

OUR ASTRONOMICAL COLUMN.

A NEW COMET (1907b).—A telegram from the Kiel Centralstelle announces the discovery of the second comet of the present year by Mr. Mellish, at Madison, on April 14. The magnitude of the object is given as 11.0, and its position at 10h. 20m. (Madison M.T.) on the day of discovery was R.A.=6h. 40m., dec.=+8° 0'.

A second telegram from Kiel states that the comet was observed by Bianchi at Rome on April 16. Its position at 8h. 22.1m. (Rome M.T.) was

R.A.=7h. 0m. 17.5s., dec.=+17° 19' 14".

This is about 2½° south of ζ Geminorum, and crosses the meridian at about 5 p.m.

A NEW NEBULA.—Whilst searching for new double stars on January 18, the Rev. T. E. Espin discovered a nebula in the constellation Perseus which he believes to have been previously unrecorded.

This object precedes B.D.+33°.746 by 7.80s., and is 2' 25" south of it, so that it lies somewhere about half-way between ζ and ξ Persei. It is about 6" in diameter, and is elongated towards the north, its brightness being about equal to that of a tenth-magnitude star. The later observations appear to suggest a planetary nebula with a small star on the northern edge (Monthly Notices R.A.S., vol. lxvii., No. 5, March).

COMET 1905 IV.—A further observation of comet 1905 IV. (1906b) is recorded in No. 4166 (April 5) of the *Astronomische Nachrichten* by Prof. E. Becker, who, with the large refractor of the Strassburg Observatory, saw it as a small round body, of about the tenth magnitude, on March 4. The observations of this comet now cover a period of about 2¼ years.

In the same journal Prof. Weiss gives a continuation of his ephemeris, extending from April 2 to June 5, which shows that the comet is apparently travelling very slowly through Libra in a north-westerly direction towards Virgo.

THE TEMPERATURE OF MARS.—Hitherto the chief obstacle to the belief that Mars is habitable by any such beings as inhabit the earth has been the extremely low temperature probably obtaining on the Martian surface, but in No. 25, vol. xlii. (March), of the Proceedings of the American Academy of Arts and Sciences, Prof. Lowell shows that, by taking all the phenomena into consideration, this obstacle may be removed. Previous calculations of the temperature have been deduced solely from the relative distance of Mars from the sun, and a recent investigation gave -33° F. as the mean temperature of the planet.

Prof. Lowell points out, however, that other factors, such as the relative albedoes of the planets, the screening effect of clouds, the blanketing effect of the atmosphere, &c., should be taken into account, and, on this basis, he finds that the mean annual temperature of Mars, if the heat were retained as well there as here, would be about 72° F. As the retention is greater in the case of the earth, this value is considerably reduced in the final calculation, taking all the known factors into consideration, and a mean temperature of about 47° F. is obtained. Prof. Lowell also finds that the boiling point of water on Mars would be about 111° F. (44° C.), that the amount of air per unit surface is about two-ninths that found in the case of the earth, whilst the relative density of the air at the surface is only about one-twelfth.

GALILEO IN THE VAL D'ARNO.—The April number of the *Monthly Review* contains an interesting article by Miss Janet Ross giving some details of Galileo's life whilst he dwelt near Florence, first as court mathematician and philosopher, then as a prisoner at the hands of the Inquisition. It was at a villa known as "Le Selve," near Signa, that he discovered spots on the sun and wrote his treatise on the planets, his history of sun-spots, and other works; whilst in a second villa in the neighbourhood, now known as the "Villa dell' Ombrellino," he wrote the "Saggiatore" and commenced his "Dialogues on Motion." After the persecution at Rome in 1633 he lived at Il Gioiello, Arcetri, and it was here that the Inquisition forbade him to converse with anyone, so that from that date until his death in 1642 he was an isolated prisoner, and for the last

four years was totally blind. Miss Ross also gives some interesting facts concerning the philosopher's family affairs.

ANOTHER NEW ASTRONOMICAL JOURNAL.—From the Società Astronomica Italiana we have received the first three numbers (January, February, and March) of its monthly bulletin, the *Revista di Astronomia e di Scienze affini*. The society was founded by Prof. Boccardi, of the Turin Observatory, in November, 1906, and has for its principal aim "the vulgarisation of astronomical conceptions." These bulletins contain original articles, astronomical notes, and reviews, together with ephemerides and notes concerning celestial phenomena for the succeeding month, and are published by the society at Turin.

