

THE GEOGRAPHICAL WHO'S WHO\*.—The publishers have kindly sent us a useful book whose exact title 'Geographen-Kalender' is thus familiarly translated. One item of its contents that specially recommends itself to us is a list of the scientific institutions of the world arranged under heading of country, and then divided by subheadings, indicating the sciences they represent, *e. g.* the observatories of France, America, and other nationalities are all tabulated under one subheading. There must necessarily be some mistakes in a work of this kind, and we find Col. Tupman's observatory given in the American section; but some small errors do not much lessen the usefulness of the arrangement. There is a great deal more information of a kindred nature to this, an almanac, and tables of geographical data in measures of different nations. The frontispiece of the book, which is of German origin, is a portrait of Sir Clement Markham.

# NOTES.

COMET NOTES.—There seems to be no reason for supposing that the orbit of Brooks' Comet (*a* 1904) differs greatly from a parabola.

E. Strömgren gives the following elements in *Ast. Nach.* 3947, from observations extending from April 17 to 26; it will be seen that they are practically identical with Ebert's elements given last month (the latter were erroneously printed; the symbols  $\omega$  and  $\Omega$  should be interchanged):—

|              |       |                  |             |
|--------------|-------|------------------|-------------|
| T            | ..... | 1904 Feb. 28.813 | Berlin M.T. |
| $\omega$     | ..... | 50° 51' 30"      | } 1904.0.   |
| $\Omega$     | ..... | 275 17 36        |             |
| <i>i</i>     | ..... | 124 59 38        |             |
| log <i>q</i> | ....  | 0.42951          |             |
| <i>q</i>     | ..... | 2.688            |             |

## Ephemeris for Berlin Midnight.

| R.A.       |    |    |    | N. Dec. |    |             |                |
|------------|----|----|----|---------|----|-------------|----------------|
| h m s      |    |    |    | ° ' "   |    |             |                |
| June 3.... | 13 | 45 | 51 | 57      | 48 | June 19.... | 13 0 10 55 29  |
| 7....      | 13 | 32 | 15 | 57      | 22 | 23....      | 12 52 14 54 44 |
| 11....     | 13 | 20 | 8  | 56      | 49 | 27....      | 12 45 36 53 58 |
| 15....     | 13 | 9  | 27 | 56      | 11 | July 1....  | 12 40 11 53 12 |

Brightness 0.64 on June 3, 0.42 on July 1, that at discovery being unity.

On May 19 Strömgren's R.A. was 41<sup>s</sup> too great, his Declination 2'.2 too small, showing that his elements are not greatly in error.

\* 'Geographen-Kalender,' Zweiter Jahrgang 1904/05. Justus Perthes, Gotha. Price 4 marks.

Hence it appears certain that the supposed places of the comet on March 11 and 15, as published from Harvard photographs, do not belong to this comet, but to some other object or objects, for they are some  $6^\circ$  distant from the positions deduced from Strömgren's elements.

The large perihelion distance of this comet is noteworthy. In this respect it resembles the comet discovered by M. Giacobini a year and a half ago.

A. C. D. C.

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MINOR PLANET NOTES. — The following new planets are announced :—

| Planet. | Date.         | Discoverer. | Place.      | Mag. |
|---------|---------------|-------------|-------------|------|
| NZ .... | 1904 April 19 | Dugan.      | Heidelberg. | 13.2 |
| OA .... | 19            | "           | "           | 13.0 |
| OB .... | 21            | Wolf.       | "           | 13.2 |
| OC .... | May 7         | Dugan.      | "           | 12.2 |
| OD .... | 11            | "           | "           | 12.2 |

Planet 498 has been named Tokio, as this planet proved to be identical with FF, discovered by Hirayama in Japan in 1900. The designation seems particularly appropriate at the present time.

Permanent numbers have been assigned to recently discovered planets as follows:—LY 513, MB 514, ME 515, MG 516, MH 517, MO 518, MP 519, MV 520, NB 521.

