

THE new number of the Journal of the Royal Horticultural Society includes, besides papers on many other subjects, reports of conferences on the begonia and on apricots and plums. There is also a long series of extracts from the Proceedings of the society.

THE second part of the excellent "Canadian Guide Book," by Ernest Ingersoll, has been issued (W. Heinemann). It deals with western Canada, and the author has been at great pains not only to collect full and trustworthy information, but to present it in a clear and attractive style. There are maps and many illustrations.

THE results of an investigation concerning the nature and properties of metallic ruthenium, particularly with respect to the fusing point of this highly refractory rare metal, are contributed by M. Joly to the current number of the *Comptes Rendus*. M. Joly has accumulated no less than three kilograms of pure metallic ruthenium, and has consequently been enabled to carry out experiments upon it on a comparatively large scale. It will doubtless be remembered that ruthenium and osmium are the two most refractory of the metals of the platinum group. Deville and Debray only succeeded with great difficulty in obtaining a few minute globules of melted ruthenium with the aid of the oxyhydrogen blowpipe. The fusion of this metal is rendered very much more difficult owing to the readiness with which, at these high temperatures, it becomes converted into the volatile tetroxide RuO₄. It was apparent therefore that in order to attain success the temperature must be suddenly raised to a point considerably higher than the melting point of the metal; and in order to effect this a much more powerful source of heat than the oxyhydrogen blowpipe would be required. M. Joly has therefore employed the electric arc, which has recently been shown by M. Moissan to be so admirably adapted for the preparation of refractory metals. At the high temperature of a powerful arc ruthenium is melted in a few seconds, and without sensible loss by volatilisation in the form of tetroxide. Solid ingots of twenty to thirty grams of the metal have been obtained in this manner without difficulty. As the melted metal cools, however, it becomes covered with a coating of the blue sesquioxide Ru₂O₃ and the dioxide RuO₂. In order to remove this the ingot is placed first in aqua regia, which, however, has no action upon either the metal or the oxides, and subsequently in hydrofluoric acid; finally the ingot is heated in a stream of hydrogen, when it loses the last traces of oxide and the pure metal remains. Pure ruthenium thus obtained in tolerably large quantities after fusion is a greyish-white metal, more nearly resembling iron than platinum in appearance. Its hardness is about the same as that of iridium. It possesses a crystalline structure and is brittle. The density of the metal after fusion M. Joly gives as 12.063 at 0° compared with water at 4°. Employing the same electric arc and under equal conditions in all respects, the fusion of ruthenium appears to be attended with appreciably greater difficulty than that of rhodium and iridium, whose melting points are somewhat higher than the melting point of platinum. Moreover, under the conditions which suffice for the ready fusion of ruthenium, osmium merely sinters, traces of fusion being just apparent. Osmium therefore is the most infusible of the metals of the platinum group. M. Joly is now conducting experiments with the view of determining the actual temperatures of these interesting high melting points.

NOTES from the Marine Biological Station, Plymouth:—The week's captures include the Lucernarian *Depastrum cyathiforme* and numbers of the Gephyrean *Petalostoma minutum*, Kef. Ephyrae of *Aurelia* have been abundant; Hydroid medusae scarcer. Polychaete larvæ and *Nauplii* continue plentiful, and *Cyphonautes* (larva of the Polyzoan *Membranipora*

pilosa) has considerably increased in numbers. Echinoderm larvæ (*Auricularia*, *Pluteus*) have made their first appearance in the season's townnettings. The Nemertine *Nemertes Nesii* and a large eyeless mud-dwelling species of the Polychaete genus *Polydora* (*flava*, Clap. ?) are now breeding.

THE additions to the Zoological Society's Gardens during the past week include a Black-faced Spider Monkey (*Ateles ater*) from Eastern Peru, presented by Miss Gertrude Farmer; a Macaque Monkey (*Macacus cynomolgus*, ♂) from Java, presented by Mrs. Frank Phillips; a Naked-footed Owllet (*Athene noctua*) European, presented by Mr. Albert Stevens; a Four-horned Antelope (*Tetraceros quadricornis*, ♂) from India, purchased; six Wild Swine (*Sus cristatus*), two Badgers (*Meles laxus*), born in the Gardens.

OUR ASTRONOMICAL COLUMN.

COMET BROOKS (NOVEMBER 19, 1892).—The following is a continuation of last week's ephemeris for this comet:—

12h. Berlin Mean Time.

1893.	R. A. (app.) h. m. s.	Decl. (app.)	Log r.	Log Δ	Br.
Mar. 9	0 46 27 ... +20	46° 1'	0.1842	0.3563	0.47
10	47 22 ...	34'4"			
11	48 17 ...	23'0"			
12	49 11 ...	12'1"			
13	50 4 ...	20 1'5"	0.1946	0.3731	0.42
14	50 57 ...	19 51'5"			
15	51 49 ...	19 41'0"			
16	52 41 ...	19 31'2"			

This comet will soon be lost in the rays of the sun. The unit of brightness took place on November 21.5, 1892.

