is a faint continuous spectrum at the preceding edge of No. 386. The point chiefly requiring attention at present is the character of the line near 500. Many recorded observations describe this line as having a fringe of light on the more refrangible side, whilst others state that it is perfectly sharp on both edges. Low dispersion only should be employed in making this observation. The observation of continuous spectrum in a special part of the nebula 386 is also worthy of attention; the spectrum should be examined for maxima of brightness, as in the case of the nebula in Andromeda.

(2) Dunér records this as a star of Group II. (see below), but states that the spectrum is very feebly developed. The star is probably, therefore, either just condensing into a fully-developed star of Group II., or is just passing into Group III. If the former, there will practically be nothing but very narrow bands, and if the latter, absorption *lines* will accompany the bands. In the earlier stages of this group, the bands in the blue are strongest, whilst in the later stages red bands are strongest, and this point should also receive attention. As a check, the colour of the star should be noted at the time of observation.

(3) This star belongs to either Group III. or to Group V., and the criteria (see p. 20) should be observed in order to determine which.

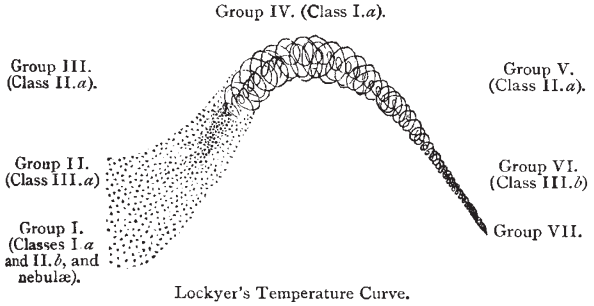
(4) According to Vogel, the spectrum of this star is of the same type as α Lyræ, *i.e.* Group IV. The relative intensities of the metallic lines and those of hydrogen, which vary from star to star, should be noted for future classification of the stars of this group according to temperature.

(5) This is a star of Group VI. Dunér describes the spectrum as consisting of four zones, the zones being the bright spaces between the dark carbon flutings. The presence of slight traces of carbon absorption in the solar spectrum indicates that stars of this group only differ in temperature from stars like the sun. The passage from one group to the other will probably be found to be very gradual, and the widths of the carbon flutings and the presence or absence of other absorptions should therefore be noted.

(6) Period given by Gore as 382 days, and magnitude at maximum (November 13) as 6·9–7·7. The spectrum has not yet been recorded, and the present maximum may, therefore, conveniently be taken advantage of.

(7) Period given by Gore as 168 days, and magnitude at maximum (November 15) as 8·3-9. Spectrum not yet recorded.

Note.—Lockyer's classification will, in future, be exclusively used, so that there will be no necessity for a double reference. The relation of this to Vogel's classification is shown in the following diagram :—



Lockyer's Temperature Curve.

The temperature increases from Group I. to Group IV., and then decreases to Group V. On the ascending side of the "temperature curve" we have probably to deal with condensing meteoritic swarms; and, on the descending side, with gradually condensing masses of meteoritic vapours.

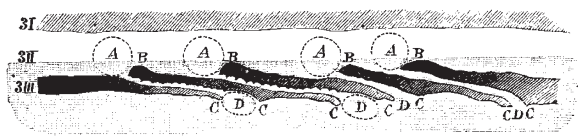
A. FOWLER.