The planets LZ, MC, MD, MF, MK, MM, MN, MQ, MR, MS, MT, MU, MW, MX, MY do not receive permanent numbers, not having been sufficiently observed; MI was cancelled as erroneous; MA, ML, MZ, NA are identical with 184 Deiopeia, 214 Aschera, 409 Aspasia, and 505 respectively.

The *Berliner Jahrbuch* for 1906 contains new elements of the interesting planet 475 Ocllo, by Prof. Kreutz.

The eccentricity of its orbit is 0.380, the greatest of the entire family. The least, mean, and greatest distances from the Sun are 1.60, 2.59, 3.58 respectively. The period is 4.162 years, so that six periods are almost exactly 25 years, and the most favourable oppositions are separated by this interval.

The *Berl. Jahrb.* contains the usual statistics about the minor planets: 361 of them have been observed at four or more oppositions, 29 at three, 43 at two, and 85 of them (not including the recent discoveries) at only one opposition. Of the planets numbered 1 to 200, five are missing, viz., 99 Dike, 132 Aethra, 155 Scylla, 157 Deianira, 193 Ambrosia.

Prof. Kurt Laves contributes a discussion of the orbit of 334 Chicago to the 'Decennial Publications of the University of Chicago.'

This is one of the interesting planets whose periods are nearly commensurable with that of Jupiter. It forms one of the so-called "Hilda" group, whose mean daily motion is about  $450''$ , that of Jupiter being  $300''$ . The other three planets of the group (viz., Nos. 153, 190, 361) have notable librations produced by Jupiter, but these are shown to be less marked in the case of 334. The author and Prof. Moulton are constructing tables of this planet, and give the first part of the computations. Incidentally they call attention to the desirability of rediscovering 132 Aethra, since its accepted period is almost exactly one-third that of Jupiter.

A. C. D. C.

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SUN-SPOT VARIATION IN LATITUDE.—Dr. W. J. S. Lockyer has lately communicated to the Royal Society a paper on this subject, but the point he makes is not entirely novel. The well-known law of Spörer states that a little before minimum spots appear far from the solar equator. After minimum they leave high latitudes, and the *mean latitude* of the spots seen on the Sun constantly diminishes with the next minimum. This law is quite borne out by observations, Dr. Lockyer agrees; but he says it does not state all the facts, and he draws curves to show that after a mass of spots breaks out in high latitudes, the mean latitude gradually gets smaller, but after a year or two there is another outburst in high latitude, and there is again a cycle of spots of gradually diminishing latitude, so that there are two or more of Spörer's cycles going on at the same time, and that to study the latitude of sun-spots properly it is not sufficient to take the mean of all the spots in each of the hemispheres, but that the solar surface should be divided into zones, each three degrees of latitude wide, and the mean latitude and the number and area of spots seen in each tabulated, year by year or rotation by rotation.

The fact of these double and triple cycles seems to result from the diagram published in the 'Mon. Not. R. A. S.' for June 1903, tabulating the Greenwich records of sun-spots. Anyone looking at the diagram can see apparent second and third outbursts in high latitude after the original one at minimum, but it is doubtful whether there is evidence for any other laws so well founded as Spörer's.

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THE GREENWICH VISITATION DINNER.—Unlike those of previous years, the card of invitation to the Greenwich Visitation this year bears no mention of a dinner to be held afterwards, when the Board of Visitors would meet the Astronomer Royal and his staff. There is some doubt about the exact date when the Members of the Board first met to dine, but there is record of a Visitation Dinner on 1817, July 12, at 4 o'clock, to which Mr. Pond issued invitations. The next record of the dinner, which may or may

