

## A CENTURY OF SCIENTIFIC WORK.

EVERYONE interested in science is aware that the "Société de Physique et d'Histoire Naturelle de Genève" has won for itself an honoured place among the learned Societies of the Continent. Work of the highest interest and importance has been done by many of its ordinary members, and the list of its honorary members includes a very large number of the investigators who, in different parts of Europe, have contributed most effectually to scientific progress. Some time ago this excellent Society celebrated the hundredth anniversary of its foundation, and an interesting supplementary volume has now been issued in memory of the occasion. To this volume Dr. A. H. Wartmann contributes a sketch of the Society's history, and it may be worth while to note some of the facts he has recorded.

Nominally, the Society was founded in 1790. That is, several men of science in Geneva agreed in that year to unite in forming it. As a matter of fact, however, the first official meeting was not held until 1791. The Society was called at first the "Société des Naturalistes Genevois," and there were eight members, who met in each other's houses on the second and fourth Thursday of every month. The President was M. Gosse. A secretary and a treasurer were appointed; the annual subscription was fixed at two crowns; and an effort was made to obtain copies of the scientific journals of the time. It was felt that there ought to be more than eight members, so the honour of membership was offered to several men of science, by the majority of whom it was accepted. Foreign men of science who happened to be passing through Geneva were invited by the President to attend the meetings, and some of them were made honorary members. In the course of the first year M. Jurine made a present of his herbarium to the Society; this was the origin of its collections. One of the first objects of the Society was the creation of a botanic garden, and a site was chosen which has ever since been retained. M. Micheli presented a hot-house; exotic plants and seeds were obtained; and courses of instruction in botany were given under the Society's auspices by MM. Micheli and de Saussure.

The most eminent representative of science in Geneva at this time was Charles Bonnet. He was asked to become the patron or Honorary President of the new Society. He would have preferred the position of *confère*, but ended by complying with the request. He died in 1793, bequeathing to the Society 300 crowns, which provided for the maintenance of a gardener and other necessary expenses in the botanic garden.

The activity of the young Society was shown in a series of labours in the physical and natural sciences—labours of which an account has been given by Vaucher, one of the founders. The question of a diploma of reception was raised, and, after much consideration, a seal was prepared. This was abandoned in 1819 in favour of a seal engraved by Bovy.

In 1792 the Society changed its name to "Société Genevoise d'Histoire Naturelle." Shortly afterwards the name by which the Society is still known was adopted.

Under an impulse due to M. d'Albert Henri Gosse, two other scientific Societies were founded in Geneva. One, created in 1803, went back to the name of "Société des Naturalistes." In 1829 it was merged in the "Société de Physique et d'Histoire Naturelle," in whose archives its papers are preserved. Many of these, according to M. Wartmann, are of some importance. The other Society was the "Société Helvétique des Sciences Naturelles," founded in 1815. Of this Society, which has continued to flourish, the "Société de Physique" may be regarded as the Genevese section. When it met at Geneva, in 1866, the two Societies united in the ceremony at the unveiling of a monument to M. Gosse.

When the number of members increased, a fixed place of meeting became necessary. They met for some years at the Société des Arts, then (from 1826) at the Academic Museum, and afterwards (from 1872) in the hall of the Société des Arts. The times of meeting were changed from the second and fourth to the first and third Thursday of every month; and in 1834 it was decided that a meeting should be held only on the first Thursday of the month.

The President holds office for a year. A Vice-President is also appointed. From 1858 to 1879 the President entered upon his duties in July, and in the following June he was succeeded by the Vice-President. Now the President and Vice-President assume office at the beginning of the year.

The Society consists of active members, emeritus members,

and honorary members. The former—limited in 1822 to forty, in 1863 to fifty, in 1878 to sixty—reside in the canton. The emeritus members are members who have ceased to take an active part in the Society's work. The honorary members—limited in 1859 to seventy, in 1878 to sixty—are chosen from among men of science in Switzerland or any other part of the world. There are also "associés libres," who cannot be appointed before the age of twenty-five.

Although women do not habitually attend the meetings, there is nothing to prevent them from being connected with the Society. Mrs. Somerville was an honorary member from 1834 to 1873.

Very many communications submitted to the Society have marked important stages in the development of science. At first some of the communications used to appear in foreign periodicals or in the *Bibliothèque Britannique*, which afterwards became the *Bibliothèque Universelle*. In 1820 it was decided that a collection of Memoirs should be issued, and that the task of selecting the papers should be intrusted to a Committee of Publication. This Committee still exists, its secretary being known as the corresponding secretary. The first volume, consisting of two numbers, appeared in 1821 and 1822, and in 1890 appeared the second part of the thirtieth volume. The publication of the Memoirs, many of which are accompanied with plates, is very costly, but sometimes the writers bear the whole or a part of the expense. A *Bulletin*, presenting a *résumé* of the proceedings, has been issued regularly since 1884, and an account has also been given since 1883 in the *Archives des Sciences Physiques et Naturelles*.

