

to determine the annual parallax of the star 40 α Eridani. The principal star of this system has a proper motion of 4" a year; and, at a distance of 82", there is a double companion, which has the same proper motion, while nearly between them is a small star which does not move. Professor Hall finds for the parallax of 40 Eridani

$$\pi = 0''.223 \pm 0''.0208.$$

a result rather smaller than might have been expected, but one which he considers worthy of considerable confidence.

Comet Tuttle (1790 II.).—Swift reports having found the comet on August 13. He describes it as "fairly bright on a dark sky, and shows a strong condensation at the centre." As far as we have learned, he is the only one who has seen the comet at this return, except the astronomers at Nice.

The nebula in Andromeda.—The new star in the Andromeda nebula continues to decrease in brightness. On October 10 it was estimated as 9.9 magnitude with the transit circle of the U. S. naval observatory. This estimate depends upon the same star used in the previous observations (*Science* vi., 310).

Comet 1881 III (b) Tebbutt.—Dr. de Ball intends to compute the orbit of the above comet, and calls for any observations still unpublished. Address, 'Dr. de Ball, Observatoire, Ougrée, Liège, Belgium.'

NOTES AND NEWS.

THE curriculum of the University of Michigan has been altered and enlarged in order to provide a specific course of study for students who wish to devote their time largely to biological work, either as a preparation for the study of medicine or with a view to teaching or engaging in biological research. Zoölogy, botany, and physiology are the most prominent subjects of the course, but full opportunity is given for extended work in physics, chemistry, paleontology, and other sciences.

—The first one of a course of ten lectures on physiology and hygiene, under the auspices of the Cincinnati society of natural history, was given on October 3. These lectures are free to teachers of the public schools, and the interest is shown by the application of about seventy-five teachers for tickets to the course. This is the second course given by the society, the first having been on botany.

—Cable dispatches announce the death of Thomas Davidson, preëminently the British student of Brachiopoda. He was born in Edinburgh, May 17, 1817, and received most of his education on the continent. A review of his latest work will

be found in *Science* (v., 409). The monograph of recent Brachiopoda, there referred to as in preparation, has actually been completed. Under date of June 1, in a letter to a friend in this country, which we have been permitted to see, he says that it will be accompanied by 30 plates, containing 865 figures, and adds: "I can assure you that this work has taken me a long time to complete, and, since I have been ill for several months, it is fortunate that all is ready to send to the printer. I have thus been able to bring to successful conclusion all that I had proposed to accomplish, and I am now ready to leave this world as soon as God wills." This indefatigable investigator adds that he has also completed a bibliography of the Brachiopoda which will occupy about 200 quarto pages and contain about 3400 titles; the first part will be printed by the Palæontographical society this year and the balance in the volume for 1886. "I have been able," he concludes, "to make a very rich and nearly complete collection of recent Brachiopoda, and I propose to bequeath the whole of this, as well as all my fossils, to the British museum."

—James Macfarlane, well-known for his useful 'Geological railway guide' and 'Geologist's travelling handbook,' died suddenly on the 12th instant at his home in Towanda, Penn., of heart disease. He was born Sept. 2, 1819, at Gettysburg, Penn.

—In the *Philosophical magazine* for August, Shelford Bidwell, Esq., in a paper entitled 'The sensitiveness of selenium to light and the development of a similar property in sulphur,' describes a series of very interesting experiments, which would seem to show that the action of light in varying the resistance of a selenium cell arises from the fact that the conductivity of the cell is due to a selenide of the metal with which it is annealed (the crystalline selenium itself being practically a non-conductor), and that the formation of this selenide is assisted by direct radiation of light. With sulphur and silver he formed cells showing the same variation of resistance in light and darkness, and showed very plainly that the union of sulphur and silver into the sulphide, at ordinary temperatures, is greatly assisted by direct radiation, and is not due to rise of temperature of the substances themselves. The whole analogy of the actions of sulphur and selenium in the two cases, coupled with the enormously high resistance of pure selenium when crystallized between glass plates or substances with which it does not combine, seem to render his conclusions highly probable. The whole paper is of great interest.

