

about half-way between it and that given by the "American Ephemeris." This was confirmed by observations made from a dirigible, and a captive, balloon, by MM. Fournier and Bourgeois near St. Nom-de-Bretèche, where the respective observers quite independently registered the passing of the shadow at the same moment.

M. Giacobini saw Baily's beads form a chaplet of brilliant points, three or four seconds after maximum phase, which rotated about the lunar circle 180° in eight or ten seconds.

Many bright chromospheric arcs are shown on M. Millochau's plates, taken with the large spectroscope at the Paris Observatory, but the attempt to photograph the green coronal radiation was not successful.

At his station near St. Nom-de-Bretèche, M. Puiseux saw the bright annulus complete, except for the breaks caused by lunar mountains, for about two seconds, and estimates that he was but slightly north of the true central line.

MM. Esclançon and Stephan, at the Château de Talmont (Vendée), recorded that the eclipse was neither total nor annular; Baily's beads appeared almost instantaneously. They, also, conclude that they were very slightly north of the true central line, and to an observer 4 km. further north the eclipse was palpably not central.

Interesting observations were made at the Lyons Observatory, where some 6000 kinematograph pictures were made of a screen on which the images of the sun and moon were projected, and on which a carefully rated watch was also hung. On an average, ten photographs were taken per second, and it is hoped to derive very exact times for the contacts from the results.

Encouraged by the fact that at Vavau last year he was able to see, faintly, the green coronal line two minutes after totality, M. Stéfaniak prepared to photograph the corona at Cormeilles-en-Parisis, using Wratten green-sensitive plates and suitable screens. But only the inner corona, as a very thin ring, is shown on his plate, and is easily distinguishable from the halation effect.

Prof. Iñiguez, at Madrid, found his observations seriously hampered by clouds, but succeeded in seeing, as very intense and long lines, the bright chromospheric radiations of H, Na, He, and Mg. Although the magnitude of the eclipse was only 0.9, he was able to observe the bright lines for some thirty minutes.

M. Eginitis, at Athens, observed the times of the contacts, and compares them with the predicted times as follows:—

	Observed			Calculated from the data of the Conn. des Temps Nautical Almanac		
	h.	m.	s.	h.	m.	s.
First contact ...	0	54	17	0	54	33.6
Last ,, ...	3	20	23	3	20	53.4

As in 1905, the observed are seen to be in advance of the calculated times.

An important series of observations was made by L'École Polytechnique at the suggestion of M. Hamy, and under the supervision of M. E. Carvallo. Equipped with field-glasses ($\times 8$), the students were echeloned in twos across the eclipse track along a line 12 km. long on the route between Trappes and Neauphle; successive pairs were separated by a distance of 1 hectometre, the idea being to locate exactly the central line and to compare the relative sizes of the lunar and solar discs. At the extremities and at the middle of the echelon photographic and kinematographic observations were made. The results show that the central line was situated 35.5 km. along Route No. 12 from Paris to Brest, and

lay between the lines predicted by the "Connaissance des Temps" and the "American Ephemeris," 500 m. from the former and 2400 m. from the latter. They also showed that the minimum diameter of the moon—between the valleys—was about 1.2" less than that of the sun, while the maximum diameter—including lunar peaks—was about 0.8" greater.

[In the article on the eclipse of the sun, in NATURE of April 25, for "disc" in line 23 of column 1 on p. 193 the author should have written "limb," and for 12h. 6m. 18s on the next line he should have given 1h. 31m.]

COLONIAL SURVEYS.¹

THE report of the Surveyor-General of New Zealand for the year ending March 31, 1911, has recently been published, and shows both a larger outturn and a decreased cost under most headings. Topographical survey shows the largest output of more than two and a quarter million acres, while nearly half a million acres were covered by the triangulation. The previous report referred to the urgent need for an effective major triangulation as a control for the very extensive network of minor triangles, and the present report shows work on triangulation of the second order as being done in the Wellington district, but apparently not elsewhere, except a new base-line in Taranaki district.

This base-line was almost ten miles long, and formed one of the sides of a polygon of the major triangulation. It was measured twice with each of two standard 100-link steel tapes belonging to the survey, thus giving four values for the length. The tape was supported and strained to a tension of 25 lb. in the same manner as a previously measured base which was described in the report of last year, and satisfactory results were obtained; the mean values of the two measurements with each of the two tapes differ only by 0.0445 link on a length of 79,605 links, and the probable error derived from the measurement of the sections of the base is given as being 1 in 5,142,370; the probable error of the base when temperature, standardisation, and such other sources of error are taken into account is not given. Three months were occupied in preparing the line, and forty-five days were occupied in the measurement which gave such good results. At the present time, when base measurement has been so much simplified and cheapened by the use of wires, this base seems long, and the time it required was considerable, but no doubt local reasons were against the use of a shorter base and a base extension network of triangles. Surveyors will regret the absence of technical details in this report, for they would be most interesting and instructive. The accuracy of the triangulation, the density of the points, and the rate of its execution in different districts could be easily included, and would give a far clearer idea of the work described, and the same may be

¹ Report on the Survey Operations for the year 1910-11. New Zealand Department of Lands. By J. Strauchon, Surveyor-General. (Wellington, 1911.)

