

with that of two 5.9-magnitude stars near to it, and on September 11 Mr. Rolston found that it was as conspicuous as ν Draconis.

From later observations, August 19, 21, and 24, Dr. Kobold has calculated improved elements and an ephemeris, which he publishes in the supplement named, and from which we take the following:—

Elements.

$$\begin{aligned} T &= 1911 \text{ October } 27.76235 \text{ (M.T. Berlin)} \\ \omega &= 152^\circ 44' 17.7'' \\ \Omega &= 293^\circ 10' 6.1'' \\ i &= 34^\circ 0' 2.3'' \end{aligned} \left. \vphantom{\begin{aligned} T \\ \omega \\ \Omega \\ i \end{aligned}} \right\} 1911 \text{ o}$$

$l g q = 9.690358.$

Ephemeris 12h. Berlin M.T.

1911	a (true) h. m.	δ (true)	log r	log Δ	mag.
Sept. 13 ...	17 14.2 ...	+57 9.7 ...	0.0396 ...	9.7171 ...	5.1
„ 15 ...	16 48.1 ...	+56 40.5 ...			
„ 17 ...	16 22.6 ...	+55 50.5 ...	0.0113 ...	9.7136 ...	4.9
„ 19 ...	15 58.5 ...	+54 42.1 ...			
„ 21 ...	15 35.8 ...	+53 16.8 ...	9.9808 ...	9.7152 ...	4.8
„ 23 ...	15 14.6 ...	+51 37.1 ...			
„ 25 ...	14 55.6 ...	+49 44.7 ...	9.9482 ...	9.7214 ...	4.7
„ 27 ...	14 37.9 ...	+47 41.9 ...			
„ 29 ...	14 21.8 ...	+45 30.0 ...	9.9132 ...	9.7321 ...	4.5

On the accompanying chart we show the approximate apparent path of the comet among the stars for the next month.



Apparent Path of Brooks's Comet, 1911c, September 13 to October 15, 1911.

From the ephemeris it will be seen that the comet is nearest to the earth about September 17, when its distance will be about 48 million miles. In calculating the magnitude, Dr. Kobold has taken 6.0 on August 26 as his fiducial point, and from opera-glass observations made on that date we believe that his figure probably errs in the direction of making the comet too faint, so that we may expect to see a fourth-magnitude object at the beginning of October.

VARIABILITY OF POLARIS.—Numerous observers have suspected α Ursae Minoris to be a variable star, and several periods have been found for its variation, but a lack of agreement has left the question somewhat undecided. As a result of a very large piece of observational work, however, Dr. Ejnar Hertzsprung finds that the pole star is a variable of the δ Cephei type having an amplitude of 0.171 ± 0.012 , and a period of 3.9681 days. The grating method described in *Astronomische Nachrichten* No. 4452 was employed, the first- and second-order images of Polaris being compared for density with the image of a neighbouring star. Observations were made on fifty nights, 418 plates being secured with four exposures on each, and the results are tabulated in the paper in No. 4518 of the *Astronomische Nachrichten*. Dr. Hertzsprung also shows that Polaris has other attributes of a Cepheid variable.

OBSERVATIONS OF MARS.—A telegram from Prof. Lowell, published in No. 4521 of the *Astronomische Nachrichten*, announces that photographs of the Martian canals were secured on August 30.