THE STONYHURST COLLEGE OBSERVATORY.—Father Sidgreaves's report of the work done at the Stonyhurst Observatory during 1906 contains, in addition to some astronomical notes, the detailed results of the magnetic and meteorological observations made during the year. On the astronomical side, the sun was observed and drawings of the solar surface made on 212 days, and the large grating spectrometer was employed on the larger spots. For this work a new heliostat is being built which will carry a 12-inch mirror, and when the instrument is complete it will be possible to employ the full aperture of an 8-inch objective for use with the large Rowland grating in solar spectroscopy. Good spectrograms of Mira Ceti and some selected brighter stars were obtained during the year. The mean magnetic declination for 1906 was 17° 48' 3 W.

THE TWENTIETH YEAR AT BLUE HILL OBSERVATORY.¹

BLUE HILL OBSERVATORY on January 30, 1905, completed its twentieth year's work, and it is noteworthy that three out of its staff of four have been there at least eighteen years. Owing to the crowds of people brought to the hill by the electric cars, it was found necessary in 1905 to enclose the observatory by wall and fence, some of the secondary instruments having previously been moved for the same reason. Blue Hill is one of the few American observatories where the standard instruments have remained in the same position and with unchanged environments for so long a time, so that, except for the fact that the times of observation were changed to agree with those made by the U.S. Weather Bureau, the records are all strictly comparable. Since 1901 the observations have all been published in the metric units, English units being only used in parallel in the summaries.

The exploration of the upper air by means of kites carrying instruments which recorded continuously was first originated at Blue Hill in 1894. In 1901 the first observations over the North Atlantic were made by the director, Mr. A. L. Rotch, and Mr. Sweetland, using kites flown from a steamer. Kite observations are now made whenever possible on the days fixed by the International Committee for Scientific Aeronautics. These are generally the first Thursday in each month. In 1903, fifteen flights were made, nine of these being on days fixed by the committee. The average height reached was 2214 metres. In 1904, eight out of fourteen flights made were on appointed days, and the average height was 2300 metres. In 1905, sixteen days were assigned by the International Committee, and at Blue Hill flights were made on twelve of these and on four other days; the average height reached was 2120 metres. During the three years the maximum height reached was 4468 metres, or 14,662 feet. Since 1894, 280 flights have been made at Blue Hill.

In September and December, 1904, and January, 1905, at the St. Louis Exhibition Assman balloons were liberated with instruments. During the summer of 1905 another series of ascents was executed by Mr. Fergusson. Out of the thirty-five balloons liberated at St. Louis, thirty-two have been returned, most of them with records of pressure and temperature. The records show that fifteen balloons

¹ Annals of the Astronomical Observatory of Harvard College. Vol. lvi., part II. Observations and investigations made at the Blue Hill Meteorological Observatory, Massachusetts, U.S.A., in the years 1903 and 1904.

reached a height of more than 8000 metres (five miles). Two of them had travelled at a rate of 100 miles per hour. The maximum height reached was 17,037 metres, or nearly eleven miles, and the lowest temperature recorded was -79° C., at a height of 14,800 metres.

While Mr. Clayton was crossing the Atlantic to Gibraltar to join M. Teisserenc de Bort and M. Maurice on the cruise of the *Otaria*, he executed six kite flights, and on the cruise nineteen flights were made. From the Azores, Madeira, and Canary and Cape Verde Islands twelve balloons were sent up, and records were obtained of the wind velocity and direction up to altitudes of 13,600 metres. It was demonstrated that the upper return trade winds in the northern hemisphere blow generally from the south, and that the chief features of the vertical distribution of temperature and humidity were the differences between the east and west sides of the permanent anticyclone and the stratification of the atmosphere in the region of the trades and the doldrums (see NATURE, November 16, 1905, and March 8, 1906). These investigations are to be continued to see if the proximity of land influences the upper-air currents over the ocean.

In the tables giving the records obtained by the flights in 1903 and 1904 at Blue Hill, the reading corresponding with the different altitudes of the kites, are all compared with simultaneous readings made in the observatory, and the initial and final readings on the meteorographs are compared also with those at the station at the base of the hill. The height of the kite was determined from its angular height and the length of the wire, with a correction for sag. When the kite was not visible, its height was determined from the corrected readings of the barograph it carried.

In order to eliminate the effect of sluggishness of the instruments, the temperature readings were taken from the records at points which coincided with stationary points in the flight. Humidity was recorded by means of a hair hygrometer, which had been standardised by comparison with a psychrometer before and after the flight. The direction of the current in which the kite was flying was determined by the azimuth of the kite from the reel.

During 1902 and 1903 a long series of observations was made to study the effect of meteorological conditions on atmospheric refraction. From Blue Hill, Boston Lighthouse can be seen more than fourteen miles away, and the difference between the geodetic and observed dip of the line of sight observed three times a day. W. M.

SCIENTIFIC WORK IN THE STRAITS SETTLEMENTS AND CEYLON.

