have separated, either apparently or in reality, into four and sometimes even eight fragments. Could the presence of the male nucleus have by any chance escaped the notice of Zacharias? . . . In all the nematoids I have studied, I have nearly always ascertained the progressive elaboration of the female nucleus, whilst at the same time the male nucleus, which was visible at the various stages, was gradually developing. Then, again, in such species as the *Ascaris clavata*, where the equatorial division takes place, the ultimate nucleus of the egg is completed, as at the end of the ordinary kinesis.

In short, if the first mode exists, viz. the normal mode of Zacharias, it seems to me but to represent a special and, perhaps, an eventual mode of fecundation in the nematoids. Whether the fusion of the male and female nucleus takes place at the top of the egg, or later after their distinct elaboration, or lastly during the kinesis of segmentation, it matters little; at all events the fusion, in my opinion, does take place, and that is the essential point. I must, therefore, on this subject, maintain my former conclusions.

I shall be happy to put at the disposal of my learned colleagues, to whom the matter may be of interest, a number of preparations obtained from various nematoids.

---

4. *The Spermatogenesis of the Acarians and the Laws of Spermatogenesis in general.* *By* Professor Gilson.

This paper is but a very short abstract of a chapter of my work upon the spermatogenesis of the Arthropods, which is still in course of publication. The original paper would have been too long to read in French without exhausting your patience, but on the other hand I must claim your indulgence for this English abstract.

The spermatozoa of this group of Arthropods are not yet very much known.

Leydig and Pagenstecher give only a few drawings and a very short description of them. Claparède and Henking have also studied the spermatozoa of Atax, Tetranychus, and Trombidium. But these are—according to their drawings—thoroughly different from those we have found in the Gamasids and the Ixodids. These bodies show, however, very interesting features in their constitution and genesis.

The multiplication of the mother-cells, which give origin to the spermatic cells, takes place by binary segmentation. The spermatic cell contains a large nucleus, in which a little nucleolus is visible. In this are enclosed the bits of nucleinic substance (or chromatin) perfectly colourable by the methyl-green.

According to the appellation proposed by Professor Carnoy for that kind of productions this nucleolus is to be called in French 'nucléole-noyau,' and could be called in English 'nucleo-nucleolus,' or nucleus-shaped nucleolus.

This cell grows longer into a rather thick spindle. The nucleus takes also a lengthened shape. But the nucleus-shaped nucleolus remains intact in form and in internal structure.

Under the membrane of the cells appear longitudinal or transversal lines, according to the species. Those details depend on the external layer of the protoplasmic reticle which is contiguous to the membrane. In the same time the lengthened true nucleus becomes incrusted with a hyalin substance.

In several species the nucleus-shaped nucleolus pierces the cell's membrane, and remains entangled in the same and externally prominent.

The spermatozoa are free; ordinarily unmoved in the male; animated with light contractions in the female.

Many might consider that the spermatogenesis of those animals I have just shortly described is a deviation from what they would call *the general law of spermatogenesis*. As for me I rather think that there is no general law existing for the spermatogenesis.

The phenomena of the genesis and the differentiation of the spermatic cell are, indeed, extraordinarily diversified—to such a point that, in order to get them together in a single formula, it would be necessary to say: *the development of spermatozoa includes several different processes of cellular genesis and differentiation.*

In order to render this formula more determinate I consider it impossible, in the actual state of science, to add to it any note concerning either the genesis or the differentiation of the spermatic cell, *without restraining its extension.* More specified, it would no more apply to *all the living* forms, and it would cease to be *general,* since nothing is more diversified than the alterations of that genesis and differentiation which were observed in the different degrees of the organic series.

But, such as I have expressed it, this formula, which can apply to every kind of cells, is not the synthesis of the facts observed in spermatogenesis. It is not a biological law, because a biological law is nothing other than the synthesis of the facts. So I may say that there is no general-law existing for spermatogenesis. There are no other general laws than these which regulate the genesis and the differentiation of every kind of cells; laws which still totally evade research, and are dependent on the inmost constitution of organised substance.

But no general law existing, it is evident, however, that after long comparative and conscientious analytic researches, one may make the synthesis of the facts, and look for special laws for the different groups of beings. It would be desirable that this synthetical work were made from a comparative cytological point of view, in order to avoid the false interpretations and the multiplication of useless terms. Let us add that it would be also desirable that, in the synthetical summaries, as well as in the statement of the researches, separate descriptions should be given of the facts belonging to the three periods of spermatogenesis, namely:—

The period of the multiplication of the mother-cells; the period of the differentiation of the spermatic cells; and the period of the different phenomena which follow the completion of the spermatozoon. The summary I have just made can be considered as being the special law for the *Gamasids* and the Ixodids, the only families of acarians I have studied up to this time.

---

5. *On the Nesting Habit of* Atypus Niger, *a Florida Spider.*

By Dr. McCook.

---

6. *On Cephalodiscus.* *By* S. F. Harmer.

---

7. *On some new types of Madreporarian Structure.*

By G. Herbert Fowler, *B.A., Ph.D.*

The genera of Madreporaria, of which the anatomy has been hitherto studied, appear to fall into two divisions, the one consisting of solitary forms and of colonies in which the calices are free; the other including genera in which a cœnenchyme, or common skeleton, is present; in the former division the body-wall is supported by peripheral lamellæ of the mesenteries, in the latter on the spines or echinulations of the cœnenchyme. (Fowler, 'Anatomy of the Madreporaria,' iii. 'Q. J. Micr. Sci.,' 1887.)

Madracis asperula, however, forms a cœnenchymatous colony in which the septa project somewhat above the general surface, and the presence of both means of support for the body-wall appears to be correlated with this fact, *Madracis* thus being morphologically intermediate between such forms as *Caryophyllia* and *Seriatopora.*

Amphihelia ramea, an imperforate coral with free calices, varies from the normal types in possessing a canal-system between body-wall and corallum, these being otherwise in contact; while the peripheral lamellæ of the mesenteries are only recognisable immediately round the lip.

In *Stephanophyllia formosissima* also the so-called costæ or ridges of coral to which the mesenteries are attached are in direct contact with, and form the only means of support for, the body-wall, this genus bearing the same relation to the *Eupsammidæ* as *Amphihelia* to the *Oculinidæ.* In the formation of strong muscle-bundles between synapticulæ, as in some minor points, *Stephanophyllia*