In the same journal M. Jarry Desloges makes some pre-

liminary remarks concerning his observations of the planet during the present opposition. The seeing generally has not been good, although latterly he has been able to use a power of 500, and has had moments of absolute calm. The Mare Cimmerium, among other features, is still very pale and difficult to see during Martian morning. The gulf which formed on Zephyria in 1909 is still visible, and a bright area has been detected on its interior. Aonius Sinus is sharply outlined, but the whole region of the Solis Lacus, although well placed for observation, is lacking in colour; the lake itself is double, or greatly constricted across its median line, as in 1907 and 1909. A number of "canals" appear as broad bands with indefinite edges, and are quite easy to see despite the great distance of the planet; Cyclops, Cerberus, Læstrygon, Titan, Araxes, Coprates, and Bathys are among these, and the last named is more easily seen than in 1907, although the planet was much nearer then. Many bright spots, e.g. Elysium, Aëolis, Zephyria, Memnonia, Tharsis, &c., are visible, but the southern polar cap is very small and at times difficult to distinguish, appearing as though it were veiled.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

THE University of Edinburgh has just instituted two degrees in veterinary science, viz. bachelor and doctor.

A STATE college of forestry has been established at Syracuse University, and the sum of 55,000 dollars has been appropriated for it.

DR. FRASER HARRIS, at present lecturer on physiology in the University of Birmingham, has been appointed professor of physiology in the Dalhousie University, Halifax, Nova Scotia.

MR. E. D. SANDERSON, dean of the college of agriculture at West Virginia University, has been appointed to succeed Mr. J. H. Stewart in January next as director of the experiment station. He will continue to fulfil the duties of dean.

ELEMENTARY courses of medical study, both theoretical and practical, have been arranged by the authorities of Livingstone College, Leyton, E., for those about to engage in missionary work. Particulars of the course, and the "Mrs. Bishop exhibition," can be obtained from the principal of the college. The session begins on October 2.

At the jubilee celebration of the University of Christiania, the honorary degree of doctor was conferred upon the following British representatives:—Prof. Alfred Marshall; Sir Thomas Barlow, Bart., K.C.V.O., F.R.S.; Sir J. Rose Bradford, K.C.M.G.; Prof. Sir W. Osler, Bart., F.R.S.; Rev. Prof. A. H. Sayce; Dr. H. Sweet; Prof. Sir James Dewar, F.R.S.; Dr. H. A. Miers, F.R.S.; Sir John Murray, K.C.B., F.R.S.; Prof. Sir William Ramsay, K.C.B., F.R.S.; Prof. W. J. Sollas, F.R.S.; and Prof. Sir J. J. Thomson, F.R.S.

THE Board of Education has issued its regulations for scholarships, exhibitions, &c., in science for the year 1912. The awards for science to be made by the Board under these regulations are identical with those formerly made by the Board under the regulations for technical schools, 1909-10. The conditions for these awards in 1913 will be modified. The subjects of the competitive examination will remain the same, but the papers set will be of not more than two standards corresponding with those of the new scheme of general science examinations. The Board of Education is of opinion that further changes in the conditions of award of Royal scholarships, free studentships, and of Whitworth scholarships and exhibitions, may with advantage be made later, but such alterations will not be brought into operation without due notice being given.

In the case of the Merchant Venturers' Technical College, Bristol, in which the faculty of engineering of the University of Bristol is provided and maintained, the new calendar shows that the complete arrangements made last year are to govern the work next session, and that the educational needs of every important industry of the city have been borne in mind. It is interesting to notice that several local firms have notified their willingness, other things being equal, to give a preference to students who

have completed a course of work in the engineering department; and some firms are prepared to take students into their works at reduced premiums, or, in others, without premiums. Some firms, too, have agreed to allow their apprentices to present themselves at their works at 7 o'clock in place of at 6 o'clock on not more than two mornings a week during the college evening-class session provided they can produce a certificate from the college at the end of the session stating that they have attended a number of evenings equal to the number of cases on which they have availed themselves of the concession.

THE new calendar of the Battersea Polytechnic shows that in the Day Technical College full-time courses are arranged in mechanical, civil, electrical, and motor engineering, architecture and building, and chemical engineering. The courses cover a period of three years, at the end of which time students passing the necessary examinations are awarded the polytechnic diploma. Concurrently with the diploma courses, students can take the degree courses in science and engineering of the University of London. Several new developments have been arranged; in the mechanical engineering department a course of lectures on illuminating engineering will be held; in the electrical engineering department special attention will be given to electric traction, and new machinery and apparatus are being purchased so that the subject may be more thoroughly taught. Attention may also be directed to the chemistry course for sanitary inspectors, and to the arrangements which have been made for the provision of special lectures by trade experts in connection with the paper-making course.

