A.D. 491, March 29, at 1h. 30m. Paris mean time

Moon's right ascension...	48	35	53
,, declination	+12	53	1
Hourly motion in R.A.			29·44
,, in Decl.			+7·39

The position of Aldebaran was in R.A. 47° 50′ 44″, Decl. +12° 10′ 15″. The sidereal time at mean noon at Nankin was 0h. 29m. 36s., and, calculating for that place, we find the star disappeared at 9h. 2m. local mean time, and would set at 9h. 14m., so that its altitude at disappearance was only 2°·3. Whence, assuming the accuracy of these computations, it is clear that the occultation could not have been seen as recorded at Nankin, if the moon's place about the epoch to which they refer were sensibly behind that deduced, so as to render possible an observation in twilight at Athens of the occultation of March 11, 509.

This result for the circumstances of disappearance of Aldebaran at Nankin in 491 reminds us of a similar observation made in London on the occultation of the same star, September 14, 1717, probably from the roof of the Royal Society's house in Crane Court, Fleet Street, whence, we are told, on the occasion of the total solar eclipse in 1715 there was a free horizon. "On the 14th of September, in the evening, for the first time the moon returned after a long interval to hide *Palilicium*; and the sky was extraordinarily clear at London, so that the moon and the star were seen to rise in the horizon at the same time; the immersion of *Palilicium* was at 9h. 6m. 20s., the moon not being 3° high, in the very middle, as it were, of the eastern limb, over against the northern part of that small *macula* which Hevelius called *Stagnum Mæridis*, and Ricciolus by his own name . . ."

BARNARD'S COMET.—A new computation of the orbit of this comet, by Mr. Egbert, of the Dudley Observatory, Albany, U.S., confirms that of Dr. Berberich, as regards the close approach which the comet makes to the orbit of Mars. At a true anomaly of 37° 35′, corresponding to heliocentric longitude 343° 52′ (equinox of 1884), the distance is within 0·008, the earth's mean distance from the sun being taken as unity, and a very close approach of the two bodies may have taken place, as before remarked, at the end of the year 1873. Dr. Berberich's period of revolution is 1958·9 days, that of Mr. Egbert 1970·3 days, an increase of only ten days on the latter period would suffice to have brought the comet and planet together in December 1873. The latest observation made by M. Perrotui, at Nice, in November, 1884, has not yet been brought to bear upon the direct calculation of the orbit, though Dr. Berberich's comparison of his elements therewith shows but small difference between calculation and observation. Barnard's comet does not quite attain to the orbit of Jupiter, the distance at aphelion being 0·555.

ASTRONOMICAL PHENOMENA FOR THE WEEK, 1885, APRIL 12–18

(FOR the reckoning of time the civil day, commencing at Greenwich mean midnight, counting the hours on to 24, is here employed.)

At Greenwich on April 12

Sun rises, 5h. 12m.; souths, 12h. 0m. 41·7s.; sets, 18h. 51m.; decl. on meridian, 8° 51′ N.: Sidereal Time at Sunset, 8h. 15m.

Moon (New on April 15) rises, 4h. 2m.; souths, 9h. 47m.; sets, 15h. 43m.; decl. on meridian, 3° 38′ S.

Planet	Rises h. m.	Souths h. m.	Sets h. m.	Decl. on meridian ° ′
Mercury ...	5 27 ...	13 7 ...	20 47 ...	18 0 N.
Venus ...	5 10 ...	11 41 ...	18 12 ...	5 26 N.
Mars ...	4 55 ...	11 15 ...	17 35 ...	3 13 N.
Jupiter ...	13 13 ...	20 30 ...	3 47* ...	14 1 N.
Saturn ...	7 46 ...	15 52 ...	23 58 ...	21 59 N.

* Indicates that the setting is that of the following day.

