slit was used, and he is able to divide the cometary bands into two classes—long and short. The long bands comprise the carbon bands at λ5165, 4737, and 4381, and the cyanogen bands at λ4216 and 3883, these last extending even further from the nucleus. Comparing this spectrum with those of other comets, he finds that comet 1912*a* (Gale) and comet 1911*c* (Brooks) are closely of the same spectral type as Zlatinsky's: this type he considers the more usual. Halley-Daniel (1907) is a type less common, and Morehouse (1908) a truly exceptional type.

THE SPECTRUM OF SILICON.—Those engaged in astrophysical researches will welcome the important paper communicated to the Royal Society (*R. S. Proc.*, Series A., vol. xc., p. 512, August) by Sir William Crookes on the spectrum of elementary silicon. Silicon plays an important part in the classification of stellar spectra, and the wave-lengths of lines attributed to this substance by different workers are by no means similar, and the number of lines recorded in the spectrum also vary for different observers. The discrepancies have chiefly arisen owing to the difficulty of obtaining pure silicon for laboratory purposes, but Sir William Crookes has recently been able to secure specimens of considerable purity, and so is able to record the results of his labours over eleven years on this one element in this communication. The specimens worked upon were obtained from the Carborundum Company at Niagara Falls, and gave on analysis 99·56, 99·86, and 99·98 per cent. of silicon, the impurities being titanium, iron, and aluminium. The use of these specimens has allowed the author to correct the lines given by other less pure samples, and to clear up other doubtful points. The paper gives a sketch of the procedure of treatment and the method of measurement of the lines, with, finally, a list of the lines attributed to silicon, with comparison tables of the wave-length determinations of other workers; it is to be noted that no intensities of the lines are given. The following is a list of the lines recorded:—

λ 3853·812	...	6346·962	...	2516·131
3856·193	...	6371·032	...	2519·276
3862·743			...	2524·110
3905·726	...	2124·163	...	2528·585
4089·016	...	2208·048	...	2541·970
4097·021	...	2210·987	...	2631·370
4128·189	...	2211·839	...	2881·690
4131·192	...	2216·882	...	2987·750
4552·841	...	2218·227	...	3086·479
4568·123	...	2435·212	...	3093·694
4574·823	...	2438·911	...	3247·684
5042·715	...	2443·484	...	3438·444
5057·832	...	2452·219	...	3796·364
5961·6	...	2507·055	...	3806·802
5982·0	...	2514·406		

THE TOTAL SOLAR ECLIPSE.—Attention is directed to the article in NATURE of July 16 on the eclipse of the sun which is to take place to-morrow. In the communication in question particulars are given of the various observing parties and the positions and duties assigned to them. The outbreak of hostilities must necessarily interfere with the programme therein sketched, *e.g.* the expedition which was to have been stationed near Kief has had to abandon its proposed work. According to the *Times*, Major Hills, president of the Royal Astronomical Society, has arrived in London from Russia, and Prof. Fowler and Mr. Curtis may be expected shortly. The party had considerable difficulty in getting away from Russia, having to travel from Riga to Copenhagen as deck passengers on a cargo steamer.

RECENT JAPANESE BIOLOGICAL PUBLICATIONS.[1]

THE papers here noted are reprints from the Journal of the College of Science, Imperial University of Tokyo, covering a period of five months, and do not by any means fully represent the output of the Japanese botanists and zoologists during this period, various other papers in natural history by Japanese workers having appeared in other journals—chiefly American. However, they form a fair sample of the large quantity and high quality of the biological work which is being done in Japan, and one is grateful to the authors and the publishing committee for refraining from publishing any part of this important journal—except a small part of the outer covers—in Japanese, which is, unfortunately, from the point of view of readers in other lands, still used in some other scientific journals published in Japan and usually without a summary in another language. The articles mentioned here are taken in order of numbering of the volumes to which they belong. The method of publication of the Tokyo science journal is to keep on starting fresh volumes before the preceding three or even four have been completed, instead of finishing off each volume as the various consecutive papers are published; the latter would certainly appear to be the better plan.

(1) Kinoshita gives a very detailed and beautifully illustrated description of the alcyonarian family Chrysogorgiidæ, as represented in Japanese waters, twenty species being dealt with, of which eight are new. He criticises the view put forward by Neumann and others that the stems and branches of the Gorgonid colony are mouthless vegetative polyps, and discusses in some detail the morphology of the canal system and the cœnenchyma in Alcyonaria generally.