THE last number of the Journal of the Straits Branch of the Royal Asiatic Society is full of matter interesting to various classes of readers:—for botanists, Mr. H. N. Ridley's studies on the grasses, sedges, Scitamineæ, and Begonias of Borneo; for zoologists, Mr. P. Cameron's account of the Hymenoptera of Sarawak; for anthropologists, Mrs. Bland's description of the curious Anyam Gila basketry of Malacca, and Mr. Howell's Dyak ceremonies in pregnancy and childbirth, with a list of remarkable taboos imposed upon the woman before and after delivery; and, lastly, for folklorists, several tales collected by Messrs. Maxwell and Laidlaw. The most important contribution to the number is Mr. Ridley's article on the menagerie at the Botanic Gardens, Singapore. This was started by a local society in 1859, taken over by the Government in 1874, and, finally, the valuable collection was dispersed in 1903 on the ground that the authorities could not afford funds for buildings and a modest annual grant for maintenance. It is certainly a misfortune that this institution should have met such a fate. As Mr. Ridley points out, there are few places in the world better suited for a zoological garden than Singapore. Maintenance charges are low, and the vicinity of the source of supply renders it possible to procure specimens at a small cost. Mr. Ridley gives valuable notes on the various genera, and supplies useful hints on the methods of keeping animals in captivity. He lays down as a maxim that "the only way of knowing what an animal thinks is

comfortable and snug is to keep it and observe its ways. It will soon let you know what it likes, which probably does not at all fall in with your ideas of what it ought to like." His notes on the habits of the larger *Quadrumana* are based on first-hand knowledge. A pair of Indian jackals, he tells us, bred in the gardens, which is, to say the least, unusual. The Malay tapir (*Tapirus indicus*) displayed remarkable cryptic characters. When in its young pelage it hid in a palm bush, "and when I went to fetch it, on opening the bush and looking down, I could not see it. I seemed to be looking on the dark brown ground with spots of sunlight through the leaves. The little animal lay in such a position that the yellow spots were exactly where the vertical sun rays would fall, the yellow streaks resembling the slanting streaks of light from the side. It was for a few minutes quite invisible, though I was looking down on it." No. 47 of the journal of the same branch of the society is devoted completely to a Malay manuscript entitled "Hikayat Shamsu'l Bahrain," which, however, has no claims to special interest, being of a common type.

The address delivered by the Hon. J. Ferguson, president of the Ceylon branch of the Royal Asiatic Society, gives an interesting sketch of past and present scientific work in the island. In natural science the most valuable recent publication is that of Prof. Herdman, on the pearl oyster fisheries, with supplementary reports on the marine biology by other naturalists. The mineralogical survey has led to the discovery of many novelties, including thorianite, the only thorium-bearing substance to be found in any British possession. It is much to be regretted that the local government has been unable to provide funds for the establishment of an observatory, the want of which is much felt by the shipping trade, and was obliged to decline the offer of Mr. A. R. Brown, one of the Cambridge school of anthropologists, to undertake a survey of the Veddas. The suggestion made by Sir H. A. Blake, on native authority, that the connection between mosquitoes and malaria was known to Susruta, a Hindu writer of the fourth century A.D., has been examined by Prof. Jolly, with the result that the term Masaka cannot be confined to the mosquito, but includes various other insects popularly believed to cause disease. In regard to membership, the society is in a sound position. In spite, however, of the president's optimism, we gather that the supply of papers is not so large as might be desired, and that some of the enthusiasm which has revived the sister society at Calcutta is needed at Colombo.

AGRICULTURAL EXPERIMENTS.

WISCONSIN Experiment Station Twenty-second Annual Report.—From the time of Thomas Andrew Knight onwards, horticulturists have remarked the effects of an excessive food supply on variability in cultivated plants, but one seldom hears of a case in which such pronounced results have followed excessive feeding as those which occurred in an experiment described by Mr. E. P. Sandsten in the twenty-second annual report of the Agricultural Experiment Station of the University of Wisconsin. To a batch of tomato seedlings growing in a greenhouse a mixed manure consisting of 800 lb. nitrate of soda, 600 lb. sulphate of potash, and 1000 lb. bone per acre was applied. The seedlings soon began to vary, with the result that out of ninety-six plants scarcely any two were alike. Some plants were dwarfed, others developed internodes of abnormal length; the leaves varied in size and shape; the blossoms were abnormal in form; the stamens were much modified, and in one case became "almost aborted"; the pistils, on the other hand, were greatly overgrown, and some of the plants produced seedless fruits. Two seedless types, a large- and small-fruited, were specially noticeable, and cuttings of these and of some of the other marked variations were made. These were subsequently grown in an ordinary soil, and produced plants which retained all their abnormal characters.

Variation in the Composition of Milk.—In Bulletin No. 11 of the Edinburgh and East of Scotland Agricultural College, Dr. Alex. Lauder gives some interesting par-