

has been removed, this subject being now dealt with in the general chapter on staining, which has been re-written. The chapters on connective tissues, on blood and glands, and on the nervous system have been thoroughly revised and considerably amplified. Explanations relating to the principles of technical processes have been included in general chapters, and do not in this edition occur under the special sections.

#### OUR ASTRONOMICAL COLUMN.

**THE PLANET MARS.**—In No. 360 of the *Observatory* Mr. Wesley discusses the photographs of the planet Mars which Mr. Lowell recently published. Mr. Wesley has made a very careful study of the six prints, and has been able to distinguish easily, on one or another of them, the features named by Mr. Lowell. He is not, however, prepared to corroborate the opinion expressed by the latter that the photographs confirm the fact that the so-called "canals" are *continuous lines*, for imperfect definition might render a row of dots as an unbroken line. As the Lowell photographs are too small to reproduce satisfactorily, Mr. Wesley has made a composite drawing showing all the features seen on any of the prints, and this is given as a frontispiece.

In the same journal Mr. Denning gives, among other planetary observations, an account of his recent areographical researches with a 12½-inch Calver reflector, using a power of 300. He is very certain of the actual existence of the features termed "canals," many of which he was able to identify quite easily. He regards "canals," however, as an unfortunate designation for the irregular, frequently knotted streams of shading, which are by no means straight or narrow, but have a perfectly natural appearance, and says:—"The idea that they are clearly cut lines, suggestive of artificial origin, may be dismissed as a mere conjecture unsupported by reliable evidence."

Major Molesworth, of Trincomalee, Ceylon, has recently communicated to the Royal Astronomical Society a record of his observations of Mars during the opposition of 1903. These observations were made, under excellent conditions, with a 12½-inch Calver reflector, generally employing a power of about 450. An abstract of this paper, giving the principal tables and conclusions, appears in No. 8, vol. lxxv, of the *Monthly Notices*, accompanied by six beautiful drawings showing the chief characteristic features of the Martian surface during the opposition. As his results testify, Major Molesworth has made a long and laborious study of this planet with great zeal, and he has not the slightest doubt as to the reality of the "so-called canals." These markings do not, however, appear to him as continuous definite lines, but rather like "streaky" lines such as would be drawn on very rough paper with a rounded crayon or stump. He records several instances of gemination, and offers a natural explanation of the phenomenon. On six occasions he observed projections either on the limb or the terminator. In conclusion, he proposes a new classification of Martian features, and discusses the several "contrast" and "illusion" theories which have been opposed to the reality of the "canals." Likening these peculiar markings to those seen on Jupiter, he concludes that if the latter be accepted as real—as they undoubtedly are—then the similar ones on Mars cannot, on any logical basis, be ascribed to illusion.

**THE RINGS OF SATURN.**—Observing at Aosta (Italy) during the later months of 1904, MM. Amann and Rozet noted a novel feature on Saturn's rings. On October 20 M. Amann saw a sharp, accentuated marking, or shadow, on the rings some distance from the outer edge of the shadow cast by the planet itself, and having a curved form concave towards the planet. Between October 20 and November 15 this new feature was not seen, although numerous observations were made under favourable conditions. After November 15 the shadow was seen repeatedly, and it was then noticed that that part of it which was projected on the inner ring was always broader and more accentuated than the other part. Between December 22 and 27 it was seen that this broader portion was bifurcated, so that the whole shadow had the form of a

capital Y; that the apparition was a shadow was shown by its fixed position relative to the planet, notwithstanding the rotation of the latter and its rings (*Bulletin de la Société astronomique de France*, August).

**DECLINATIONS OF CERTAIN NORTH POLAR STARS.**—In No. 3440 of the *Astronomische Nachrichten* Dr. Auwers pointed out that in certain hours of right ascension, north of declination +82°, there were gaps containing no "fundamental" stars, and asked that these gaps might be filled. In answer to this request Miss Harriet Bigelow, of the Smith College Observatory (University of Michigan), has determined the places of twenty-one stars situated between declinations +84° 34' and +88° 55', and now publishes them in vol. vii. of the *Proceedings of the Washington Academy of Sciences* (pp. 189-249). The instrument employed was the Walker meridian circle, having a telescope of 6.3 inches aperture and a focal length of 8 feet.

**THE MINOR PLANET OCLLO (475).**—Another set of positions of the interesting asteroid Ocllo, as determined by Mr. R. H. Frost at Arequipa, are given in Circular No. 103 of the Harvard College Observatory. The object was re-discovered on, and its position determined from, a plate taken on June 6, and was also shown on other plates secured on June 7 and 9. The determined positions show that Ocllo seems to be about 4° from its position as computed from the previously published elements. The data now given, together with the positions published in Circulars Nos. 63 and 101, should enable the elements of Ocllo's peculiar orbit to be determined with great accuracy, and to insure against the future loss of this planet.

**THE ROYAL UNIVERSITY OBSERVATORY OF VIENNA.**—We have just received vols. xv. and xviii. of the *Annalen der k.k. Universitäts-Sternwarte in Wien*, edited by the director, Prof. E. Weiss. Vol. xv. contains a catalogue of 2417 stars the places of which have been determined by Herr F. Bidschof with the meridian circle, and are given for the mean equinox of 1885.0. The instrumental equipment and the methods employed in the reduction are discussed at length. A series of observations of Jupiter made between February 20 and May 1, 1898, by Herr J. Rheden is also described in this volume, and the description illustrated by fifty coloured drawings of the planet, which are given on the two accompanying plates.

Vol. xviii., in the first part, is devoted to the results obtained from the observations of minor planets and comets, made by Dr. J. Palisa with the Grubb refractor of 67 cm. (about 27 inches) aperture during the years 1899-1901. The observations of seven comets and four nebulae are included, and the whole of the results are tabulated at the end in a handy form for reference. This volume is completed by the meteorological results obtained in 1901, 1902, and 1903, the pressure, temperature, &c., being given for 7 a.m., 2 p.m., and 9 p.m. on each day.

#### THE STATE AND THE CLAYWORKER.<sup>1</sup>

IT is the purpose of each of these works to supply the members of the clay industry, in the State to which it refers, with an account of the geological relationships, the mode and place of occurrence, and the chemical and physical properties of the raw clays both worked and unworked. The manufacturing processes of various types of ware are also described as they are practised in the State, with numerous details of physical tests that have been applied to them.

The subject has been treated upon very similar lines in both reports; the Iowa volume, however, contains more information upon the practical manufacturing side; it devotes a chapter to the selection and upkeep of power plants, and has a fuller account of different forms of kiln; there is even a section dealing with the composition of the fuels used in burning the clays. But this volume

<sup>1</sup> "Clays and Clay Industries of Iowa." By S. W. Beyer, G. W. Bissell, I. A. Williams, J. B. Weems, and A. Marston. Iowa Geological Survey, vol. xiv. Pp. xi+664. (Des Moines: Iowa Geol. Survey, 1904.)

"The Clays and Clay Industry of New Jersey." By H. Ries and H. B. Kimmel, assisted by G. N. Knapp. Geological Survey of New Jersey, vol. vi. Final Report. (Trenton, N.J.: Geological Survey of New Jersey, 1904.)