Phenomena of Jupiter's Satellites

April	h.	m.		April	h.	m.	
12 ...	2	1	I. occ. disap.	14 ...	22	43	III. occ. disap.
	23	22	I. tr. ing.	15 ...	2	22	III. occ. reap.
13 ...	1	41	I. tr. egr.		3	13	III. ecl. disap.
	20	29	I. occ. disap.	16 ...	0	0	II. occ. disap.
	23	50	I. ecl. reap.	17 ...	21	2	II. tr. egr.
14 ...	20	9	I. tr. egr.	18 ...	23	36	IV. tr. egr.

The Phenomena of Jupiter's Satellites are such as are visible at Greenwich.

April	h.		
14 ...	6	...	Mars in conjunction with and 0° 12′ south of the Moon.
14 ...	20	...	Venus in conjunction with and 0° 6′ north of the Moon.
16 ...	7	...	Mercury in conjunction with and 6° 21 north of the Moon.
17 ...	20	...	Mercury stationary.

GEOGRAPHICAL NOTES

THE Pescadores, which have recently been bombarded and occupied by Admiral Courbet, are a small group of islands lying in the Formosa Channel, about twenty-five miles off the west coast of Formosa. They are attached for administrative purposes to that island, and form one of the six districts into which it is divided. The islands are known to the Chinese as the Panghu-ting, or district of Panghu, and in Chinese geographical works more than thirty distinct islands are mentioned, but no distinction is made between the inhabited and uninhabited, large and small islands, nor between islands and mere rocks and shoals. The largest of the group is called Panghu, and from it the archipelago has doubtless derived its name. The main island is forty-eight miles in circumference, and the next in size, called Fisher's or West Island, is seventeen. According to the late Admiral Collinson, who surveyed it in 1845, the want of trees, which the Chinese officers accounted for by the violence of the wind and the absence of sheltered valleys, give the islands a barren appearance. Millet is extensively cultivated, and between its rows the ground-nut is planted. In sheltered spots the sweet potato and a few vegetables are grown, but the inhabitants depend mainly on Formosa for vegetables and fruits. Bullocks and poultry were abundant. The population of the two larger islands was stated then to be 5000, and of the whole of the islands 8000. The archipelago contains actually twenty-one inhabited islands, besides several rocks. They extend from 23° 13′ to 23° 48′ N. lat., and from 19° 16′ to 119° 37′ E. long. Their general appearance is flat, the summits of many of the islands being nearly level, and no part of the group being 300 feet above the sea-level. The two larger islands are situated near the centre of the archipelago, forming an extensive and excellent harbour between them. The capital of the whole—Makung or Macon—is situated on the north side of an inlet on the main island. The islands offer shelter in all states of the weather in the dangerous Formosa Channel. The archipelago was seized by the Dutch in 1622, and some remains of their fortifications are still to be seen; but in 1624 they left for Formosa, where they remained till finally driven out by the Chinese pirate Koxinga.

PORT HAMILTON, the English Naval Station in the North Pacific, acquired during the past week, is the name commonly applied to the large Corean island of Quelpart, situated about sixty miles due south of the extreme point of the Corean peninsula, and situated between 33° and 34° N. lat. and 126° and 127° E. long. It has been described at great length by Hamel, the "secretary" of a Dutch vessel wrecked there on its way to Nagasaki in the seventeenth century. Hamel and his companions were kept captive in Corea for thirty-five years, when some of them succeeded in escaping. Hamel's story will be found in Pinkerton and other collections of voyages. During the present century it has also been visited occasionally in search of the crews of shipwrecked vessels. A glance at the map shows its position relatively to Japan, North China, Corea, and the Sea of Japan, and its value as a naval station better than any words could do. It is 150 miles distant from Shanghai, about 100 miles from Nagasaki, and lies in the mouth of the only exit to the south from the Sea of Japan. It is described by Mr. Griffis, a recent historian of Corea, as an oval, rock-bound island covered with innumerable conical mountains, tipped in many instances by extinct volcanic craters, the highest of all being Mount Auckland, or Haura, which is about 6500 feet high. On the top are three extinct craters, within each of which is a lake of pure water, and Corean children are still taught to believe that the three first-created men of the world still dwell on these lofty heights. The whole island is well cultivated; there are a number of towns, three walled cities, but no good harbours. It has long been used as a place of banishment for criminals. The chief industry is the manufacture of straw hats, those from Quelpart being the best in Corea, which is a country of large straw hats. It has been