Colonial Report No. 685. Annual. The Surveys of British Africa, Ceylon, Cyprus, Fiji, Jamaica, Trinidad, and British Honduras for the year 1909-10. Price 1s. 6d.

said of the standard traverses. The regulations of the department (1908) admit the same closure error, 20" for the triangles of both the major and minor triangulation; but doubtless in the new second order work the average error is much less.

Magnetic and seismographic records were regularly obtained at the observatory at Christchurch, and progress was made with the reduction of the observations of the magnetic survey, though no mention is made of an extension of the field work. The most important seismograph traces are reproduced.

Tide gauges are in operation at ten ports, and the methods of reducing the observations are discussed. To economise time and labour mechanical computation is largely employed, and mechanical plotting of coordinates with the aid of a co-ordinatograph is about to be introduced. In this connection we note the commencement of precise levelling at Wellington, but neither the instruments nor the permissible differences in the work are mentioned.

The report of the Colonial Survey Committee for the year 1910-11, dealing with the surveying work which is being carried out in the Crown colonies and in Ceylon, contains much interesting information, and shows a steady improvement in the quality of the work. The expenditure on land measurement and work connected with it in ten colonies amounted to about 65,000*l.*, besides about 80,000*l.* which was expended by Ceylon.

Everywhere the need for accurate surveys is felt, and in every colony where work has been done cadastral (landed property) surveys are in progress. For these a higher accuracy for control is needed than for topographical surveys, which are on smaller scales and do not deal with so sharply defined boundaries. The employment of trustworthy triangulation is steadily increasing, but still it is in progress in five only of the nine colonies which report that cadastral surveys are being carried on. For some colonies the accuracy of the work is stated, and triangular closing errors of 2" to 5" for second order triangulation and of 8" to 12" for third order triangles speak of excellent work done under conditions which are frequently most trying. There are some survey departments which do not report on the accuracy of their work in this way, and the value and interest of the report would be greatly increased if not only the angular precision were stated but generally the accuracy, the rate, and the cost of the different classes of work.

The number of control points available for the detail survey is also a matter of great interest to surveyors, and the interchange of such information on a systematic plan, as is done in the reports of the survey of Indian and of most foreign surveys, would be of much value. In Fiji a base-line 19,320 ft. in length was measured with a probable error of field observation of 1 in 4,000,000, but including errors arising from coefficient of error and temperature of the tape and of standardisation, the probable error of the base is put at 1 in 260,000. The stereophotographic method of sur-

vey is being employed here for plotting on the scale of 1 : 31,250 with 100-foot contours.

Cyprus appears in the report for the first time, and here a cadastral survey of the landed property in the island has been commenced, as required by the law passed in 1909 for the revaluation and registration of property in the land; it is based on a triangulation originally executed for topographical purposes, and will therefore need some revision to make it adequate as a control of the registration of small holdings. H. G. L.

NOTES.

THE first conversazione of the Royal Society for this year will be held in the rooms of the society at Burlington House on May 8.

DR. C. H. READ has been elected president of the Society of Antiquaries for the ensuing year.

WE regret to see the announcement of the death, on April 28, of Mr. J. Gray, honorary treasurer of the Royal Anthropological Institute and examiner at the Patent Office.

It is stated in *Science* that the late Prof. Abbott L. Rotch has bequeathed to Harvard University the Blue Hill Meteorological Observatory, which he established in 1885 and directed up to the time of his death. He has further provided an endowment fund of 10,000*l.*

ON Friday, May 10, the third May lecture of the Institute of Metals will be delivered by Sir J. Alfred Ewing, K.C.B., F.R.S., on "The Inner Structure of Simple Metals." Cards of invitation admitting to the lecture can be obtained on application to Mr. G. Shaw Scott, secretary of the Institute of Metals, Caxton House, Westminster, S.W.

THE annual dinner of the Society of Engineers (Incorporated) will be held at the Criterion Restaurant, Piccadilly Circus, W., on Saturday, May 11, when Mr. John Kennedy, the president, will take the chair. Among those who have promised to attend are Sir Wm. H. M. Christie, K.C.B., F.R.S., Sir David Gill, K.C.B., F.R.S., Sir Maurice Fitzmaurice, chief engineer to the London County Council, Mr. Alexander Siemens, past-president Inst.C.E., and Mr. H. P. Boulnois, chairman of the Royal Sanitary Institute.

THE Royal Meteorological Society will meet at Southport at the end of next week, by invitation of the Mayor and Corporation. On Saturday, May 11, a popular lantern lecture, "A Chat about the Weather," will be given by Mr. W. Marriott, and on Monday, May 13, there will be visits to the Marshside Anemograph Station and the Fernley Observatory, Hesketh Park, succeeded by a meeting of the society, at which the papers to be read are:—Results of hourly wind and rainfall records at Southport, 1902-11, by Mr. J. Baxendell; the south-east trade wind at St. Helena, by Mr. J. S. Dines.

DR. IRA REMSEN has sent in his resignation of the presidency of Johns Hopkins University, Baltimore,