

as a test for nitric acid. The lists are most complete, and so far as we have been able to refer to them are accurate, and are not confined to recent work; e.g. Beale's carmine stain and injection fluids are given. The volume will be of the greatest service in the chemical and the biological laboratory.

#### OUR ASTRONOMICAL COLUMN.

##### ASTRONOMICAL OCCURRENCES FOR SEPTEMBER:—

- Sept. 8. 20h. 46m. Jupiter in conjunction with the Moon (Jupiter  $4^{\circ} 56' N.$ ).
10. 17h. om. Saturn at quadrature to the Sun ( $90^{\circ}$  distant).
- „ 20h. om. Venus in the ascending node.
- „ 22h. 14m. Uranus in conjunction with the Moon (Uranus  $3^{\circ} 35' N.$ ).
14. 20h. om. Juno in conjunction with the Moon (Juno  $0^{\circ} 20' N.$ ).
15. 0h. 48m. Moon eclipsed, invisible at Greenwich.
16. 3h. om. Mercury in superior conjunction with the Sun.
22. 4h. 2m. Saturn in conjunction with the Moon (Saturn  $6^{\circ} 59' S.$ ).
23. 3h. 53m. Sun enters Sign of Libra; autumn commences.
- „ 8h. 22m. Mars in conjunction with the Moon (Mars  $5^{\circ} 6' S.$ ).
25. 0h. 7m. Neptune in conjunction with the Moon (Neptune  $5^{\circ} 0' S.$ ).
27. 8h. 34m. Venus in conjunction with the Moon (Venus  $1^{\circ} 21' S.$ ).
29. 16h. 46m. Sun eclipsed, invisible at Greenwich.
30. 12h. om. Saturn stationary.
- „ 13h. 2m. Mercury in conjunction with the Moon (Mercury  $2^{\circ} 36' N.$ ).

THE SPECTRA OF THE STARS.—After many years of patient labour by such pioneers as Rutherford, Secchi, Huggins, Vogel, Pickering and his co-workers, Lockyer and McClean, the subject of stellar spectra has attracted during the last decade the attention of an ever-increasing number of students in astronomy, astrophysics, physics, and chemistry. This is no doubt thanks in a great measure to the enormous number of spectra classified in connection with the Draper catalogue, but also largely to the simple nomenclature developed by Miss A. J. Cannon, further simplified by the suggestions of Dr. Hertzsprung. Although classification merely has received a great amount of attention of recent years, perhaps partly due to the prominence given to the matter by the Solar Union making it the work of a special committee, yet many important pieces of work have been accomplished beyond. Such are Campbell's and Kapteyn's work on the relations between radial velocities and type of spectrum, the similar work of Lewis Boss on the relation between proper motion and type, the work of Pickering and others on the distribution of stars of particular type of spectrum with reference to the Milky Way, &c. It is perhaps fitting that the importance of the subject should have led to the publication of a summary in the *Memoirs of the Society of Italian Spectroscopists*, No. 6, from the pen of Signor G. Abetti. It is, however, passing strange that this writer makes no mention of the work of Rutherford, Huggins, Lockyer, or McClean, except perhaps that some of them may be referred to in an "&c." Signor Abetti does not deal at all adequately with the literature on the chemical constitution of the stars. He does state, however, that titanium stars are on a level nearer to the helium stars than are the iron stars—a statement for which we know no justification.

#### EXHIBITION OF THE ROYAL PHOTOGRAPHIC SOCIETY.

THE Royal Photographic Society's annual exhibition at the Gallery of the Royal Society of British Artists, Suffolk Street, Haymarket, is well worth a visit by anyone interested in photography and its applications before it closes on October 4. Besides an excellent collection of works that are notable for their pictorial quality, and that will be examined by technicians as illustrations of the possibilities of the processes that they represent, there is a larger than usual number of colour transparencies, and also exhibits that are of specially scientific interest. The colour transparencies are chiefly autochromes, but there are many on the new Paget plate and a few "Dufays," both of which latter will quite well bear comparison with the autochromes for the quality of their colour and detail. In the scientific section, Lt.-Col. J. W. Gifford shows a large number of original photographs of spectra of the metals taken with a quartz optical train of large aperture. Mr. G. Reboul shows that cuprous chloride, produced by exposing a polished copper plate to chlorine gas, will furnish photographs by treatment somewhat similar to that employed in the production of daguerreotypes. The insecurity of intaglio plate printing for monetary documents is again demonstrated by Mr. A. E. Bawtree in his copies of stamps, the genuine stamp and the forgeries being indistinguishable. The photo-micrographic section is particularly strong. The method of discovering a difference in the colloids present in jams, and of detecting various adulterations, is excellently shown in a series of low-power photo-micrographs by Mr. E. Marriage. Of other series, the "Histology of the Optic Nerve of Sheep," by Mr. J. T. Holder; the "Corpuscular Elements of Human Blood," by Dr. D. H. Hutchinson; and Mr. J. M. Offord's "Diatoms under High Power," deserve special notice. There is a fine collection of radiographs by Dr. Bela Alexander, Dr. G. H. Rodman, Dr. Gilbert Scott, Dr. Robert Knox, and Dr. Thurstan Holland, some taken in a small fraction of a second. In this direction the most novel work is by M. Pierre Goby, who by the use of ultra-soft rays secures quite full details in the most delicate transparent membranes, such as insects' wings, at the same time as showing the internal structure of the insect. But more wonderful are his micro-radiographs, made by using the fine pencil of Röntgen rays that passes through a small hole in a lead screen. The detail in parts of small vertebrates only a fraction of an inch in length, is so well reproduced that a fifteen or seventeen times enlargement would be considered excellently sharp for a direct radiograph. M. Goby applies his method to foraminifera and other minute objects with similar success. Among the other exhibits there are a process with examples of a method of producing colour transparencies by the absorption of dyes in fish-glue, by Mr. Bawtree, and good collections of natural history photographs, lantern slides, and stereoscopic transparencies.

#### THE ARCHÆOLOGICAL INVESTIGATIONS IN THE MISSISSIPPI REGION.<sup>1</sup>

IN the publication referred to below Mr. Clarence B. Moore gives us another of his very careful descriptions of the systematic excavations he is undertaking in the Mississippi valley, and, as usual, it is profusely illustrated with most excellent photographs and coloured plates. By these investigations and the superb way in which he publishes his results, Mr. Moore is laying a sure foundation for future general-

<sup>1</sup> "Some Aboriginal Sites on Red River." By Clarence B. Moore. *Journ. Acad. Nat. Sci., Philadelphia*, xiv., 1912.