The funds of the Society are derived from subscriptions, gifts, and bequests. At first the amount of the annual subscription varied in accordance with the Society's needs, but in 1860 it was fixed at twenty francs. From 1829 to 1854 the Society was officially recognized by the State as the "Société Cantonale de Physique et d'Histoire Naturelle," and received an annual subsidy; but during the last thirty-eight years there has been no relation of this kind between the Society and the Government. A sum of 1200 francs is paid annually by the Administrative Council for the books and memoirs with which the Society enriches the public library of Geneva.

The various collections possessed by the Society have been given partly to the Museum of Natural History, partly to the Botanic "Conservatoire." A prize of 500 francs is offered every five years for the best essay on a genus or family of plants. The sum of 2400 francs which enables this prize to be offered was left to the Society for the purpose in 1841 by A. P. de Candolle. Since 1886 the Society has reserved for itself, at a cost of 600 francs per annum, a place at the Zoological Laboratory of Villefranche, and the person who is to be allowed to take advantage of it is chosen in accordance with a fixed set of rules.

The Society now includes fifty-four ordinary members, four emeritus members, fifty honorary members, and thirty-one *associés libres*. Among the honorary members are many of the most eminent men of science in Europe and America.

## THE TRANSMISSION OF ACQUIRED CHARACTERS THROUGH HEREDITY.

THE bearing of insects upon this subject is very clearly brought out by Prof. C. V. Riley in a recently published paper on "Some Interrelations of Plants and Insects" read before the Biological Society of Washington. After dealing with the facts connected with the insects associated with the interesting plants of the genus *Yucca* and the pollination of their flowers by the *Yucca* Moth, and touching briefly upon certain aspects of fig-capricification, he makes the following remarks:—

"Now, when it comes to the bearing which the history of these little moths has upon some of the larger questions that are now concerning naturalists (for instance, the transmission of acquired characters, or the origin, development, and nature of the intelligence displayed by the lower animals), broad fields of interesting opinion and conclusion open up before us—fields that cannot possibly be explored without trenching too much upon your time. I will close, therefore, with a few summary expressions of individual opinion, without attempting to elaborate the reasons in detail, and with the object of eliciting further discussion, which is one of the objects of the paper. My first conviction is that insect life and development give no

countenance to the Weissman school, which denies the transmission of functionally acquired characters, but that, on the contrary, they furnish the strongest refutation of the views urged by Weissman and his followers. The little moths of which I have been speaking, and indeed the great majority of insects—all, in fact, except the truly social species—perform their humble parts in the economy of nature without teaching or example, for they are, for the most part, born orphans, and without relatives having experience to communicate. The progeny of each year begins its independent cycle anew. Yet every individual performs more or less perfectly its allotted part, as did its ancestors for generation after generation. The correct view of the matter, and one which completely refutes the more common idea of the fixity of instinct, is that a certain number of individuals are, in point of fact, constantly departing from the lines of action and variation most useful to the species, and that these are the individuals which fail to perpetuate their kind and become eliminated through the general law of natural selection.

"Whether these actions be purely unconscious and automatic or more or less intelligent and conscious, does not alter the fact that they are necessarily inherited. The habits and qualities that have been acquired by the individuals of each generation could have become fixed in no other way than through heredity. Many of these acts, which older naturalists explained by that evasive word "instinctive," may be the mere unconscious outcome of organization, comparable to vegetative growth; but insects exhibit all degrees of intelligence in their habits and actions, and they perform acts which, however voluntary and, as I believe, conscious in many cases, as in that of our Yucca Moth, could not be performed were the tendency not inherited. Every larvæ which spins or constructs a hibernaculum, or a cocoon in which to undergo its transformations, exemplifies the potent power of heredity in transmitting acquired peculiarities. A hundred species of parasitic larvæ, e.g., of the family Braconidae, which in themselves are almost or quite indistinguishable from one another structurally, will nevertheless construct a hundred distinctive cocoons—differing in form, in texture, in colour and in marking—each characteristic of its own species, and in many instances showing remarkable architectural peculiarities. These are purely mechanical structures, and can have little or nothing to do with the mere organization or form or structure of the larva, but they illustrate in the most convincing manner the fact that the tendency to construct, and the power to construct, the cocoon after some definite plan, must be fixed by heredity, since there is no other way of accounting for it. This fact alone, which no one seems to have thought of in the discussion, should be sufficient to confound the advocates of the non-transmissibility of acquired characteristics.

"Thus, to my view, modification has gone on in the past, as it is going on at the present time, primarily through heredity in the insect world. I recognize the physical influence of environment; I recognize the effect of the interrelation of organisms; I recognize, even to a degree that few others do, the psychic influence, especially in higher organisms—the power of mind, will, effort, or the action of the individual as contradistinguished from the action of the environment; I recognize the influence of natural selection, properly limited; but above all, as making effective and as fixing and accumulating the various modifications due to these or whatever other influences, I recognize the power of heredity, without which only the first of the influences mentioned can be permanently operative."

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