COMET HOLMES (1892, III.).—M. Schulhof gives the following ephemeris of this comet for the ensuing week:—

1893.	R. A. (app.) h. m. s.	Decl. (app.)
March 9	2 43 7.1	35 8 11
10	44 52.2	10 58
11	46 37.2	13 46
12	48 23.4	16 35
13	50 9.4	19 24
14	51 55.7	22 14
15	53 42.2	25 3
16	2 55 29.0	27 53

UNIVERSAL TIME.—On February 6 last the Bill declaring the legal time for Germany to be that of the 15th meridian east of Greenwich, that is, one hour in advance of Greenwich time, passed the third reading. This law will be brought into force on April 1. The *Observatory* for March informs us that, in a letter addressed to the Astronomer Royal, it is stated by Dr. Schran that a similar Bill has been laid before the Austrian Government, and "it is hoped that the change will be made simultaneously with Germany." The draft of the latter Bill, which we take from the same number, provides:—

(1) That the legal time in Austria is the mean solar time of the meridian 15° east of Greenwich. The same to replace, on April 1, 1893, the present local times for legal, civil, and all other purposes.

(2) The Government is authorised to make the changes in the school and industrial hours which will become necessary in consequence of the adoption of the above.

THE BIELIDS, 1892.—M. Bredichin, in *Astronomischen Nachrichten*, 3154, has a short note on the Bielids, in which he says that the observations made in America on November 23 last show that the meeting of the densest part of this swarm with the earth has taken place almost four days earlier than in the year 1885, or, in other words, that the descending node of the stream has receded almost 4° to the west during the period between the end of 1885 and the end of 1892. The cause of this recession is, he says, due to Jupiter, the perturbations set up by this planet accounting for the mean daily motion which is nearly equal to that possessed by Biela's comet.

An approximate computation of the special perturbations for the whole period during which Jupiter had any influence gave

for the recession of the node a little over 4° , the inclination decreasing about $0^\circ.6$.

THE WOLSHINGHAM OBSERVATORY.—In the Report of this observatory for the year 1892 Mr. T. E. Espin tells us that although the zone work was interrupted by attention being given to Nova Aurigæ, yet one hundred and sixteen new Third-Type Stars were detected in zones $+55^\circ$ and 56° . In the autumn, as the telescope was going to be devoted to the revision of double stars in connection with the new edition of "Celestial Objects for the Common Telescope," the driving clock was taken out and cleaned, and a new arrangement for letting the clock run for one and a half hours without rewinding was also added. Notwithstanding the pressure of work in this direction, as many as eight hundred and forty-seven measures were made in the autumn, "observing being carried on sometimes for twelve hours, and once for thirteen and a half at a stretch." With respect to the new edition of the work mentioned above, Mr. Espin gives a short description of the general scheme. The portions devoted to the planets and the sun (vol. i.) will have several foot-notes added to them, Mr. Denning will write a short chapter on comets and meteors, and chapters on celestial photography and spectroscopic work will also be inserted. The second volume will deal with double stars, &c., and will be entirely rewritten; the objects will be arranged in order of Right Ascension, and all double stars whose primaries are above 6.5 magnitude, and whose distance is less than $20''$, will be included. The work of bringing the places up to 1900 was at the end of the year completed for the first twelve hours, and considerable progress has already been made in the next eight hours of Right Ascension. Mr. Espin refers to the death of Miss Compton, who took great interest in the work done at the Observatory, and who left a legacy for the purchase of a photographic telescope. This telescope is already in working order, its aperture being eight clear inches, and focal length forty-two inches, and will be devoted to the photography of the zones observed with the spectroscope for detecting variation in light. The Meteorological Department has also been increased by a hygroscope and solar radiation thermometer, the gifts of Miss Brooke.