not have been intermitted, is for the year 1837, and contains the entry: "9 watermen's dinners with beer and grog 22s. 6d." In those years the dinner was held at the "Crown and Sceptre," one of the Greenwich taverns, which at that time had great reputations, but in later years (about 1863) it became established at the "Ship." In the "eighties" the charm of a Greenwich fish dinner was on the wane, or possibly diners became more critical, but at all events the feeling arose that more satisfaction could be obtained elsewhere, and after a spasmodic attempt at improvement in 1888, when trial was made of another Greenwich hostelry, the dinner was held at the Criterion Restaurant, Piccadilly Circus, in 1891, and all years subsequent until last year. Up to about 1894, 40 or 50 persons, or possibly more, sat down, but the number at the table has gradually decreased, so that it has been thought advisable not to hold the dinner this year. Incidents of past dinners are difficult to collect, as of course no record is kept; but one who has been present on many of the occasions can recollect having seen many famous men at the board—Sir J. Herschel, Sabine, De Morgan, Whewell, Babbage, Sidgwick, Adams, Huxley, Lord Kelvin. Huxley is especially remembered as a brilliant and humorous chairman, whilst Prof. Pritchard generally contributed his share to the gaiety of the feast. For the most part the character of the dinner was staid and decorous. There was a time when smoking was not allowed at the table, but one can remember a certain noble lord, who was sitting as Chairman by reason of his position as President of the Royal Society, calling upon his right-hand neighbour for a song, and, the call being responded to, the proceedings became of a musical, not to say "free and easy" nature. But there is to be no dinner this year, and so—perhaps temporarily—an old-established custom passes away.

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THE VARIATION OF LATITUDE.—Year by year Prof. Albrecht publishes the results derived from the observations at the six stations established for the purpose of determining the variation of latitude. In *Ast. Nach.* No. 3945 he gives the results for the year 1903, with a diagram showing the motion of the Earth's north pole derived therefrom. As to this it may be said that the diagram is much as it was expected to be. The pole described an almost complete circular course of about 0".20 radius, similar to that of the years 1897, 1898, and in 1890, 1891. See diagrams in this magazine for 1895, March, and 1900, September.

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AN IMPROVED DIPLEIDOSCOPE.—This instrument may be defined by saying that it lies between the sun-dial and the transit-instrument. Its main principle is a right-angled prism properly adjusted, in which can be seen two images of the Sun when near the meridian—one seen by reflection from the first surface of the prism, and

another, very brilliant, being doubly reflected from the two inner surfaces. These images approached one another and coincide when the Sun is on the meridian.

The difficulties of the observation arise from the comparatively excessive brightness of the reflected image and from the fact that it is not easy to note the exact coincidence.

Sir Howard Grubb has overcome these difficulties by covering one half of the prism with a film of sulphide of lead so as to make the two images equal in intensity, and by adding a lens so that the images are thrown on to a screen. With an instrument recently exhibited, the solar images 2 inches in diameter moved relatively to one another at the rate of about one-thirtieth of an inch per second, so that it is quite possible to easily register time within one second.

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THE ROYAL SOCIETY CONVERSAZIONE.—Astronomy was represented at this function by Mr. Franklin-Adams' photographs of the Southern Heavens; by photographs and diagrams illustrating Solar and Meteorological changes and the determination of the relative temperatures of stars, exhibited by Sir Norman Lockyer. Transparencies of negatives taken with the Yerkes spectroheliograph by Prof. Hale and Mr. Ellerman were exhibited by the Royal Astronomical Society.

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THE following circular letter has been received from Prof. Cleveland Abbe, of the Washington Weather Bureau :—" You may have noticed that records have been published showing that an appreciable general diminution of the transparency of the Earth's atmosphere took place some time during the year 1902, but disappeared at some time during 1903. This is an important matter, and may possibly be made the basis of an explanation of other meteorological phenomena. I beg to ask whether you have any records that will assist in defining the dates of beginning and ending, and the extent of this change in transparency. Such records may consist of photometric or photographic observations of the brightness of the stars; changes in the solar or stellar spectra; unusual prevalence of halos, large Bishop's ring, or haze; observations of heat received from the Sun, as made with actinometers or pyrhelimeters; observations of the polarization of the blue sky light and of scintillation of the stars.