known from very ancient times, when it formed an independent kingdom. The origin of the great peak of Mount Auckland, which renders the island so conspicuous, is thus given by the inhabitants (we quote from Mr. Griffis): "Clouds and fogs covered the sea, and the earth trembled with a noise of thunder for seven days and seven nights. Finally, the waves opened, and there emerged a mountain more than 1000 feet high, and forty *ri* in circumference. It had neither plants nor trees upon it, and clouds of smoke, widely spread out, covered its summit, which appeared to be composed chiefly of sulphur." The fullest recent account which we possess is one published by a gentleman who visited the place with the French Consul in Shanghai in 1851, to seek for the crew of a vessel, the *Narwhal*, believed to have been wrecked there. The story of the visit was published at the time in an English journal printed in China. The inhabitants are Coreans of the ordinary type; iron appears to abound on the southern coast, and there were ample evidences of much comfort and even wealth among the islanders. Christianity is said to have reached Quelpart through a Corean, who made his way through North China to Hongkong, where he was taught by the missionaries, and who then made his way back to the island.

THE geographical subject proposed this year by the French Academy of Inscriptions for the Prix Bordin is "A Critical Examination of the Geography of Strabo." According to the terms laid down by the Academy, competitors are (1) to give the history of the text of the work; (2) to characterise the language of Strabo with reference to that of contemporary Greek writers, such as Diodorus Siculus and Dionysius of Halicarnassus; (3) to distinguish the information collected by direct observation of places and that drawn by him from his predecessors; (4) to express definite conclusions on his critical method in using various documents. The papers should be in the hands of the Secretary of the Institute not later than December 31, 1886.

THE Hungarian Society of Geography is engaged just now in organising a Magyar expedition for the exploration of the regions about the Urals, and principally of the Baskir country, where the Uralo-Altaic peoples are disappearing. The Society regards it as essential to study tribes which will soon be only a more or less confused recollection. The exploration is to be anthropological, ethnographical, and archæological.

THE Director of the Museum of Ethnography in Paris has just received from the Minister of Public Instruction a fragment of the planking of the canoe in which MM. Crévaux, Bellet, and Ringel were ascending the river when they were murdered on the Tejo-Picolmayo by the Tobas Indians. The Minister sent at the same time a collection of ethnographical water-colour drawings made by Ringel and annotated by Crévaux. These were recovered by M. Bueno, and sent to the French Legation at Rio de Janeiro.

IN the *Bollettino* of the Italian Geographical Society for March an attempt is made to determine the limits of the new "Kingdom of the Congo," as recognised by the late Berlin Conference, and modified by the treaty concluded between the African International Association, and Portugal on February 14. The territory as thus determined would be limited on the west by the Atlantic seaboard from Banana to Yabé (5° 45′ S. lat.), then by the parallel of Yabé to the meridian of Ponta da Lenha; then by this meridian northward to the Chiloango; then by the left bank of this river to its source, and beyond that point by a curved line to the Ntombo-Macata Falls on the Congo, leaving to the French the station of Mboco, but reserving Mucumbi and Manianga; lastly, from the Ntombo-Macata Falls the Congo itself to its confluence with the Bumba beyond the equator, where the boundary running north-west remains still to be determined. The southern frontier follows the Congo from Banana to a point a little above Nokki, the north bank remaining to the Association, the south to Portugal; then from near Nokki the parallel of this place as far as the river Kwango; then this river to about 9° S. lat., and thence a diagonal line across the continent to Lake Bangweolo. Eastwards the boundary coincides with the west coasts of Lakes Bangweolo, Tanganyika, Muta Nzighé, and Albert Nyanza. On the north the frontier will follow the line of water-parting to be hereafter determined between the Congo, Nile, Shari, and Benué (Niger) river basins. Within these limits the new State will have an approximate area of about 1,000,000 square miles and a population of probably 40,000,000, mostly of Bantu speech and Negro or Negroid stock.