UNITED STATES NAVAL OBSERVATORY.—From the report of the superintendent (Capt. F. C. McNair) of this observatory for the year ending June 30, 1892, we gather the following few notes. In October, 1891, owing to the retirement of Prof. Asaph Hall, the use of the 26-inch refractor was tendered to Mr. Asaph Hall, junior, the latter observing the satellite of Neptune, satellites of Saturn, and the two outer satellites of Uranus. During the period of opposition of Mars, in August, 1892, the instrument was employed by Prof. Hall for the purpose of securing measures of the satellites, as the superintendent thought that "it seemed fitting that Prof. Hall, the discoverer of these satellites, should have the privilege of observing them once more under such exceptionally favourable circumstances." With the transit circle practically no observations were made, as the instrument was under repairs previous to being set up in the new observing houses; the Meridian transit, on the other hand, was in constant use, chiefly in connection with the time service. The 9.6 inch equatorial was as usual employed in observing asteroids, occultations, &c., while two nights a week were set apart for the accommodation of visitors. The number of visitors at night is about 2500 per annum, the majority of whom are women. In the estimates of appropriations required for the service for the year ending June 30, 1894, we see that the superintendent asks for an expert elevator conductor, which is essential to prevent accident. Among the estimates for the new observatory is a request for three dwellings for observers, and this is accompanied by a note which we print here, and the truth of which every astronomer will endorse:—"In order that the work of a large observatory may be properly and economically done, it is absolutely necessary that the observers be within prompt call to their instruments throughout day and night. Very important observations can often be secured from the clearing of the sky for a few hours, or even in some cases for a few minutes, if the observer be within easy call by the watchman. This can only be accomplished, in the isolated situation of the new Observatory, by having dwellings upon the grounds for the observers. The Government erects dwellings at all its navy-yards, arsenals, forts, and schools for the officers on duty there. But no service requires such unremitting attention and constant presence at all hours as that of the astronomer, and no observatory can be regarded

as economically managed which does not furnish dwellings for all its observers close by their instruments. It is estimated that with the observers living on the grounds of the new Observatory, not only will two or three times as much work be done as it will be possible to do otherwise, but the quality of this delicate work will be materially improved on account of the observers being in a proper physical condition to begin their labours, instead of with nerves unstrung from hurrying some miles from their homes immediately after meals, or at unreasonable hours of the night."

YALE ASTRONOMICAL OBSERVATORY.—Vol. i. Parts 3 and 4 of the publications of the Astronomical Observatory of Yale University contains (1) "A Triangulation of Stars in the Vicinity of the North Pole," by Prof. William L. Elkin; and (2) "Determination of the Orbit of the Comet 1847 VI.," by Miss Margaretta Palmer. With regard to the former paper, this was undertaken to determine the relative positions of some north polar stars to serve as fundamental points for a photographic survey of that region. Twenty-four stars, covering a considerable area, were selected for this work, and all the distances measured were large—that is, above $1000''$. Out of 276 possible combinations of measuring the intermutual distances within the range of the heliometer, Prof. Elkin managed to employ 146, each combination undergoing three separate measurements. In the reduction of the measurements he gives full information as to the methods employed, showing the means of eliminating the systematic errors, &c., concluding with tables of the final results in Right Ascension and Declination and precessional tables. Miss Palmer prefaces her determination of the orbit of comet 1847 VI. with a short reference to its discovery and history, remarking that it is probably the only comet ever discovered independently by two women. Rümker in 1857 found the orbit to be of a distinctly hyperbolic nature, and the result of the present determination, by employing modern places for the sun and allowing for perturbations, &c., show that the observations can be best explained on the hypothesis of the hyperbolic orbit, the new value for the elements differing slightly from the old ones.

GEOGRAPHICAL NOTES.

A COLONY only accessible through foreign territory is naturally unsatisfactory to its holders, and since the development of German South-west Africa, the inconvenience of having Walfish Bay as the only landing place for the interior has gradually increased. It is now announced that a new harbour has been found on German territory in the mouth of the Swartkop river. The stream is so small that it is marked on few general maps of Africa, and it may even turn out to be in the British sphere.

A PAPER for the next German Geographentag has been published in advance, by Prof. W. Köppen, under the title "Die Schreibung geographischer Namen." It deals in a very thorough manner with the principles which ought to regulate the orthography of place-names, and treats the whole matter of authoritatively published rules in a historical way from the first formulation of the Royal Geographical Society's Rules in 1885 to the new German rules (see NATURE, p. 89) adopted in 1892. Prof. Köppen has fully mastered his subject, and, from a thorough study of the phonetics of language, he has been able to formulate a scheme by which the Roman alphabet may be employed, with the aid of diacritical signs and groups of consonants, to represent almost every possible sound. The methods adopted in the official systems of the Royal Geographical Society and the German Colonial Office appear to the author of the pamphlet to be incomplete and unsatisfactory. The subject is one eminently adapted for full international discussion, and we hope that Prof. Köppen will not fail to bring the matter before the next international Geographical Congress.

POLAR exploration seems to have received a fresh stimulus, and we note with satisfaction the announcement in the American newspapers of Mr. Peary's new programme. He sails for Greenland in June, and will spend the winter not far from the site of his last winter's camp. A novelty in transport on the inland ice is to be the use of ponies shod with snow-shoes of a special pattern, experience in Alaska and Norway appearing to establish the practicability of the idea. The main object of the expedition is to survey the Arctic Archipelago immediately north of Greenland, and to determine the whole north coast of