"Undoubtedly this diminution and increase of transparency began and ended at different dates at different places, as the phenomena spread gradually over the world during the years 1902 and 1903; additional records are therefore desired in order to trace its progress. Will you not kindly examine your records from this point of view, and send me the result for publication in a general article on this subject?"

A SMALL observatory has been opened at the Passmore-Edwards Sailors' Palace, Limehouse, for the use of the students of the King Edward VII. Nautical School, located at the institution. The equipment consists mainly of an 8-inch equatorial by Sir Howard Grubb, housed in a steel observatory, all of which was the gift of the late Lady Louise Ashburton, mother-in-law of the Marquess of Northampton, who opened the observatory on May 13.

PROF. G. H. DARWIN has been nominated President of the British Association for the Meeting in 1905, which will be held in South Africa.

M. G. BIGOURDAN, Astronome-Adjoint of the Paris Observatory, to whom we offer our congratulations, has been elected a Member of the Academy of Sciences in the Astronomical Section, in place of M. Callandreaux, who died last year.

PROF. G. H. DARWIN has been elected a Foreign Associate of the U.S. National Academy of Sciences.

THE next Meeting of the Royal Astronomical Society will be on Friday, June 10; of the British Astronomical Association on Wednesday, June 29.

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#### FROM AN OXFORD NOTE-BOOK.

WE had a great scene in Oxford on Tuesday, May 17. There has been a question of reform in the examinations in Theology. Hitherto the examiners have been necessarily clergymen of the Church of England, though men of all religious opinions are examined; and it was thought the time had come when this limitation might be removed. So, at any rate, thought the body of residents in Oxford before whom, in "Congregation," it is necessary to bring all important reforms in the first instance. But to confirm them as law the further approval is necessary of the much larger body of non-resident graduates who have kept their names on the books of the University, and the curious nature of this larger Oxford was sensationally exemplified on May 17. Coming to the Sheldonian Theatre (where, in expectation of a large assembly, the discussion and vote were to be taken) a few minutes after 2 o'clock, I found it scarcely possible to get inside. The floor was absolutely black with country clergymen, packed almost as close as they could stand. They had rushed up to Oxford in the belief that the Church of England itself was threatened, and made it very clear that they would listen to no persuasion to the contrary. When a mild supporter of the reform tried to explain it to them, they howled. So at last a vote was taken, and by 676 to 278 the base conspiracy was defeated and

the victors returned triumphantly to their country parishes. But there was something rather saddening in this sudden glimpse of the populace of a great University.

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TURNING over the leaves of Newman's 'Apologia' the other day, to see something of what Oxford was like, theologically, half a century ago, I was interested to find that his last point of contact with Oxford was the Radcliffe Observatory. Here is the passage :—

I left Oxford for good on Monday, February 23, 1846. On the Saturday and Sunday before, I was in my house at Littlemore simply by myself, as I had been for the first day or two when I had originally taken possession of it. I slept on Sunday night at my dear friend's, Mr. Johnson's, at the Observatory. Various friends came to see the last of me: Mr. Copeland, Mr. Church, Mr. Buckle, Mr. Pattison, and Mr. Lewis. Dr. Pusey too came up to take leave of me; and I called on Dr. Ogle, one of my very oldest friends, for he was my private Tutor, when I was an Undergraduate. In him I took leave of my first College, Trinity, which was so dear to me, and which held on its foundation so many who had been kind to me both when I was a boy, and all through my Oxford life. Trinity had never been unkind to me. There used to be much snap-dragon growing on the walls opposite my freshman's rooms there, and I had for years taken it as the emblem of my own perpetual residence even unto death in my University.