LARGE-SCALE CHARTS OF THE CONSTELLATIONS.—Mr. Arthur Cottam has projected a series of thirty-six most excellent charts of the constellations from the North Pole to between 35° and 40° of south declination, and showing stars in half magnitudes down to 6½ by disks of various sizes. Although the primary object in constructing these charts was to make them companions to Webb's "Celestial Objects for Common Telescopes" and Smyth's "Cycle of Celestial Objects," their scope has been considerably enlarged, and a number of double, multiple, and variable stars have been laid down which are not included in either of the above-mentioned works. The Earl of Crawford's (Dun Echt) summary of F. G. W. Struve's Dorpat Catalogue included 2248 double and multiple stars, and of them, 2130 are shown upon these charts. In addition to this, 275 of the double stars discovered by Mr. S. W. Burnham have been mapped, this being the whole of those included in his first four catalogues, and a selection from his other catalogues. The maps have been drawn to a scale of one-third of an inch to a degree, which is a much larger scale than any hitherto published, and as each map includes but a small portion of the heavens, there is practically no distortion, whilst the epoch being 1890, the positions will hold good, without any serious errors, for fifteen or twenty years beyond that date. The projection is conical, or, in those charts which extend any distance both north and south of the equator, cylindrical. Hence it will be easy to lay down any additional objects that may be required. There is no doubt that these charts will be eminently useful, one of their great advantages being that they will enable possessors of telescopes mounted on altazimuth stands or without circles to find with ease a large number of interesting objects, and thus will help to extend the knowledge of the heavenly bodies and to popularize the most fascinating of sciences. We may say that the publisher of these charts is Edward Stanford, Cockspur Street, S.W., and that the first issue is limited to 200 sets, many of which have been already subscribed for.

BARNARD'S COMET, II. 1889, MARCH 31.—The following ephemeris is given in *Astronomische Nachrichten*, No. 2931 :—

1889.	R.A.	Decl.	1889.	R.A.	Decl.
	h. m. s.	° ′		h. m. s.	° ′
Nov. 6 ...	1 8 54 ...	−16 30·2	Nov. 22 ...	0 28 2 ...	−17 25·4
7 ...	5 49 ...	−16 37·2	23 ...	26 3 ...	−17 25·7
8 ...	2 49 ...	−16 43·6	24 ...	24 8 ...	−17 25·6
9 ...	0 59 53 ...	−16 49·5	25 ...	22 17 ...	−17 25·2
10 ...	57 1 ...	−16 54·9	26 ...	20 29 ..	−17 24·7
11 ...	54 13 ...	−16 59·8	27 ...	18 45 ...	−17 23·9
12 ...	51 29 ...	−17 4·1	28 ...	17 5 ...	−17 22·8
13 ...	48 50 ...	−17 8·1	29 ...	15 28 ...	−17 21·6
14 ...	46 15 ...	−17 11·6	30 ...	13 55 ...	−17 20·0
15 ...	43 44 ...	−17 14·8	Dec. 1 ...	12 25 ...	−17 18·3
16 ...	41 17 ...	−17 17·4	2 ...	10 58 ...	−17 16·3
17 ...	38 55 ...	−17 19·7	3 ...	9 34 ...	−17 14·3
18 ...	36 36 ...	−17 21·5	4 ...	8 13 ...	−17 12·0
19 ...	34 21 ...	−17 22·9	5 ...	6 56 ...	−17 9·7
20 ...	32 11 ...	−17 24·0	6 ...	5 41 ...	−17 7·1
21 ...	30 5 ...	−17 24·9	7 ...	4 29 ...	−17 4·4
22 ...	28 2 ...	−17 25·4	8 ...	3 20 ...	−17 1·5

THE STRUCTURE OF JUPITER'S BELT 3, III.—This dark band appears under ordinary conditions to be made up of two parallel bands, but Dr. Terby (*Astronomische Nachrichten*, No. 2928) says this appearance of parallelism is the result of the special structure represented in the accompanying figure, and



Structure of Jupiter.

that, therefore, the band 3, III., is composed of a lot of dark bands inclined in the same direction. The circular parts A are distinguished by Dr. Terby as emitting a sort of diffused light of an entirely different character from the white equatorial spots, properly so called; these luminous balls seem always to occur at the interval between two of the inclined bands, and touching what is generally their darkest part, B. The brilliant white spots D also appear at the dissolution of two successive bands, and occupy by preference their northern extremities. When the definition was very good, Dr. Terby observed that the interval between two of these fragmentary bands had the appearance of a series of globules, as shown in the figure. The structure appears so general and regular that it may be the means of adding considerably to our knowledge of the physical constitution of this planet.

