporters may choose to adopt. Hence they might be called the *Anæsthetic* school, or the *Anæsthesiasts* (*αναισθησις*).

The *unnatural* school think that the way of determining the origin and relations of an object is to ascertain of what it is composed. This was to be accomplished by analysis of all its appearances, and an account taken of every character. In this way the structure is learned, and a system based on anatomy is established. As anatomical systems are unnatural, and anatomical characters very difficult to discover by the anæsthesiasts, they regard such systems with disfavor, although they admit that they constitute the only correct classification of bones, teeth, brains, etc. The analysts even find that species having very close specific relationships occasionally present different generic characters. This was proof positive to the Anæsthesiasts of the errors of the technical school. But it was still less to their credit that they laid stress on variations and monstrosities, which were mere accidents. The fact that the analyzers believed in the development of species, showed their systems to be unnatural.

The speaker did not take sides, but observed that, in order to ascertain the relations of a species, he usually examined it first.

Mr. THOMAS MEEHAN said he had recently read, in the published Proceedings of the American Philosophical Society, the report of a discussion between Professor Cope and Mr. Eli K. Price in regard to the Hypothesis of Evolution. Mr. Price appeared to lay much stress on the assumed fact that variations were rather the result of interference by art with the regular flow of natural laws, and that it was therefore unphilosophical to attempt to found any theory of evolution on the facts of variation.

For himself he might say, that no theory of development, so far

as he had been able to understand them, had satisfied his mind; but that there was a continual growth of form, wholly unaided by man or any external agency, he thought fully warranted by numerous facts. He believed that this natural and inherent growth force in relation to form, was greater than even some who believed they understood the laws governing evolution were disposed to admit. Not only intelligent minds like that of Mr. Price, but even evolutionists, like Professor Gray and Dr. Engleman—judging from the last edition of the *Manual of Botany*, seemed indisposed to allow great power to inherent change; for whenever a marked change occurred, and there happened to be distinct forms at each end of the line, we find the fact assumed that such change could only occur by outside influences. Thus we find in a recent notice of *Rubus neglectus* of Peck, the expression "hybrid?" Also in relation to the oaks *Quercus tridentata*, *Q. quinqueloba*, *Q. Leana*, *Q. heterophylla*, "probably some or all of them hybrid;" and so on in other instances.

He wished to claim no credit for any particular original discoveries, but thought it had fallen to his fortune perhaps as much as to that of any one, to remark that art both in the animal and vegetable world had had more credit awarded to it in the matter of change than it was entitled to. He had shown long ago in the *American Naturalist*, that even in the production of double flowers, usually deemed peculiarly the privilege of the florist, nature herself was the peer of the gardener. He had shown by direct evidence that some things had been found double in a wild state, and the great probability that the double forms of so many species of such a common thing as the Butter-cup (*Ranunculus*), and other weeds never cultivated, originated naturally in the same way; and in numerous papers and remarks before this institution, and in other places, he had shown that there was as great variation in those genera which had only one species in a given locality, as there are in the cases of the Oaks and Blackberries before referred to. At the present moment he remembered especially a short paper in the *American Naturalist* on the Ox-eye daisy (*Chrysanthemum leucanthemum*) and in the Proceedings of the Academy on "Variations in *Epigaea repens*." There are no "allied species" here to hybridize with. They are far out of the way of cultivation. Neither gardening nor hybridization can by any possibility have anything to do with the great variations we see.

But he would now offer another contribution to this class of facts. He had journeyed last summer several hundred miles through the Rocky Mountains of Colorado, and had noted remarkable variations in the only species of Oak in that region, *Quercus Douglassii*, or *Q. Neo-mexicana* of some authors. The first plants he found of this occupied large clumps in flat open spaces, and grew only about three feet high. He felt sure he had several species, and collected specimens accordingly. One form

had the leaves so much like the *Quercus Cerris* of Europe, that branches of the two mixed together could scarcely be separated; others came near in their resemblance the European *Quercus robur*; and again some near *Q. alba* of our own country. Did these species grow there, we should assuredly have the remark by the esteemed author of the "Manual." "Probably a hybrid between *Q. cerris* and *Q. alba*." It was only after many successive days of acquaintance with it, during which it had ranged from a low bush to a small tree—from leaves deeply lobed to leaves almost entire—from leaves of a deep shining green to leaves of a glaucous gray—trees with fruit pretty well matured, to others only just commencing to set their fruit—from long to short pedunculated, elongated to sub-rounded fruit—and so on through other changes—that he was forced to the conclusion that he had but one species to deal with, and such he believed would be the conclusion of any careful botanist.

Whatever may be ultimately accepted as the correct theory of evolution, the fact of evolution so great as to produce forms equal to the most decided species could scarcely be disputed; and this, too, as such cases as this of *Quercus Douglassii* proved, entirely removed from the hand of art, or the agency of hybridization.

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MAY 28.

The President, Dr. RUSCHENBERGER, in the chair.

Thirty-six members present.

The following gentlemen were elected members of the academy: Jos. H. Ogden, Jos. E. Gillingham, D. S. Holman, J. W. Miller, P. P. Morris, and T. M. Drown, M.D.

Mons. E. Rivière, of Menton, France, was elected a correspondent.

On favorable report of the committees, the following papers were ordered to be printed.

Permission having been granted, Prof. COPP exhibited some vertebræ of a Plesiosauroid reptile and those of a smaller species, probably a *Clidastes*, which were found in close proximity near Sheridan, Kansas, by Joseph Savage, of Leavenworth. According to this gentleman, the vertebral column of the *Clidastes* was found immediately below that of the Plesiosauroid and in a reversed position, as though it had been swallowed by the latter or larger reptile. The largest vertebræ of the *Clidastes* were about three-quarters the length and one-fourth the diameter of those of the Plesiosauroid, and the animal must have furnished a large, or at least a long, mouthful for its captor. The bones of the *Clidastes*