On the morning of the 23rd I left the Observatory. I have never seen Oxford since, excepting its spires, as they are seen from the railway\*.

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\* At length I revisited Oxford on February 26th, 1878, after an absence of 32 years.

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ASTRONOMERS cannot fail to take an interest in the growth of the National Physical Laboratory, if only for the reason that the nation is more or less following in the case of physics the precedent set in the establishment of a national astronomical laboratory. We call the latter by a different name, but there is much to be said for adopting the suggestion made by Professor Schuster (in his British Association Address to Section A in 1902) and re-christening our observatories as laboratories: for to observe phenomena is after all not the important part of the scheme—the observations are worthless unless we work at them. At any rate the differences between observatories and laboratories are becoming more and more ill-defined in these days of comparison-spectra and measuring-machines. An additional point of interest is that the astronomical precedent has been followed at the respectable interval of something over two centuries. What, I wonder, will be the new laboratory of two centuries hence?

The report of the Executive Committee for 1903 shows rapid development of the work, on which they are to be cordially congratulated; and anxiety about funds, in which many of us will be able to sympathize with them from experience. The number of tests

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made in nine months of 1902 was 269; and in 1903 this number increased to 1330. The staff, too, has increased from 26 persons to 34. But money is badly wanted both for the equipment, for the actual work, and for better salaries, only one salary exceeding £200 a year. It is to be sincerely hoped that the budding institution may be speedily put on a proper financial basis. Two points of special interest to astronomers and meteorologists are:—first, that the magnetic observations are to be transferred from Kew to Eskdaile Muir in Dumfriesshire, where “the Committee trust that the site may remain free from magnetic disturbance for many years to come”; and second, that there seems to be a possibility of inferring from experiments on models what the wind-pressure will be on structures of other dimensions, and a wind-tower is to be built to conduct the experiments.

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THE excellence of the Repsold registering-micrometer for transit observations has already been universally recognized, and there is no novelty in singing its praises. But each new proof of its value is worthy of remark, and the recently published determination of the longitude Potsdam—Greenwich presents such evidence very clearly and succinctly on pages 76 and 77. It gives one quite a new sensation to see a column headed “Personal Equation” filled with a uniform row of zeros in 3 decimal places, 0<sup>s</sup>.000; and to see the definitive result for personal equation stated as

$$0^s.000 \pm 0^s.005.$$

Even the beautiful residuals for the separate nights, rarely rising to 0<sup>s</sup>.02, which are very striking, take a place second in interest to this wonderful elimination of personal equation, which has not been bettered, if indeed it has been equalled, by any photographic method.

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ACCORDING to some other accounts, this beautiful instrument does not entirely obliterate, though it much reduces, personal equation. We must await further information before we can decide completely. But it would be quite in accordance with expectation if personal equation is found to be practically annulled. It was stated some years ago \* in these notes, and it has probably been maintained by others long before that time, that if we could employ *one* sense only, instead of *two*, in observing, personal equation would disappear. This troublesome systematic error arises from the imperfect co-ordination of two senses, whether seeing and hearing, or seeing and touch. The new micrometer needs the eye only.

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\* See *Observatory* for August 1897, p. 331.

It has been decided by the Council of the Royal Astronomical Society that henceforward each separate paper which appears in their 'Memoirs' shall be circulated at once, without waiting for others to form a volume. If we are not mistaken, this will be welcomed as a great convenience to workers; and the little extra trouble needed in collecting several papers to form a volume will not be grudged. This change is in a direction in which several important steps have already been made elsewhere: notably in the United States.

