

THE JOURNAL OF MORPHOLOGY—A
RECORD OF PROGRESS.

WE have before us the third and concluding part of the second volume of this excellent publication. It contains five papers (260 pages) with seventeen plates (with one exception folding ones) and fifty-four woodcuts. The illustrations are most admirable, and the plates, which bear the magic names of Werner and Winter, possess an exceptional charm. While all familiar with this Journal must admit that it has, from the first, taken high rank among its contemporaries, few will have been prepared for the magnificent display of the part now under review. With respect to its get up, the editors may well-nigh defy competition, so liberally have the publishers responded to their demands. Much that is proffered is truly American, in its revolutionary and highly sensational character; but, contrary to that which so often prevails, the startling deduction is based upon a solid foundation of fact, whereby the thing becomes tolerable, and the reader's attention is arrested. A refreshing thoroughness permeates the whole, and the work teems with originality.

The senior editor and Dr. W. Patten each contribute a short paper embodying "facts and conclusions . . . stated in advance," of papers to be published in full in forthcoming numbers of the Journal. It is in connection with these that the revolutionary element to which we have alluded is most marked; and the reader is worked into a tremor of enthusiasm by the following among other declarations:—

"The eyes (of certain leeches) are segmental in origin, and strictly homologous with the segmental sense-organ. . . . The only evidence of an eye is a single large visual cell, on either side of the head, without a trace of pigment investment. In view of these facts . . . we can no longer regard pigment as an essential element of the leech eye. It will not do to fall back on the hypothesis of degeneration; . . . the visual cells are here as perfectly developed as in the pigmented eyes, and the same is true of the optic nerves."

Again—

"The segmental sense-organs of the leech are identical with the lateral line organs of vertebrates," and "when we find strong grounds for thinking that the lateral line organs have served as the point of departure for the formation of gustatory, olfactory, and auditory organs, our suspicion in regard to the eyes no longer appears incredible."¹

The paper in which the above cited statements occur is entitled "Some New Facts about the Hirudinea," and the author defines these animals as "a group, characterized by the possession of *segmental* sense-organs on the first ring of every somite." Writing of the leeches in especial relation to the progressive development of sense-organs, he tells us that "nowhere is the transition from lower to higher sense-organs so perfectly illustrated as in the leech," and he then gives us the following remarkable passage:—

"*Branchelliopsis*, *Clepsine*, and *Hirudo* reveal all the intermediate steps, beginning with the purely tactile organ; then advancing to the compound organ, in which a few of the cells have been modified to serve the purpose of vision, while the rest have retained their primitive character; and finally, culminating after a long series of progressive encroachments—the visual elements increasing gradually at the expense of the tactile—in an organ in which the original function has been entirely suppressed and a new one substituted for it."

Again, we read—

"As the metameric arrangement of these sense-organs characterizes marine as well as fresh-water and land leeches, and as they everywhere agree in certain remarkable details of number, topography, and structure, I am led to believe that the

¹ Somewhat similar views have already been postulated, for the eye by Hill (*Brain*, 1888, p. 422), and for the taste organs by Beard (*Anat. Anz.* 1888, p. 879.)

diffuse or non-metameric arrangement, exemplified in *Nepheleis* and some other forms, has been secondarily acquired."

Dr. Patten's "*vorläufige*" is entitled "Segmental Sense-organs of Arthropods." His concluding remarks read as follows:—

"The ventral cord and brain of Arthropods is at first composed entirely of minute sense-organs, which in Scorpions have the same structure as the segmental ones at the base of the legs. On the lateral edge of each ganglion of the ventral cord of scorpions are two of these sense-organs, conspicuous on account of their size and dark colour. In each segment of the brain are similar but still larger ones. All these sense-organs are converted into the ganglion-cells of the brain and ventral cord."

The deductions above cited involve absorbing topics of contemporary research. We eagerly await the full papers and the discussions which they will raise, in the earnest hope (on a knowledge of that which has gone before) of an amicable settlement.