THE same number of the *Bollettino* publishes a letter from Count Giacomo di Brazza, dated Brazzaville, October 22, 1884, in which the writer complains that his efforts to complete the triangulation of Stanley Pool were frustrated by the officer of the African Association, a certain Captain S., in charge of the left bank of the pool. To complete the work it was necessary to cross over to that side of the Congo; but the permission to do so was refused by the official in consequence of instructions issued by Colonel de Winton, "that all were to remain on their own side."

ON THE SALINITY OF THE WATER IN THE FIRTH OF FORTH[1]

IT is the purpose of this paper to state the methods employed for examining the salinity and alkalinity of estuary water at the Scottish Marine Station at Granton, and to describe and record six months' observations of the water of the River and Firth of Forth up to December 31, 1884.

(1) *Collection of Water Samples.*—To collect a sample of surface-water from a small boat it is sufficient to wash out the bottle with the water, and then hold it a few inches under the surface until it fills. The temperature of the water is taken by means of an ordinary thermometer in a copper case. On board a larger vessel the same thing may be done, the bottle being attached to a sounding-line and lowered over the side, or, without stopping the vessel, by means of a clean bucket, care being taken to draw the sample forward of the ejection-pipe of the condenser. When brought on board a thermometer is immersed for a minute, and the temperature noted. The water is then bottled, tied down, and labelled.

The water-bottle employed for obtaining samples from any depth beneath the surface consists of a brass basal disk supporting three radiating sheets of brass surmounted by a brass dome, on the top of which there is a ring for the line. The basal plate has an india-rubber ring fixed upon it, and its under surface has two rings for attaching the lead, and a stopcock for running off the water. There is also a brass cylinder, the edge of which rests upon the india-rubber ring when the instrument is closed.

On board the *Medusa*, the steam-yacht of the Marine Station, the water-bottle is attached to the sounding-line, which is wound on a drum worked by a small deck-engine. It has a 7-lb. lead attached to it, the stopcock is closed and a little plug screwed in to prevent the entrance of mud should it strike the bottom. It is then lowered, the slip-cylinder being held in the hand. When the desired depth is reached the slip is let go; it crashes down on the frame and is guided by the brass strips on to the india-rubber ring, on which it presses, and so firmly incloses a sample of water. It has been found necessary to let down one or two cylindrical weights, slipping on the line, after the slip has struck the body, in order to press it firmly down. Repeated trial and continuous use have shown this manner of water-collecting to be satisfactory.

The bottles used for preserving the samples are glass-stoppered, blue glass half-Winchesters, which hold about 1·5 litres. They are packed in boxes, fifteen in each, so as to be carried easily and safely. Each bottle is labelled as it is put aside, with particulars of the date, hour, and temperature.

The temperature below the surface is ascertained by means of the Negretti and Zambra thermometer in the Scottish frame, which was described to this Society in July, 1884 (*Proceedings*, vol. xii. p. 927).

When each sample of water is taken, the following observations are made and recorded:—Date; hour; position by bearings; depth of water;[2] depth from which sample was taken; temperature of the water at that depth; temperature of the air; nature of the weather, wind, and state of sea; state of tide; colour and transparency of the water.[2]

The colour of the water is observed by sinking a disk of iron, painted white, to the depth of a few feet or fathoms, according to circumstances, and noting its colour. The transparency may be very roughly measured by observing the distance to which the disk remains visible.

It is important that the actual notes of all observations be

[1] Abstract of a paper read at the meeting of the Royal Society of Edinburgh, January 5, 1885, by Hugh Robert Mill, B.Sc., F.C.S., Chemist to the Scottish Marine Station, Granton, Edinburgh.

[2] These are sometimes omitted in the case of surface samples.