GEOGRAPHICAL NOTES.

AT the first meeting of the session of the Royal Geographical Society, the paper was on Cyprus, by Lieut.-General Sir Robert Biddulph, G.C.M.G., C.B. The island of Cyprus is the third largest in the Mediterranean, being inferior in size only to Sicily and Sardinia. Its area is 3584 square miles. Its principal

features are two mountain ranges, running pretty well parallel to each other from east to west. The northernmost of these two ranges extends almost the whole length of the island from Cape Kormakiti on the north-west to Cape St. Andrea at the end of the horn-like promontory which stretches for 40 miles from the north-east of the island. This promontory is called the Carpas, and the low mountain chain running through it is called the Carpas range. The westernmost and higher portion of the northern range is called the Kyrenia range, and rises to an altitude of 3340 feet. This range is of a remarkably picturesque outline, in some parts extremely rugged. It is mostly a single ridge without any remarkable spurs, and its summit is about two miles from the northern coast. It can be crossed in many places. The chief mountain peaks of this range are Kornos, 3105 feet; Buffavento, 3140; and Pentedaktylos, 2400. The last named is a remarkably shaped rock in the centre of the Kyrenian range, owing its name to its shape, the word Pentedaktylos signifying in Greek "five-fingered." Beneath this rock there rushes out southward from the mountain side, at an altitude of 870 feet, a torrent of water, which never ceases to flow summer or winter, and which, descending into the great plain in the centre of the island, carries its fertilizing streams to the lands of several villages, its course marked by mills, gardens, and trees, until its water is exhausted by various irrigating channels. A similar stream of water gushes from the northern side, about 12 miles west of the Kyrenia Pass. Smaller streams descend on either side of the range at various places; their waters are used for irrigation in the valleys. The southern range of mountains is of a much more extensive nature than the northern range. The easternmost point of this range is the mountain of Santa Croce, so called from the church of the Holy Cross which stands on its summit. This mountain, which is 2260 feet in height, is of a peculiar shape. Beginning then from this point the southern range rapidly rises to considerable altitudes, finally culminating in Mount Troodos, the highest point in Cyprus, being 6406 feet above the sea-level. The other chief peaks in the southern range, are Adelphe, 5305 feet; and Machera, 4674 feet. But it is not only in altitude that the Troodos range is distinguished; numerous spurs run down to the north and south, and as we proceed further west these radiate out to greater distances, so that half way between Troodos and the sea, the mountain range is not less than 20 miles wide. Here there are very considerable forests, many miles in extent, rarely visited save by wandering flocks and by wood-cutters, and affording shelter to the moufflon, or wild sheep of Europe, some 200 or 300 of which still roam over these hills. On the map it will be seen that numerous rivers descend from both sides of the southern range. These are mostly dry in summer, but after rain their waters descend with violence, filling up the river-beds in the plains, carryiny away trees and cultivated patches, and often rushing in a turbid stream into the bays of Famagusta and Morphou. Between the two mountain ranges there lies a great plain called the Mesaorea, which is the most fertile part of Cyprus, growing large crops of wheat, barley, and cotton. It was evidently once the bottom of the sea, for in many parts are large beds of marine shells—gigantic oysters and others—all clustered in masses. A noticeable feature of this plain is the number of flat-topped plateaux of various sizes, where the rock seems to have resisted the action of the water. The tops of these plateaux are clothed with short herbage, affording a scanty provision for flocks, and are usually from 100 to 200 feet above the plain. The rivers which descend from the hills carry down large quantities of alluvial soil, and this forms in the eastern part of the Mesaorea a rich deposit, something similar to the Delta of the Nile. The two rivers which mainly contribute to this plain are the Pediæus and the Idalia, the former taking its rise from the northern slopes of Mount Machera, and the latter from the eastern slopes of the same mountain. The beds of these rivers have, however, become so choked up with alluvial deposit towards the end of their course, that their waters overflow the plain and mingle together, so that their separate mouths can with difficulty be distinguished. The normal condition of these rivers is to be without water, but whenever there is a heavy rainfall in the mountains, the river "comes down," as it is called, and runs for one, two, or more days. It occasionally happens that the water descends with great suddenness and violence, causing disastrous floods. Considerable supplies of water for irrigation purposes are obtained by sinking wells. A long chain of wells are sunk at distances of five or six yards apart, and being connected by underground galleries, a channel is thus formed which conveys the water to a reservoir constructed at the foot of the last well, and it is thence raised to the surface by a water-wheel; or in some cases the level of the ground admits of the channel being brought out on the surface. In this way the town of Nicosia is supplied with excellent water, which is brought in two aqueducts from a distance of some miles. Larnaca and Famagusta and other towns have similar aqueducts. Closely connected with the water supply is the forest question. Sir Robert Biddulph then entered into detail with reference to the denudation of Cyprus of its forests, and the great locust-plagues which have been so successfully treated since the British occupation.