Prof. A. E. Dolbear contributes a paper on "The Organization of Atoms and Molecules," in reply to the senior editor's remarks upon "The Seat of Formative and Regenerative Energy," previously noticed in these pages. The author deals only incidentally with the biological aspects of the question; he claims that

"in late years chemists have adopted the term *Chemism* in place of chemical affinity, and have given to it a greater range of proclivities, finding no difference but one of degree between it and cohesion;—

that

"chemists have not attempted to give a physical explanation of the cohesion of atoms into molecules, but have stopped with chemism, as if it were an ultimate fact or property;—

while he attempts, as his chief object, to give

"a physical explanation of chemism or atomic cohesion, and to extend it to the building up of geometrical crystalline forms."

To this paper the editor adds some trite remarks, for which, in his modesty, he asks the reader's forbearance. The editor claims that the article in question "cannot be said to come strictly within the scope" of his journal. With that we cannot agree. The physicist's view of the nature of organic phenomena is very welcome, and we are of opinion that much good would result could we replace many a purely discursive biological article with one such as this, if only with a view to a more definite agreement with the physicist than at present exists, upon a sound basis for future work.

The papers which will attract most attention are those of Minot and Allis, upon the mammalian placenta, and the lateral line system in *Amia*, respectively. Each is a masterly monograph: the chief interest of the first-named centres in its revolutionary character; that of the last-named in its solidity and thoroughness. Prof. Minot deals in full only with man and the rabbit, and he proceeds at the outset to supplement previous work in matters of detail. He seeks to show that "the changes in the uterus during gestation" are "a prolonged and modified menstrual cycle," and that "the ovum has no power of initiating the development of a *decidua*, but only of modifying the menstrual process; hence pregnancy *can* begin only at a menstrual period." In discussing the views of others he is dogmatical but never disrespectful, and the following may well be cited in example:—

"We know positively scarcely more than that the maternal and foetal circulations are brought very close together in the placenta. We infer that there must be a transfer of nutritive material from one blood to the other. As to *what* material is transferred and *how*, we have only theories, but of them an abundance. Under these circumstances, the best beginning is undoubtedly a frank acknowledgment of our ignorance."

The author contends that "we are brought squarely to the conclusion that the foetal placenta is chorionic," and that "from this premise phylogenetic speculation must start." He tells us that, "so far as our present knowledge enables us to judge, the discoidal is probably the primitive placental type." With this we heartily agree, and it has always appeared to the writer of the present article that the same conclusion is, on the Balfourian hypothesis (from which Prof. Minot dissents) that both the yolk-sac and allantois were primitively concerned in rendering the chorion vascular, by far the most natural one warranted by the facts. The belief in the primitive nature of the diffuse placenta is, beyond doubt, largely attributable to its non-deciduous character. With Dr. Minot, we are opposed to Ryder's theory of the "origin of the discoidal placenta by constriction of the villous area of the zonyary placenta." We would rather reverse the order, and regard the zonyary type as transitional between the more primitive discoidal one and the more recent and modified diffuse cotyledonary and metadiscoidal varieties, regarding the replacement of the discoidal in the zonyary type as primarily due to extension consequent upon the complete withdrawal of the yolk-sac from the chorion. Under this hypothesis the simple nature of the villi of the diffuse placenta might well be considered secondary.

Dr. Minot's paper furnishes a moral which cannot be too often borne in mind, viz. that it is not necessary to look beyond the most familiar organisms for material for legitimate work: neither a "new body" nor "a hitherto undescribed organism" are indispensable to the building up of a reputation.

Mr. Allis's paper is one for which we have eagerly watched, it being (as our readers will be aware) the first of a promised series. The author maps and classifies the sense-organs of the head with minute accuracy, at the leading stages of growth. When he tells us that "as many as thirty-seven hundred" pores "were counted on the head of a single large specimen," some idea of the laboriousness of his task may be formed; and on finding that he has worked out the detailed relationships of the parts to the individual bones, that he has, in addition to working out their development, determined the limits of individual variation and taken count of abnormalities, it is clear that his labour is a labour of love. The thoroughness of his work and the beauty of his illustrations must be seen to be appreciated; and should he complete his task, maintaining the standard of excellence with which he has started, he will have merited the regard of biologists for all time. He has brought to light the surprising fact that many of the first formed openings of the cutaneous canal system fuse to form pores, and that the dendritic systems and groups of pores which, in the adult, replace these, arise to a large extent from their repeated dichotomous division.

