

OUR ASTRONOMICAL COLUMN.

VARIABILITY OF EROS.—In the *Astronomische Nachrichten* (Bd. 154, No. 3688), Dr. E. von Oppolzer describes his observation of the planet Eros, which led to his announcement of its variations in brightness. The measures were made with the Zöllner photometer on a Grubb refractor of 8½ inches aperture at Potsdam.

In the same journal there are further confirmatory reports from the observatories of Königsberg and Heidelberg.

NEW TYPE OF SHORTENED TELESCOPE.—In the *Astronomische Nachrichten* (Bd. 154, No. 3691), M. E. Schaer describes some experiments he has made at the observatory of Geneva with the object of facilitating the use of long focus objectives. The light from the object glass is reflected backward and forward from two silvered plane mirrors, so that the distance between eyepiece and objective is only about one-third the focal length. Good photographs of the sun's surface were obtained by using unsilvered glass mirrors and giving an exposure of about one-fiftieth of a second.

CATALOGUE OF NEW VARIABLE STARS.—Harvard College Observatory Circular, No. 54, contains a catalogue of sixty-four new variable stars discovered by the observers at that institution. The majority of these have been detected on examination of the Draper Memorial spectra, by reason of the presence of bright lines of hydrogen in the peculiar cases. For the purposes of this catalogue the variables have been divided into two main classes (1) those having a large range of variation, (2) those in which the extent of variability is small—from half a magnitude to a magnitude. The variables examined are then classified under these headings, 39 of long, and 25 of short period.

NEW COMPONENT OF THE POLAR MOTION.—In the *Astronomical Journal* (vol. xxi. No. 490), Prof. S. C. Chandler makes a preliminary announcement of the detection of a new component relating to the motion of the terrestrial pole. In addition to the already known 428-day and annual terms, he now finds a variation having a period of 436 days and a radius of 0"09—considerably smaller, therefore, than the others. In the absence of more minute data, the orbit is assumed circular, and the author proceeds to investigate the nature of the variation produced as the resultant of the old 428-day and the new 436-day motions.

The combined motion is found to be subject to a period varying from 431·4 and 415·0 days, the mean length being 428·5 days. The fluctuations are embraced in a cycle of about 57 periods, or 67 years. With respect to the whole cycle, however, the changes of period are of a remarkable character. During five-sixths of the cycle the period remains between its mean value and the upper limit, i.e. between 428·5 days and 431·4 days; then it suddenly shortens to minimum, 415 days, and immediately rapidly lengthens again. In addition to this the variations of the radius of motion are also singularly asymmetrical. It is at present about 0"07 and approaching its minimum value of 0"05; there was a decrease from 0"17 to 0"11 between 1890 and 1897. It will be interesting to note whether the predicted variation of the period actually takes place. Between 1850 and 1890 it persisted at the value 430 days, is now about 428 days, and should continue to shorten to the minimum value of 415 days within the next few years; but of course no sharply-defined numerical limit can be stated on account of the fact that the length of the harmonic cycle, which depends on the difference of the two component periods, is imperfectly determined by existing observations.

INAUGURATION OF A BIRMINGHAM SECTION OF THE INSTITUTION OF ELECTRICAL ENGINEERS.

DURING the last few years, the Institution of Electrical Engineers has actively encouraged the formation of local sections, each having headquarters in some industrial centre.

These local sections are free to manage their own affairs, but the parent Institution arranges that important papers read at any of the local centres are incorporated in their journal, as also are local contributions to the discussion of papers read originally in London. Of the five branches now existing, the most recently formed is that in Birmingham.

The Birmingham local section of the Institution of Electrical

Engineers has been fortunate in its first chairman, Dr. Oliver Lodge, principal of the new University, who delivered an address from the chair on Wednesday evening, February 27, at the Inaugural Meeting of the section, before a large gathering of engineers. The president of the Institution, Prof. John Perry, was present to support the local movement.

In the course of some opening remarks, Dr. Lodge congratulated the parent Institution on its wisdom and enterprise in forming local branches. Multiplicity of publishing centres was bad for science; but the lack of stimulus to local exertion was bad too. By the present action of the Institution both evils were avoided.

The original Society of Telegraph Engineers dealt chiefly with cable enterprise. Then it took over successively the telephone, electric lighting, transmission of power, and trams; and now it seemed about to take over underground traffic, and, in some countries, the railways themselves. Again, a warship was full of electrical contrivances, and the Institution sent a corps of experts to add to the land forces in South Africa.

With regard to the engineer's education, the chairman pointed out that it must be truly scientific. Some said that a general education and mathematics were unpractical and useless encumbrances. What they really meant was that if a youth had these and nothing else he was useless, and that he would be more useful if he failed to possess these, but did possess many other powers and aptitudes. This was true; but the two were not mutually incompatible.

Mathematics, for example, was often so taught that by the time a man had acquired a great deal of it he was somewhat unfitted for anything else. A common-sense mathematical training was an essential for an engineer or for a physicist. Euclid himself was splendid. So was his book for its day and generation, and its purpose as a system of geometrical philosophy admirable; but it had had its day, and for elementary and popular purposes should now cease to be. We were too busy; there was too much to learn nowadays to have time to cross every river by ascending to its source and walking down the other side. Professional guides along the old river path still attempted to hide the bridges, because if they were too easily seen their occupation would be gone; but the bridges were there, and sooner or later even schoolboys would be permitted to make use of them and enjoy the country on the other side, without spending all their days in a toilsome and deterrent mode of getting there over a route approved by the ancients.

The pursuit of pure science for its own sake was a good and wholesome formula up to a certain point, because the tendency of unregenerate man had always been opposed to it. The usefulness of scientific application needed no preaching, but, strangely enough, there was a great tendency to forget or ignore the scientific foundation on which they rested. And the human mind was so constituted that, as a rule, the necessary powers and aptitudes for the two things did not go together. The man who could pursue pure science did so best, as a rule, when he was not distracted by considerations of utility; the applier of science, on the other hand, soon got so immersed in practical details and pecuniary considerations which were clearly vital that he had neither leisure nor inclination, nor always the right kind of ability, for advancing the pure science itself.

Pure science must always advance into territory which appeared for the moment rather useless and barren and aloof from humanity; it must be so, since it was new ground never open to humanity before. Consequently there was a weird unearthliness about it which to people engaged in the turmoil of business might be cold and repellent, if ever they allowed themselves to be assisted to breathe its atmosphere for a moment. The strange, new, unknown, bracing air had a fierce fascination of its own, akin to that of the lone ice-packs of the Arctic seas to the healthy and intrepid explorer, or as the mountain tops were to the members of the Alpine Club. So enticing did the atmosphere of pure science become to those who frequently breathed it that to them sometimes it seemed the only air worth breathing, and the everyday atmosphere of humanity was close and stifling in comparison. Let such men of genius alone; encourage them in their quest; they were not too numerous, and whither they showed the way others hereafter would follow. Moreover, the region which they entered was no limited Arctic circle in reality; it was, as it were, the Arctic entrance to another world, whence, if they penetrated further in pursuit of the pioneers, they would ultimately reach the temperate zones of work and livelihood and applied science; nor