THE FLORA OF CHINA.[1]

SINCE the last meeting of the British Association, two additional parts of the "Index Floræ Sinensis" have been published, bringing the enumeration of known, and the description of new, species as far as the *Loganiaceæ*. The Committee now, therefore, look forward with some confidence to the completion of their labours at no distant date.

Further extensive and valuable collections have been received from China in aid of the work, more especially from Dr. Augustine Henry, late of Ichang. The novelty and richness of the material obtained by this indefatigable botanist far exceeds any expectations the Committee could have formed. It is to be regretted that his duties as an officer of the Chinese Imperial Maritime Customs have necessitated his removal to Hainan. It is probable, however, that he had practically exhausted the immediate neighbourhood of Ichang, and that without opportunities of travelling over a wider radius, which the Committtee regret they were unable to procure for him, he would not have been able to add much of material novelty to the large collections already transmitted by him to Kew.

The Committee have met with the kindest sympathy and assistance in their labours from Dr. C. J. de Maximowicz, of the Académie Impériale of St. Petersburg, who has long been engaged on the elaboration of the collections made by Russian travellers in China, and from M. Franchet, of the Muséum d'Histoire Naturelle at Paris, who is describing and publishing the extremely rich collections made by the French missionaries in Yunnan.

The Committee have received striking proofs of the appreciation of their labours by botanists of all countries. They permit themselves to quote the following passage from a letter received early in the present year from Baron Richthofen, than whom no one is more competent to estimate the value of work connected with the scientific exploration of China:—

"It is of great value to have, now, a Flora of China, embodying all the species known from that country. You have evidently succeeded at Kew in getting a very complete collection. At the same time, in looking over the localities mentioned in the book, it strikes me that large portions of China are still unexplored botanically. There remains a splendid field for a good collector in the Tsingling Mountains, the province of Sz'chuen, and chiefly its elevated region west of Ching-tu-fu. Work in those parts will be greatly facilitated by the solid foundation laid through the work of Forbes and Hemsley."

The Committee derive an independent existence as a Sub-Committee of the Government Grant Committee of the Royal Society. They are at present in possession of sufficient funds to enable them to carry on the work. They do not therefore ask for their reappointment at the hands of the British Association.

SCIENTIFIC SERIALS.

American Journal of Science, October.—Assuming that the earth's crust rests on a layer of liquid as a floating body, Mr. Le Conte here offers an explanation of normal faults. The crust is supposed to be raised into an arch, by intumescence of the liquid, caused by steam or hydrostatic pressure; it is thus broken by long more or less parallel fissures into oblong prismatic

[1] Third Report of the Committee, consisting of Mr. Thiselton-Dyer (Secretary), Mr. Carruthers, Mr. Ball, Prof. Oliver and Mr. Forbes, appointed for the purpose of continuing the preparation of a Report on our present knowledge of the Flora of China.