

ASTRONOMICAL NOTES

Planets during February 1939.—Mercury will be visible as a morning star for a few days in the beginning of the month; on February 19, it is in superior conjunction with the Sun and will afterwards become an evening star. Venus is gradually moving towards the Sun, but will still continue to be a bright object in the eastern sky visible for some time before sunrise. Mars also can be seen about the same time near the meridian in the constellation Scorpio; and when it is near the first magnitude star Antares (α Scorpii) which is approximately of the same brightness and reddish colour, the two objects will present an interesting appearance in the morning sky.

Jupiter being too near the Sun, is not favourably situated for observation. Saturn is slowly

moving eastward along the southern border of the constellation Pisces, and will be visible towards the west for about three hours after sunset. The rings continue to widen and the angular dimensions of the axes of the ellipse are $37''\cdot5$ and $6''\cdot4$ respectively. Uranus is in the constellation Aries and will be an hour west of meridian at sunset. The following close conjunctions of the Moon with planets may be noted:—February 12, Mars; February 15, Venus; and February 25, Uranus. Lunar occultations of some interest that can be observed in these latitudes are— α Virginis (Spica), magnitude 1.2 on February 8 and β' Scorpii, magnitude 2.9 on February 11.

T. P. B.

SCIENCE NOTES AND NEWS

New Year Honours.—The New Year Honour list contains the following names of scientists:

Knighthood: MAJOR H. G. HOWARD, Chief Engineer for Electricity, Madras; COL. A. J. H. RUSSELL, I.M.S., Public Health Commissioner, Government of India.

C.I.E.: DR. W. BURNS, I.A.S., Agricultural Expert to the Government of India, Imperial Council of Agricultural Research Department; MR. H. B. DUNNICLIFF, Chief Chemist, Central Revenues Chemical Service and Principal, Government College, Lahore; LIEUT.-COL. G. COVELL, I.M.S., Director, Malaria Survey of India.

Rao Bahadur: MR. V. RAMANATHA IYER, Cotton Specialist, Coimbatore.

Rao Sahib: MR. M. G. PATHALE, Research Assistant in Botany, Agricultural College, Cawnpore; MR. SURJAKANTA MITRA, Assistant Professor of Physics, Science College, Patna.

O.B.E.: MAJOR D. P. BHARGAVA, Professor of Surgery, Prince of Wales Medical College, Patna.

M.B.E.: MR. D. C. CHAKRAVARTI, Professor of Clinical and Operative Surgery, Medical College, Calcutta.

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The Intensity of Solar Radiation.—The hourly and seasonal variations in the solar radiation at Poona, have been recorded in a recent publication of the Indian Meteorological Department (P. K. Raman, *Memoirs of the Indian Meteorological Department*, 1938, 26, Part VIII). The intensity of radiation coming from the sun and from the sunlit sky is a factor of fundamental importance in meteorology and in the study of bioclimatic phenomena. Long records of radiation measurements are confined to a few stations in Europe and North America. In India, work on this subject was started in 1934 at Poona, and the *Memoir* recently issued incorporates the data obtained for all the days for which the data were available in 1935.

The Moll solarigraph was employed for the measurement of the total radiation. The maximum amount of radiation recorded during the year was 855 gm. calories (May 4) and the minimum, 116 gm. calories (July 20). During the summer months, April and May, the mean daily radiation recorded was 784 and 775 gm. calories per day respectively. During the monsoon months, the energy is small, e.g., 388 gm. calories per day in July. The value changes to 600 in November, 478 in December and it steadily increases to the summer maximum.

The maximum radiation epoch occurs at noon during all the months. This epoch is not pronounced during the monsoon months.

It has been observed that a covering of the cirrus clouds does not affect, materially, the total radiation recorded on a horizontal surface. A sheet of cirro-stratus clouds decreases the total radiation by about 10 per cent., while a thick cirro-stratus diminishes the intensity by 20 per cent. Medium clouds cut off more of the incoming radiation.

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Mineral Production in India.—Among the chief sources of production of manganese in the world, India occupies the second place with 1,051,594 tons valued at £3,229,554 in 1937. Russia has the pride of place. The United Kingdom is the chief importer of Indian manganese ore. The industry has shown a gratifying recovery, and its output this year reached the peak point of 1927 (1,129,353 tons valued at £2,703,068). In 1933, the production had diminished to one-fifth of that of the peak year 1927, but its value was only one-twenty-second part of the value of the 1927 production.

The fall in the price of the manganese ore from 1924-32, is to be correlated with the fact that during the period 1924-27, the rate of increase in the production of manganese ore was much greater than that in the world's production of pig iron and steel. There was