—The Russian government has just despatched one of the foremost mining authorities of the day, M. Gulishambaroff, to Askabad, in Central Asia,

to investigate the mineral treasures of the region. M. Gulishambaroff has made his name principally in writing on petroleum, which will be one of the subjects of investigation ; but the sulphur deposits of the Turcoman desert are his main object. Specimens of fine iron ore have also been sent in from the Akhal oasis, and the extent of this is to be reported on. The Herat territory, which is contiguous to the new Russian acquisitions, is rich in minerals.

— The new Institute of hygiene founded in connection with Berlin university, and presided over by Dr. Koch, is so far advanced towards completion that lectures will be held in it this term. It is principally intended for the study of bacteriology.

— Prof. O. C. Marsh, of New Haven, discussed the size of the brain in extinct vertebrates before the British association recently ; this is a subject which has engaged his attention for fifteen years. In every instance he found that the mammals from the lower tertiary had very small brains. He carried out his investigation into the upper tertiary, and found that the brain was much larger in the pliocene than in the miocene. All the tertiary mammals had small brains ; there was a gradual increase in the size of the brain during this period ; and this increase in the size was generally in the cerebral hemisphere or higher portions of the brain. In some groups the convolution of the brain had gradually become more complex. In some the cerebellum and the olfactory lobes had even diminished in size. There is now evidence that the same general law of brain growth holds good for birds and reptiles from the Jurassic period to the present time. The brain of an animal belonging to a vigorous race fitted for a long survival was larger than the average brain of that period in the same group ; and the brain of a mammal of a declining race was smaller than the average brain of its contemporaries of the same group. The small animals now existing had proportionally larger brains than the larger animals, and young animals had proportionally larger brains than adult animals. They found some interesting examples which threw light on this question. For instance, in the eocene they had an animal, the oldest known ancestor of the rhinoceros, and it had an exceptionally large brain. Taking all the facts together, it seemed as though this brain growth was an important element in the survival of animals. If the animal became large and unwieldy with a small brain, it would be liable to suffer from any change of climate. In other words, in early times the big brain conquered, as it is the big brain that conquers in civilization to-

day. In the discussion which followed the paper, Professor Flower said it was satisfactory to find a case where the facts worked out coincided with previously-formed theories, because that was not always the case, and sometimes the facts or the theories had to go to the wall. In this case they had no such difficulty, and they had to thank the American government for the way it had taken up Professor Marsh's work and was disseminating it.

— A very convenient summary of the results obtained by the English society for psychical research and the tendency of their work is to be found in an article by Grace Peckham, M.D., entitled, 'A critical digest of the proceedings of the English psychical society.' It is published in the *Journal of nervous and mental disease* (New York) for July, 1885 (published in September).

— The Columbia college philosophical society is to be revived this winter. It was organized in 1882, and during that and the following winter held monthly sessions of much interest. Papers were read by Prof. Archibald Alexander, Prof. G. Stanley Hall of Johns Hopkins university, Prof. William M. Sloane of Princeton, Dr. Nicholas Murray Butler, Dr. Edward W. Hopkins, and others. The average attendance at these meetings was fifty, and an even larger attendance is hoped for this winter.

— The English and American societies for psychical research may receive some coöperation from the Société de psychologie physiologique just started in Paris. This society purposes making a study by observation and experiment of all phases of psychical activity, both normal and pathological. M. Charest is the first president, and MM. Janet and Ribot the vice-presidents of the society,

— The Russian papers announce that the section of the Transcaspian railway from Kizil Arvat to Askabad is almost complete, and that it may be expected to be formally opened at an early date. They are also asking whether the line is to stop at Burdalik, its ultimate destination on the Amu Daria, or whether it is to be carried beyond that place. A commission, composed of members of the different departments, has been appointed to investigate the subject.

— The portrait of Prof. Louis Agassiz, in our last number, was drawn by Robert Lewis from a large photograph by Sonrel, taken about 1865. Sonrel, it will be remembered, was an artist in the employ of Professor Agassiz, who afterwards, from failing eyesight, turned his artistic skill into the photographic field. The larger part of the plates in Agassiz's 'Contributions to the natural

history of the United States' were drawn from nature on stone by Sonrel.