(2) Koidzumi contributes a valuable monograph of the family Rosaceæ as represented in the Japanese Empire, with Latin diagnoses of the forty genera and nearly two hundred species now known, and interesting notes in English, with tables, showing the distribution of these plants. These tables are most useful, since they display the distribution of the subfamilies, genera, and species of Japanese Rosaceæ, not only in Japan itself, but in various parts of the world, statistics of endemic and introduced as compared with indigenous species, etc.

(3, 4) Liebwohl gives in these two papers a monographic account of the Tetraxonid sponges of Japan, illustrated by very fine plates. The material was collected by Prof. Ijima (who had already worked up the Hexactinellid sponges of Japan), and sent to Prof. von Lendenfeld, by whom the preparation of this monograph was entrusted to the author.

(5) Koketsu's paper on the latex-containing tissues of Japanese plants contains much that is of general interest, for not only is the structure of the laticiferous vessels full worked out and illustrated, but interesting micro-chemical and physiological experiments are described. After a useful summary of the various views that have been put forward regarding the functions

[1] (1) K. Kinoshita: "Studien über einige Chrysogorgiiden Japans." Journ. Coll. Sci., Imp. Univ. of Tokyo, vol. xxxiii., Art. 2 (November 30, 1913). Pp. 47+3 plates+34 text-figures.
(2) G. Koidzumi: "Conspectus Rosaceanum Japonicarum." *Ibid.*, vol. xxxiv., Art. 2 (October 28, 1913). Pp. 312+12 text-figures+8 tables.
(3) F. Liebwohl: "Japanische Tetraxonida. i. Sigmatophora; ii. *Astrophora metastrosa*." *Ibid.*, vol. xxxv., Art. 2 (March 15, 1914). Pp. 116+9 plates.
(4) F. Liebwohl: "Japanische Tetraxonida. iii. Fuastrosa; iv. Sterrastrosa." *Ibid.*, vol. xxxv., Art. 5 (March 20, 1914). Pp. 70+2 plates.
(5) R. Koketsu: "Studien über die Milchröhren und Milchzellen einiger einheimischer Pflanzen." *Ibid.*, vol. xxxv., Art. 6 (December 25, 1913). Pp. 57+3 plates+12 text-figures.
(6) K. Koriba: "Mechanisch-physiologische Studien über die Drehung der Spiranthes-Aehre." *Ibid.*, vol. xxxvi., Art. 3 (March 30, 1914). Pp. 179+7 plates+14 text-figures.

of latex, the author concludes that the latex tubes do not serve for conduction of useful organic substances, that such substances when present in latex are probably not utilised at all by the other tissues of the plant, and that the question belongs to ecology rather than to physiology, the chief functions of latex being essentially that of protection against animals, and in some cases that of closing over injuries to the plant.

(6) Koriba deals in this long and very detailed paper with the many problems raised by the curious flower-spike of the orchid genus Spiranthes, in which the inflorescence is so twisted as to bring the flowers into from one to three rows. The paper is of great general interest, since, in addition to his own exhaustive observations extending throughout the life-history of the plant from germination to flower development, the author discusses the general question of the arrangement of leaves and other lateral organs in plants, torsion and other displacements of organs, etc., with a very full bibliography of these aspects of general morphology, nowadays somewhat neglected by botanists. F. C.

ROYAL SOCIETY OF CANADA.

THE annual meeting of the Royal Society of Canada was held this year at Montreal on May 26–28, under the presidency of Prof. Frank D. Adams, F.R.S. The general and sectional meetings were held in the new medical building, McGill University, and in the Laval University, and there was an excellent attendance of fellows and of visitors. Dr. R. F. Stupart presided over Section III. (Mathematical, Physical, and Chemical Sciences), and in the absence of the president of the section, Prof. A. P. Coleman, Prof. A. H. R. Buller presided over the proceedings of Section IV. (Geological and Biological Sciences).