AMONG the college calendars, providing information respecting the arrangements made for the forthcoming session, which have been received during the past week may be mentioned that of the Edinburgh and East of Scotland College of Agriculture, which affords evidence of the greatly increased activity in this branch of technical education. Particulars are given of the courses which may be taken at the central institution in the departments of agriculture, horticulture, and forestry. In horticulture, during the coming session a commencement will be made with the newly instituted two years' course leading up to a special certificate. It is hoped that this course, which has been established at the instance of the Scottish horticultural societies, will be taken advantage of by intending nurserymen, market and estate gardeners, and others. Under the new arrangements with the University of Edinburgh, the teaching in forestry subjects is to be shared between the University and the College, and details are given of the courses offered in the combined forestry school. Various experiments in the growing of field crops and in other branches of agriculture and horticulture are conducted under the advice of local committees of practical men, and are directed towards the solution of problems of importance in the business of the farmer and gardener.

THE celebration of the 500th anniversary of the foundation of St. Andrews University is now in progress, and the influx of distinguished visitors into the ancient city far exceeds anything of the kind in former years. The presence of Royalty alone is necessary to complete the scene. Almost all the visitors are the guests of the University staff, of the St. Andrews School for Girls, of the citizens of St. Andrews and Dundee, or of country houses in Fife and Forfarshire—within easy reach of the city by motor carriages. The cordiality with which all responded to the call for accommodation was a source of gratification to the executive. For the carrying out of the programme various committees dealing with the several departments have been at work about a year. Thus the publications committee has issued several memorial volumes, literary, scientific, and historical, and there is also a small quincentenary handbook of the city and the University of St. Andrews by the librarian. In the memorial volumes the zoological department and the Gatty Marine Laboratory do not bulk so largely as, for example, chemistry, since the history of the laboratory, with the list of publications up to date, forms an independent publication. A large temporary hall about 90 yards in length and 30 yards in breadth has been fitted with a spacious platform at one

end and an orchestra at the other, the whole structure occupying the old archery butts to the north of the United College. This hall accommodates between three and four thousand people. Covered ways lead to several cloak-rooms, to the museum, and to the United College buildings generally. In the upper hall of the library in South Street is an exhibition of early and rare printed books and manuscripts. Everything has been done in the way of facilitating transit by railway from a distance and to Dundee, as well as arranging for local conveyances. Clubs for men and for women, a camp in the University park for students, a special post-office and a refreshment-room in the Town Hall are other features which have received attention. Never did the old grey and sea-girt city, with its parallel streets leading to the cathedral, look more charming, or its finely planted promenades and walks (under the fostering care of the Town Council) more enticing. To every graduate and student, as of old, the place appeals with an irresistible charm, and it is to be hoped that the distinguished visitors will be no less fascinated by their unique surroundings. Next week we hope to have an account of the celebration, which began with a reception by the Chancellor on Tuesday evening. Besides the men of science mentioned in NATURE of last week, the following will receive the honorary degree of LL.D.:—Dr. Berry, Dr. Byron Bramwell, Sir H. Butlin, Sir Hector Cameron, Prof. Caullery, Prof. Goebel, Prof. Gotch, Prof. Ludwig Graff von Paucsova, Prof. Holst, Dr. Horne, Prof. Keen, Sir J. Larmor, Prof. Leboucq, Prof. Sedgwick Minot, Prof. Nathorst, Prof. Nijland, Prof. E. E. Prince, Prof. Reddingius, Prof. Schaefer, Dr. Anthony Traill, Prof. Veit, Prof. Watts, and Dr. Smith Woodward.

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