WASHINGTON LETTER.

THE Chemical society, although one of the youngest, is by no means the least active of the scientific societies of Washington; in fact it will take a relatively high rank in that respect. It is presided over by Professor F. W. Clarke and its members number about forty. The first meeting for the season was held on the evening of the 8th of October. It happened that both the president and secretary were absent, but there was a good attendance of members and an interesting meeting was held. Mr. Chatard gave an informal account of his recent examination of the leading salt works of the country, together with a general discussion of the manufacture of salt in America. Mr. Chatard has been engaged for some time under the U. S. geological survey in the study of this question, especially with a view of determining whether any practical use can be made of the great alkali deposits which are so abundant in the United States, and it is likely that the subject will occupy his attention for some time to come.

It has sometimes been found difficult to provide interesting material for the 'first meetings' of societies here, for the reason that many of the active contributors to their proceedings have just returned from their summer campaigns and have had no leisure for working up the material which they have accumulated. The Chemical society was this year an exception to the rule and so, also, was the Philosophical society, which held its first meeting on the evening of Saturday, the 10th of October. Dr. Billings had provided an interesting programme in the exhibition and discussion of a large and valuable collection of anthropometric apparatus recently received at the Army and navy medical museum. A large part of it was a duplicate of what had been used by Galton in his laboratory, and a very interesting part had been manufactured in Germany by Mr. Cattell. It was understood that the latter involved some improvements on forms devised by Mr. Stanley Hall for the investigation of the time occupied in certain simple mental processes. By means of a sort of drop shutter, somewhat resembling a guillotine, the subject upon whom the experiment was being made was permitted to see for only an instant the object, the nature of which he was to determine as quickly as possible. The thing to be seen may be a card of a particular color, the subject being required to decide what color it is, or but two colors may be used and he may be required to decide which of the two appears. Diagrams of

different forms may be used, and the time occupied in judgment of form determined. Cards with various numbers of well defined dots on them may also be displayed, and the subject required to announce the number as determined from his instantaneous view of the card. In this way something may be known in regard to the maximum number of individual objects which one recognizes, or can correctly announce, without the operation of counting. It was stated that experiments conducted in this manner gave three as this maximum, which is certainly less than the result obtained by a different mode of experimentation. The apparatus was arranged to register the time intervals by means of a Hipp's chronoscope. Considerable discussion resulted from the exhibition of the instruments, and the use of a Hipp's chronoscope was criticised by several members. It is unquestionably complicated in its form and requires a good deal of skill and experience in its use. There are several modern methods of time measurement for small intervals which appear to excel it in simplicity of construction, ease of operation, and accuracy of performance. So much interest was manifested in this discussion that it was found necessary to postpone a paper on psychrometry by Mr. H. A. Hazen, which was on the programme for the evening, and it will be taken up at the next meeting.

Lieut. Cornwall of the Bureau of navigation, in charge of the 'division of compasses,' has gone to Mr. Roach's ship-yard at Chester, Penn., to make experiments on the magnetic constants of the new steel cruisers, Boston, Atlanta, and Chicago. The last is still unfinished and as its azimuth has been constant for some months, the investigation of its magnetism now, and again after launching, will doubtless be of much interest.

Within the past week the capital has been visited by Mr. Clements R. Markham, secretary of the Royal geographical society of London. His stay in the city was necessarily short, and he was unable to visit all of the centres of scientific activity in the city; but his brief visit was much enjoyed by those who had the pleasure of making his acquaintance.

Not everybody is aware of the interest which Professor A. Graham Bell has long taken in the instruction of deaf-mutes, or that he has for some time maintained an 'experimental' school for deaf children in this city. Mr. Bell has recently taken a very important step in the organization of a normal or training school for teachers in connection with this school for children. He is desirous of training young ladies who are thoroughly interested in this work, in the methods which he has devised, tested, and approved for instructing deaf-mutes, and especially in the methods of teaching