In his presidential address, Prof. Adams spoke on the national domain in Canada and its proper conservation. As a member of the Canadian Commission of Conservation, Prof. Adams was well qualified to review in all its aspects the national importance of the proper conservation of the natural resources of the Dominion, and he considered, in a comprehensive manner, agriculture, forests, water-powers, mines, fisheries, and the fur trade. By means of statistics and charts he described the manner in which the supplies of iron and coal were being exhausted, how the supply of merchantable timber, which is usually overestimated, is disappearing at a rapid rate, and the reckless destruction of the natural fertility of the soil brought about by growing only a single crop and bad farming. He indicated the manner in which the conservation of these resources was dependent upon the application of scientific methods to the various forms of production and the dependence of manufactures and transportation systems upon careful conservation. Conservation does not mean hoarding up, but development without waste. "Each generation," the president said, "is entitled to the interest on the natural capital, but the principal should be handed on unimpaired."

The president of Section III. (Dr. Stupart) considered in his address the present position of meteorological science. He contended that the success achieved in storm warnings and forecasts was ample warrant for the system, largely empirical, now in vogue in all civilised countries. The general international scheme for the exploration of the upper atmosphere was outlined and a comparison was given of the results obtained in Europe, Canada, and the equatorial regions. The present ignorance of many of the factors which lead to cyclonic and anti-cyclonic disturbances in higher latitudes was pointed out, and the factors concerning which more knowledge was available were described. In opening a discussion on the structure of the atom, Drs. A. S. Eve and J. C. McLennan considered the rapid progress in blending the Thomson electron rings with the Rutherford nucleus, Moseley's experiments on the atomic number with the isotopic theory of Fajans and Soddy, Bohr's views with the Rydberg number of Planck's quanta, and the hydrogen nucleus as positive electron, according to Rutherford's recent suggestion.

Among the series of important papers presented before Section III., the following may be mentioned. Prof. H. T. Barnes, in a paper on the expansive force of ice, showed that an ice-sheet over water expands and contracts similarly to a bimetallic rod, and results in the formation of peculiar cracks. An estimate was given from available data of the expansive pressure and the tensile strength of ice. Prof. C. J. Lynde described a new method of showing that soil solutions move through the soil by osmotic pressure from points of low concentration to points of high concentration. Dr. J. S. Plaskett discussed prism material for stellar spectrographs, and showed that a marked gain in efficiency, especially towards the ultra-violet, was gained by the use of lighter flint. He also described the new 72-in. reflecting telescope which is to be erected by the Dominion Government near Victoria, B.C. Dr. F. T. Shutt read a paper on the nitrogen compounds of rain and snow. For the year ending February, 1914, the eighth of the investigation, the total nitrogen furnished by precipitation amounted to 6·207 lb. per acre, and for the total period during which the inquiry has been carried on the average per annum is 6·182 lb.

A large proportion of the papers communicated to Section IV. were of a physiological character. Prof. A. T. Cameron described the distribution of iodine in plant and animal tissues. He showed from a wide series of iodine analyses that iodine is an almost invariable constituent of all organisms, plant and animal, the amount present depending upon the diet and mediums of the organism. With greater development there is greater specificity of the tissue concerned in storing iodine, until in the vertebrates no tissue except thyroid contains appreciable quantities. Miss D. Duff described the trematode, *Amphistomum subtriquetrum*, Rudolphi, found in the cæcum and colon of the Canadian beaver. This species was described by Rudolphi as a parasite of the European beaver, a fact of interest from the point of view of geographical distribution. Mr. L. Lambe described a new species of Aspideretes from Alberta, and a new species of Platysomus, noteworthy on account of its large size. Dr. C. Gordon Hewitt communicated the results of a series of observations on the feeding habits of the stable-fly, *Stomoxys calcitrans*, in which investigation the flies had been fed chiefly on human blood. Duration of feeding lasted from two to twenty-five minutes; the time required for the digestion of the whole meal varied from 49¾ to 95 hours. Prof. A. H. R. Buller described the subterranean parts of the fruit bodies of certain Hymenomycetes, such as *Collybia radicata*, *C. fusipes*, *Mycena galericulata*, *Coprinus macrorhizus*, etc., in which the extensions of the fruit bodies below the ground occur when the mycelia are deep-seated. Development is from below upwards, and a useful purpose is served in allowing the fungus to reach the surface of the ground before the spore-pilei are developed.

Instead of the annual popular lecture, illustrated addresses on popular subjects were given by representatives of the sections. Dr. L. G. Herdt, representing Section III., dealt with "The Development