The author deals neither with polemics nor generalities,¹ nor does he even allude to striking facts which his figures show, foreign to his immediate inquiry. Consideration of these is doubtless deferred. He deals incidentally with the neuro-epithelium of the spiracular cleft discovered by Wright; this he regards as a sense-organ, which was "regularly developed in the epidermal covering of the head along with the other organs of the infra-orbital line, but, lying near the edge of the spiracular cleft, it wandered into this cleft as it was closed." Indeed, it is upon this observation that the author's co-editor confessedly bases his belief in the migratory origin of the gustatory organs; and Mr. Allis's allied discovery that "the nasal pits are inclosed in the same way that the lateral canals are" will be welcomed with especial interest by embryologists of the hour.

We have often wondered that our American brethren should have been so tardy in working out the structure

and development of their native *rarissima*. Their Opossum and their Urodeles are now receiving attention, a beginning has been made with Lepidosteus, the Gymnophiona remain. Zoologists of the Old World could desire nothing better at the hands of their New World *confrères* than a series of exhaustive monographs upon the structure and development of the animals named, uniformly with the one now under review. A better model of conscientious work it would be difficult to produce.

G. B. H.

THE AUGUST PERSEIDS OF 1889.

THE moon being full on the morning of August 11, it was hardly to be expected that the Perseid meteors would exhibit a notable display this year. Apart, however, from the ill effect the moonlight must certainly have exercised upon the visible character of the shower, there is no doubt that the phenomenon has proved one of minor importance. I have never observed, during the previous twenty-two years, so scanty a fall of the August meteors.

I made observations on July 26, 27, 29, 30, 31, and August 3, for the express purpose of determining the radiants of early Perseids, but failed to secure an adequate number of paths to carry out that intention. In watches extending over eleven hours I counted 89 meteors, but not more than 6 of these could have been Perseids. It was evident that this system was very feebly represented. Yet in 1887 it formed a very distinct and fairly active display as early as July 19 and 22, and I have sometimes remarked decided traces of it in the second week of July. In 1878 and several other years I observed that the Perseids made a prominent shower towards the close of that month, and it was easy to find the position of its radiant on every clear night. But this has been quite impracticable in 1889, owing to the exceptional scarcity of meteors.

On August 7, 1889, I looked towards the eastern region of the firmament during the 2½ hours from 11½h. to 14h., and recorded 28 meteors only. Amongst these were 10 Perseids with a radiant point very sharply defined at 41° + 58°. They were rather small and traversed short paths; nearly all of them appeared near the centre from which they radiated. The shower was, however, of greatly inferior character to what was expected on a date so near the maximum. The ensuing nights were pretty clear, but in the brilliant moonlight meteoric apparitions were very infrequent. On August 10 only 8 Perseids were noticed in one hour before midnight.

My recent observations would seem to indicate that we have passed through a minimum of the August meteors.

The Aquarids which are generally very abundant at the end of July were also weakly displayed this year. I registered 6 of them between July 27 and August 3, from a radiant at 336° - 13°. Of the other streams which distinguish this epoch I saw several, the principal of them being a shower of Cepheids from 329° + 62° and of Cassiopeids from 8° + 52°.

W. F. DENNING.

NOTES.

WE print to-day the Report of the Committee appointed by the Treasury on the Scientific Collections at South Kensington under the control of the Science and Art Department. It is some seventeen years since the Duke of Devonshire's Commission recommended their formation, and it would seem now that something may really be done after so long a delay. The Committee, it will be seen, discuss both the question of a new building and that of the proper organization of such collections. The eminence of the members of the Committee adds great weight to their recommendations, and the Report has been very favourably received by the Press.

¹ He appears to have overlooked an important paper by Fritsch, in *Stzb. Berlin Akad.*, 1888, viii., p. 273.