

spectral type separately (except only the A stars), and the effect appears to be more marked in the later types. Further, the highest known velocities are found in the vicinity of the Milky Way. It is conjectured that the effect may be due to the operation of a resisting medium on stellar bodies differing in size and density, or the closer proximity of the fainter stars to a "source of general gravitational action." In either case the Milky Way would be deeply concerned.

In another note in the same journal Mr. Perrine analyses the spectral distribution of the stars of large radial velocity, finding the maximum mean values among the faint stars of classes F and G.

**VOLCANIC DUST VEILS AND CLIMATIC VARIATIONS.**—Fluctuations in the observed intensity of the solar radiation have been interpreted during the past ten years or so as traceable to the screening effects of the enormous quantities of dust poured into the upper atmosphere during notable volcanic eruptions; thus it has been a small step to the wider hypothesis that volcanic dust has been a possibly important factor in the production of past climatic changes. This hypothesis is tested by Mr. Henryk Arctowski in a paper communicated to the New York Academy of Sciences (Ann., Vol. xxvi., pp. 149-174, June, 1915). Previous work on temperature records had led him to the conclusion that a general rise in the temperature of the atmosphere was probably due to an increase in the solar constant itself. From a re-examination of temperature curves, chiefly showing departures from monthly means, paying special attention to the epochs of the Krakatoa (1883) and Katmai (1912) eruptions, as well as the year 1902, which was marked by intense vulcanism in both hemispheres, he now concludes that the short-period variations of temperature have nothing in common with the presence or absence of volcanic dust veils, although minor secondary modifications of the temperature curve may sometimes be traced to this cause. He finds that the sun-spot variation does appear to have an influence on atmospheric temperature, and, moreover, presumes, but does not explain, the existence of a correlation between the temperature changes and frequency of volcanic eruptions.

**THE AURORA BOREALIS.**—An illustrated account was given in NATURE, August 7, 1913, of the photographic observations made by Prof. Carl Stormer, in collaboration with M. Bernt I. Birkeland, in the spring of 1913. These observers were stationed at Bossekop and Store Korsnes respectively. They secured a great wealth of parallax material which will require a long time for reduction. However, one-sixth having been finished, Prof. Stormer has published a preliminary report ("Terres. Mag. and Atmos. Elec.," vol. xx., No. 1). Some six hundred measures of altitude have been worked out, most of the measured points lying between 90 and 130 km. above the earth's surface; none come out appreciably lower than 90 km., whilst the highest reaches 230 km. From a mere inspection of the diagram the mean height appears to be about 120 km.; thus the lower limit is fairly well marked. The spatial relations of a number of auroral curtains have been worked out in detail. In one case this information has been used in conjunction with magnetograms from the Haldde Observatory, to obtain an idea of the nature of the aurora. The curves show that the magnetic effect due to the passage of the particular auroral feature had components directed N.W. and upwards. On the assumption that the display was caused by electric corpuscles travelling towards the earth, Ampère's rule indicates that the observed deflections would result from the motion of particles carrying a positive charge.

NO. 2394, VOL. 96]

### AMERICAN HYDROIDS.<sup>1</sup>

MR. NUTTING may be congratulated on the completion of the third part of his great monograph on American Hydroids. He has a generous conception of America, and includes in his list such species as *Silicularia hemispherica* from S. Tierra del Fuego and *S. repens* from Kerguelen. It is therefore almost a monograph of the hydroids of the world, and will be regarded as the most important work of reference on the group that has yet been published. Those who are specially interested in Cœlenterata will probably be gratified to find that Mr. Nutting has taken a conservative attitude as regards species, and that, notwithstanding the many temptations to which he has been exposed in the course of his vast labour in this field, he has added very few new species to those already recognised. It is a much easier method—and a particularly attractive one in the preparation of a standard treatise on systematic zoology—to make new species when difficulties arise than to exercise the skill and patience that is required to place doubtful specimens in their proper specific groups, and we may regard it as a sign of Mr. Nutting's knowledge and thoroughness that the list of species is not a longer one.

The method adopted in dealing with the species is to select a specimen regarded by the author as typical, to give in a footnote the locality from which the specimen came, and then to describe it in detail. There is much to be said for this method in dealing with the systematics of Cœlenterata, because it gives the systematist a fixed point, as it were, around which the variants may be grouped, but it seems to us that to that description of a type some statement should be added of the principal variations observed by the author in the species under consideration in order that future workers in the group may find that some of the difficulties they are sure to meet with in using the monograph as a standard work of reference have been anticipated by a recognised authority.

The author has evidently taken infinite pains to collect from all available sources specimens of American hydroids for study and description, and his reference lists at the head of each species are extraordinarily complete and accurate. Our thanks are due to him for a very valuable work. S. J. H.

### UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

THE Board of Education informs us that the regulations and syllabuses which governed the examinations in science and technology held in 1915 will continue in force for 1916. In the prefatory note to the volume of regulations and syllabuses for examinations in science and technology, 1915, the Board announced its intention to discontinue those examinations at a date to be afterwards announced. The Board now gives notice that after 1916 it will no longer hold lower general examinations in any subjects of science and technology. The higher general examinations will for the present be continued.

THE prospectus for the forthcoming session of the Belfast Technical Institute has now been published. An interesting departure is the indication by an asterisk prefixed to the name of the members of the permanent staff who are at present serving in the Army or Navy, or who are engaged on war service. The number of asterisks is excellent testimony to the

<sup>1</sup> "American Hydroids." Part III. The Campanulariæ and the Bonneviellidæ. Smithsonian Institution. Special Bulletin. Pp. 126+70 text figures+27 plates. Washington, 1915.