

especially in males, as very well exemplified in some of the commoner gnats (see Fig. 5, *d*, *e*), without feeling that they have been developed in obedience to, and as a result of, some such subtle and intuitive power as this of telepathy. Every minute ramification of the wonderfully delicate feelers of the male mosquito, in all probability, pulsates in response to the piping sounds which the female is known to produce, and doubtless through considerable distance.

There is every justification for believing that all the subtle cosmic forces involved in the generation and development of the

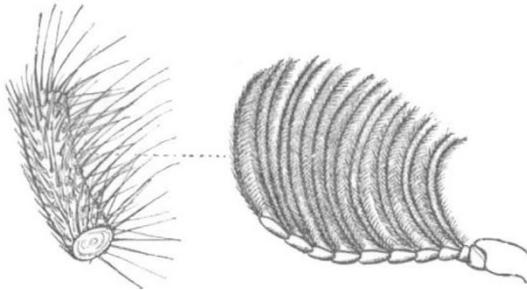


FIG. 4.—Antenna of male *Phengodes* with portion of ray.—Greatly enlarged (original).

highest are equally involved in the production and building up of the lowest of organisms, and that the complexing and compounding and specialisation of parts have gone on in every possible and conceivable direction, according to the species. The highly developed and delicate antennæ in the male *Chironomus*, for instance, may be likened to an external brain, its ramifying fibres corresponding to the highly complicated pro-

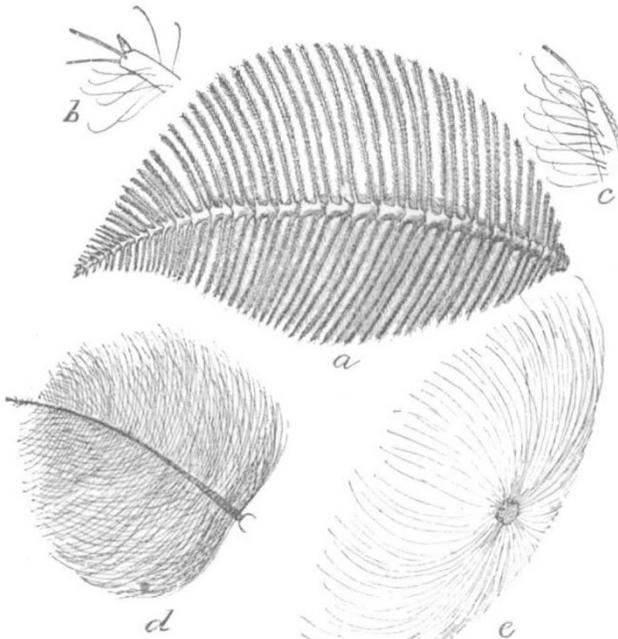


FIG. 5.—Some Antennæ of Insects: *a*, *Telea polyphemus*, male, $\times 3$; *b* and *c*, tip of the rays of same—still more enlarged; *d*, *Chironomus* $\times 6$; *e*, section of same—still more enlarged (original).

cesses that ramify from the nerve cells in the internal brains of higher animals, and responding in a somewhat similar way to external impressions. While having no sort of sympathy with the foolish notions that the spiritualists proclaim, to edify or terrify the gullible and unscientific, I am just as much out of sympathy with that class of materialists who refuse to recognise that there may be and are subtle psychological phenomena beyond the reach of present experimental methods. The one class too readily assumes supernatural power to explain abnormal phenomena; the other denies the abnormal, because it, likewise, is past our limited understanding.

NO. 1339, VOL. 52]

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—The Harkness Scholarship in Geology has been awarded to Arthur William Rogers, of Christ's College.

Mr. J. S. Gardiner, of Caius College, has been chosen to occupy the University's table at the Naples Zoological Station for six months from October 1.

The Newall Observer reports that the fine spectroscope designed for use with the Newall Telescope is now ready, and that the preliminary trials of it have been satisfactory. The mounting has been made by the Cambridge Scientific Instrument Company, and the optical parts by Mr. Brashear, of Alleghany.

Mr. F. Darwin, Mr. W. G. P. Ellis, Prof. Liveing, Mr. T. B. Wood, Prof. M. Foster, Mr. A. Eichholz, Mr. A. E. Shipley, Mr. C. Warburton, Prof. Hughes, Mr. P. Lake, Mr. O. P. Fisher, Mr. J. Owen, Mr. R. Menzies, and Mr. C. B. Fisher, have been appointed Examiners in the Science and Art of Agriculture for the University Diploma. The examination will be held in July.

Sir David L. Salomons, Bart., has founded, in connection with Caius College, a Scholarship in Engineering. The first award will be made in October. The value of the Scholarship is £40 a year for three years. The Salomons Scholar must become a candidate for the Mechanical Sciences Tripos. Applications for further information should be made to the Tutors of Caius College.

The Conference on Technical Education held at the Society of Arts last Thursday, resulted in the adoption of the following resolution:—"That in the opinion of this meeting it is desirable that provision should be made for examination and inspection in the subjects of instruction undertaken by technical instruction committees but not at present included in the schemes of the Science and Art Department, the City and Guilds of London Institute, and the Society of Arts, and that with the object of giving effect to the same this conference recommends that a representative committee be appointed to draw up a report and prepare recommendations on the whole subject."

SCIENTIFIC SERIALS.

American Journal of Science, June.—The preparation of perchloric acid and its application to the determination of potassium, by D. Albert Kreider. The difficulty attending the removal of the potassium in the ordinary preparation of this acid from potassium chlorate may be overcome by using the sodium salt instead. The insolubility of chloride of sodium in strong hydrochloric acid, with the aid of the acid-proof Gooch crucible, affords a means for the liberation of the perchloric acid and the removal of the greater part of the sodium in one operation. Sodium chlorate is heated until it gives off oxygen. When all the possible oxygen has been given off, and only the chloride and the perchlorate remain, the residue is treated with strong hydrochloric acid and filtered. The perchloric acid is thus liberated, and the sodium precipitated as chloride. The liquid is decanted, and undergoes the same operation again. The solution, containing hydrochloric and perchloric acids and a small amount of sodium chloride, is evaporated till the former acid is driven off and the heavy white fumes of the perchloric acid appear. It is then ready for potassium determinations, with which the small residue of sodium does not interfere. The filtering is done by means of a Gooch crucible, and the operation requires less time and attention than the old process, and is much less dangerous.—Mode of growth and development of the grapholitic genus *Diplograptus*, by R. Ruedemann. By the possession of a pneumatocyst and the arrangement of the reproductive organs at the bases of the stipes, the colonial stocks of *Diplograptus* have a general similarity to those of certain *Siphonophora*, while the chitinous structure of the hydrothecæ and gonangia can only be referred to the Sertularians. It thus becomes evident that the genus *Diplograptus*, like so many palæozoic fossils, has the combined properties of different groups, thus giving valuable hints in regard to the common ancestors of those groups.—On the elevation along the Rocky Mountain range in British America since the close of the Cretaceous period, by Dr. G. M. Dawson. In the mountains, the cretaceous rocks have been involved in all the flexure, faulting, and overthrust suffered by the Palæozoic; and both in the mountains and foothills these rocks are found at all angles up to vertical, and even overturned.