

of auroræ are seen when sun-spots are at their minimum, that is, at a time when in our own latitudes the number is smallest; and, on the other hand, we have Nordenskiöld's observations, which seem to point in the opposite direction. In a publication which contains much important matter on the geographical distribution and form of the aurora borealis, Nordenskiöld contrasts the appearances he has observed in the *Vega* during the winter of 1878-79, passed in the Behring Straits, with that previously observed in 1872-73 to the north of Spitzbergen. According to this author, the auroræ, during the minimum sun-spot period in 1878-79, were "hardly worthy of his notice by the side of those observed in 1872-73." But although only faintly luminous, the auroræ of 1879 were persistent and regular in shape. They did not affect the magnetic field, and seem to show a regular and continuous, though weak, electric discharge. The are and streamers in 1872 were much more brilliant and much more irregular. Some objection may be raised against these observations, in so far as they refer to different places, and local circumstances may have affected the phenomenon; but in the face of the very careful description he gives us, we cannot as yet accept Paulsen's results without further confirmation.

The problem of atmospheric electricity, like that of terrestrial magnetism, presents special features in the arctic regions, and until we possess a greater number of observations in those little accessible parts of the earth's surface, many important problems cannot be satisfactorily solved. Arctic and antarctic expeditions are of interest to scientific men, not because they care much whether we get a few miles nearer the pole, but because a well-conducted party collects invaluable information on its journey. Although much remains to be done in the regions surrounding the north magnetic pole, our knowledge in the southern hemisphere is almost disgracefully inadequate, and it is to be hoped that before long a well-equipped expedition may fill up to a certain extent the large gaps in our electrical and magnetical knowledge which at present stop so many of our researches.

But although investigations to be conducted in the arctic regions are of primary importance, we may do much nearer home in extending and completing existing information. Instrumental appliances and methods of observation, originally put into a satisfactory state by Lord Kelvin, have been improved, especially by Mascart, Exner, Elster, and Geitel. One of our most crying wants at present is a series of continuous observations by means of self-registering instruments in places where the neighbourhood of a town, or other local circumstances, do not interfere with the normal changes. The Greenwich Observatory, to which we look for help in such matters, is placed in the difficulty that the daily variations there observed are markedly different from those in the majority of places, and it is probable that the nearness of London is fatal to any generally useful series of observations of atmospheric electricity being conducted in our national Observatory.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

THE annual general meeting of the Association of Technical Institutions will be held at the Goldsmiths' Hall on Friday, the 24th inst.

THE Senate of University College, Liverpool, on the joint recommendation of Profs. Lodge and Hele Shaw, have appointed Mr. Alfred Hay, B.Sc., of University College, Nottingham, to the Lectureship on Electrotechnics, vacant by reason of the election of Mr. F. G. Baily to the chair of Electrical Engineering at the Heriot-Watt College, Edinburgh.

MR. L. F. GOLDSTAND has presented the Royal Agricultural College, Cirencester, with the sum of £200 for the institution of three silver medals annually, to be awarded according to results of the final examination for the diploma, at the discretion and decision of the Principal. The donor has requested that the medals be styled the "McClellan," the "Harker," and the "Goldstand," respectively; and the Principal, on behalf of the Governing Body, has accepted and ratified the donation.

THE eighth annual report, just published by the National Association for the Promotion of Technical and Secondary Education, is a mine of statistical and other information referring to the development of educational organisation in Great Britain. Substantial progress is recorded in the work of

technical education; and it appears that of the £744,000 annually available in England alone, £600,000 is being spent on education. In the year covered by the report, 7252 scholarships and exhibitions, of the total yearly value of £40,598, were offered by thirty-seven counties. A large section of the report is devoted to summarising the recommendations of the Royal Commission on Secondary Education.

AMONG recent appointments and nominations abroad, we notice the following:—Dr. Hürthle to be Extraordinary Professor of Physiology at Breslau; Dr. N. Busch to be Director of the Botanic Garden of the University of Dorpat; Dr. K. G. Huefner, Professor of Organic and Physiological Chemistry at Tübingen, to succeed the late Prof. Hoppe-Seyler at Strassburg; Dr. Bauschinger, of Munich, to succeed the late Prof. Tietjen as Extraordinary Professor of Astronomy at Berlin; Dr. Anton F. v. Eiselsberg, Professor of Surgery at Utrecht, to be Prof. Braun's successor at Königsberg; Dr. H. Nichols to be Lecturer in Psychology in the Johns Hopkins University, Baltimore.

SCIENTIFIC SERIALS.

The Quarterly Journal of Microscopical Science for August 1895 contains: On the variation of *Halicyclus octoradiatus*, by Edward T. Brown (plate 1). Some 154 specimens were examined, 120 of these were perfectly normal but 34 afforded either cases of congenital variation, or showed regeneration of organs after destruction or injury. Most of the abnormal forms are figured.—On the collar-cells of *Heterocœla*, by George Bidder (plate 2). Observations were made on *Leucandra aspera*, *Sycon raphanus*, *S. compressum*; this last was found best suited for examination under high powers during life, its collar-cells are among the largest, if not as large, as any known. The protoplasm of these cells is in life greenish, and they have nearly the form and relation to each other of full corn-sacks standing side by side in a granary. The living collar is invariably an almost perfect cylinder, very little constricted at its base. As to Sollas's membrane, the statements of Vosmaer and Pekelharing, which the author once thought erroneous, he now confirms, there is no normal union of the collars, the membrane is only to be met with in "paraffin sections."—The metamorphosis of Echinoderms, by Henry Bury (plates 3-9). With the view of clearing up some of the differences in observation and opinion of the more recent observers of the metamorphosis of this group, the author has worked out as far as possible the metamorphic changes of at least one form of larva in each of the five classes of Echinoderms; for reasons given, the metamorphosis of *Synapta* is written in greater detail than that of the rest. As to the relation of the Echinodermata to the Enteropneusta, "there seems to be a chain of evidence of their connection, which though not indeed conclusive—that embryological evidence alone can never be—is at least as strong as that which binds together any two of the great subdivisions of the animal kingdom."—A criticism of the cell-theory; being an answer to Mr. Sedgwick's article on the inadequacy of the cellular theory of development, by Gilbert C. Bourne. The article of Prof. Sedgwick here criticised appeared in the *Q.J.M.S.* for November 1894.

THE number for November 1895 contains:—On the distribution of assimilated iron compounds, other than Hæmoglobin and Hæmatins, in animal and vegetable cells, by Dr. A. B. Macallum (plates 10-12). After some preliminary remarks on the special literature of the subject and references thereto, the author details his methods of study. This portion of the memoir is very instructive, not only for the facts recorded, but for the hints given; chlorophyll yields no evidence that it contains iron, and it is mentioned incidentally that species of *Monotropa* remain colourless when fixed in solutions of corrosive sublimate. The greater part and sometimes the whole of the assimilated iron in the cells of the higher forms of animal life is held in the nucleus, in the chromatin of which it is chiefly found, and the same is true of the nuclei of all the higher vegetable organisms; it is rarely found in the cytoplasm of the cells, but full details of such occurrences are given. An important section is devoted to the occurrence of assimilated iron in special forms of life, such as in protozoa, fungi, bacteria, and the Cyanophyceæ.—On the structural changes in the reproductive cells during the spermatogenesis of Elasmobranchs, by J. E. S. Moore (plates 13-16). The author establishes a long series of structural homologies found before, during, and after the synaptic phase in the repro-