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MR. WILLIAM ELLIS, F.R.S., has been courageously attacking the false prophets. In Symons's *Meteorological Magazine* for April he contributes an article on "Some Weather Prophets," asking "how it happens that men, otherwise of considerable intelligence, can persevere in a task at present so utterly hopeless as the endeavour to predict detailed weather changes for long periods in advance?" Alas! the paradoxer is not likely to change his skin. He is, as he always was, often "otherwise of considerable intelligence," but none the less hopeless to argue with, and firmly convinced that men of science are banded into a conspiracy against him. One of those against whom Mr. Ellis has taken the field, in the next number hurls defiance and contempt at him and "scientific men, especially those connected with the Royal Society, the Greenwich Observatory, and the Royal Meteorological Society," who collectively show "great ignorance of the conditions of the weather problem as well as of the proper method of treating it." But he betrays the usual paradoxical anxiety for the good opinion of the men whom he professes to despise. After remarking somewhat incoherently that "Science admits no authority, no dogmatism, like that of Mr. Ellis and the Sun's heat," and that "A man like Mr. Ellis, who professes to believe that I predicted the weather correctly for 153 successive days by mere guessing, is capable of believing anything," he nevertheless goes on to put Mr. Ellis on to the judicial bench, or even above it.

Now I claim to have solved the problem of not only weather changes but also the incidence of great tides and earthquakes. In fact, I have found and proved by experiment that the atmosphere, the hydrosphere, and the lithosphere are tidally affected by the Moon and the Sun. And in order to establish this fact, I am prepared to predict the weather correctly by the tidal action of those great luminaries for any day or days in the future, if Mr. Ellis will be good enough to form a committee to adjudicate upon the result.—HUGH CLEMENTS.

I expect that, as the White King said to Alice, Mr. Ellis is *good* enough, but hardly *strong* enough, to form that committee. If he tried to catch anyone to form it, that alarmed person would "go by so fearfully quick" that "you might as well try to stop a Bandersnatch!"

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THE above reference to "Mr. Ellis and the Sun's heat," though a little vague, is obviously intended to be crushing. But Mr. Ellis may be comforted by the thought that if, against his will, he is associated with such regions of high temperature, he will be at least in august company, for a Great Personage has been dealing with the Sun's heat :—

#### THE GERMAN EMPEROR.

(FROM OUR CORRESPONDENT.)

BERLIN, Friday Night.

The Emperor William has presented to the German Department of the Spirit Exhibition at Vienna a prize in the shape of a picture, under which is written, in his own hand, the following inscription :—

"The treasures in the depths of the Earth are exhaustible, but the Sun causes to mature inexhaustibly, in the potato, light, power, and warmth."

To anyone acquainted with the conditions prevailing in the agricultural districts of East Prussia and Prussian Poland, where the farm labourers receive spirit as part payment of their wages, the Emperor's allusion to the reproduction of the Sun's heat in the shape of potato spirit will be especially appreciated.

And so the idea of the gradual dissipation of energy has, at any rate so far as the Sun is concerned, received its death-blow !

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It seems worthy of record that an astronomical analogy was used in the House of Commons on an important occasion. Mr. Black, Member for Banffshire, who on May 18 proposed an amendment which caused some sensation, is reported by the *Times* in one part of his speech as follows :—

The Prime Minister pursued the rôle of a political Nicodemus. While the right hon. gentleman was wobbling the ex-Colonial Secretary was working—with the result that unless he was stopped the Government would come to play the part of a political comet, in which the right hon. member for West Birmingham would be the head, and the Government the large and nebulous tail. (Laughter and cheers.)

After allowing for the nebulosity, I suppose the main implication is that a comet travels head foremost, dragging the tail after it. I wonder whether, in that august assembly which laughed and cheered, there was a single individual who knew that just as often as not the tail is in front ?

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THOSE who visit this year's Royal Academy Exhibition should take care to see the excellent bust of Halley (No. 1799), by H. Pegram, A.R.A. Judging from the several good portraits of Halley we have, the likeness is excellent, and the sculptor must have made the very best of his material. I believe the bust is to be presented by that well-known benefactor, Mr. Passmore Edwards, to the Free Library at Shoreditch, Halley's birthplace.