

IN order to show French textile manufacturers that it is no longer necessary to purchase their machinery outside France, M. A. Renouard has an article of 69 pages in the May Bulletin of the Société d'Encouragement. It is well illustrated and shows that, since the War, French textile machinists have introduced improvements into spinning frames, looms, and other machines which place them in the front rank.

THE Department of Mines of the Queensland Geological Survey is issuing a series of reprints dealing with Industrial Minerals, giving a brief summary of the occurrences, treatment, uses, values, and production of these minerals, with special reference to Queensland resources. Nine of these pamphlets have been issued dealing respectively with salt, asbestos, mica, molybdenite, platinum, nickel, graphite, manganese, and arsenic.

IN the Annual Report of the Raffles Museum and Library, Singapore, for the year 1922, Major J. C. Moulton gives a list of 44 specialists whom he has induced to assist in naming the collections of the museum. Progress has been chiefly marked in the insect collections, and many papers describing new

species contained in them have been published. "As a result the museum is becoming more widely known as a *live* institution, and an increasing number of inquiries have been received from many distant parts of the world concerning the fauna of Malaya." It is to be hoped that this good work will continue in spite of Major Moulton's transference to a higher post.

REPORT No. 27 of the Industrial Fatigue Research Board records the results of investigations into the following industries: the textile, metal, boot and shoe, pottery, glass, and laundry, and into some repetition processes. It is thus a compilation by means of which the findings of different investigators in different industries can be conveniently compared. The various recommendations have been grouped under the following headings: (a) working conditions, (b) working methods, (c) administrative. It is only by the slow accumulation of data from many fields that generalisation of scientific value can be made. We are yet far from generalisation, but these studies show the direction in which available evidence points and suggest further developments.

Our Astronomical Column.

THE OPPOSITION OF MARS.—At midnight on August 22-23, Mars will be nearer the earth than it has been for more than a century. The conditions are, in fact, the best possible for a close approach. These conditions are attained when opposition occurs a week before Mars passes perihelion, from the fact that the earth is then nearer to its aphelion.

At these close oppositions, Mars considerably outshines Jupiter, and its ruddy light renders it a very striking object. It is 10° further north than in June 1922, so that the conditions for observation in England are not quite so hopeless as they were then.

Unfortunately, these very near oppositions have seldom been so fruitful in telescopic discoveries as those occurring somewhat later in the year. Thus Schiaparelli's work on the canals was mainly done in 1879 and 1881, though he was observing in 1877.

The late Prof. Lowell, whose long-continued scrutiny of the planet under all possible conditions adds weight to his opinion, explained this by August oppositions occurring at the dead season of canal development, when the supply of moisture from one polar region had exhausted itself, and that from the other had not commenced. It is interesting to learn that his widow is visiting Flagstaff; her presence will doubtless encourage the observatory staff to make the most of their splendid equipment. The 24-inch Alvan Clark refractor, and the seeing conditions at a height of 7000 feet in the Arizona desert, are universally admitted to be unrivalled. Prof. W. H. Pickering is remaining at Mandeville, Jamaica, until after the opposition.

SUN-SPOT ACTIVITY.—A noticeable feature on the sun's surface since August 1 has been a well-defined circular spot, in latitude 6° north, which passed through the centre of the disc between August 6 and 7. The history of this spot has been followed on the Greenwich photographs since July 9, when a large bi-polar group commenced to develop in a small area of faculæ seen at the east limb of the sun on July 6. The total area of the group reached $1/2000$ of the sun's visible hemisphere about July 13, after which the rear components disappeared, leaving the leader to continue uninterruptedly in the following rotation. No pronounced magnetic disturbance occurred at

Greenwich when the spot was near the sun's central meridian.

The period embracing a solar minimum is well known as one of transition; the passing cycle is represented by sporadic spots near the equator, whilst the spots of the coming cycle are appearing in higher latitudes (20° - 35°). The last solar minimum is now definitely concluded, and although small equatorial spots might have been expected, a spot group of this extent and length of life is remarkable. It will afford additional data for determinations of magnetic polarities at Mt. Wilson, which are of added interest at this phase of the solar cycle in view of the observed reversal of polarities.

TWO NOTABLE VARIABLE STARS.—The June Monthly Notices of the Royal Astronomical Society contain papers on the well-known variables Mira Ceti and β Lyræ.

The former is discussed by Dr. W. J. S. Lockyer, the star having been observed both for magnitude and spectrum at the Norman Lockyer Observatory, Sidmouth, last winter. The maximum was attained on January 29, in accord with Leon Campbell's prediction; the star was unusually faint, only rising to 4.9 mag., whereas it attained 2.2 mag. in 1906; it seems to have been the faintest maximum since 1886. The bright hydrogen lines were also feebler than usual; a discussion is given of their relative brightness. The more prominent dark lines were also studied, and indicated the presence of calcium, manganese, iron, aluminium, strontium, chromium, titanium. It was noted that there were several instances of the intervals between absorption lines having previously been mistaken for bright lines, and that apparently the only bright lines present are those of hydrogen.

Miss M. A. Blagg contributes a long paper on Baxendell's observations of β Lyræ, which ranged from 1840 to 1877. She concludes that the period is increasing, and gives the following formula for principal minimum: Julian Day $2398590.57 + 12.908 E + .0000037 E^2$. She also finds a subsidiary variation with a period of 6.576 days; the fact of its being so nearly half the principal period increased the difficulty of analysis.