

contained a considerable amount of potassium salt as detected by the flame test. After four recrystallisations from distilled water, however, the purified salt contained only 0.01 per cent. of potassium chloride. A sample prepared and purified in the same way, except that caustic soda "pure by alcohol" was employed, contained 0.03 per cent. of potassium chloride, whilst four recrystallisations of a sample of "C.P." common salt gave a product containing 0.07 per cent. of the same impurity. The chief conclusion drawn is that although potassium chloride obstinately persists with sodium chloride, it can be removed by repeated recrystallisations.

A GREAT deal of information is contained in a paper on gas-firing boilers read by Mr. T. M. Hunter at the Institution of Electrical Engineers on November 22. Mr. Hunter believes that there is a great future for this method of firing boilers, despite the unfortunate experiences which have been the lot of many engineers in the past. Mr. Hunter's paper—which is almost a text-book on the subject—should assist engineers to understand and to obtain the proper conditions for economical gas-firing. In connection with the testing of results, the following extract is of interest:—"The apparatus for boiler control will cost a considerable amount, and it must not be overlooked that the best outfit of recording instruments is useless unless a constant and intelligent use of them is enforced absolutely. If, in addition to this, the boilermen and the man in charge of the boiler plant are given a premium for maintaining good results, boiler control will soon develop into a fine art, and prove an important source of revenue." We think that Mr. Hunter's remarks should be noted by owners of boilers. There are numerous cases where CO<sub>2</sub> recorders, pyrometers, etc., have been installed, and are practically ready for the scrap heap after a few weeks' life, when they have served much the same purpose as toys. On the other hand, if these instruments are kept in thorough working order, and if the workmen are taught to take an intelligent interest in their records, it is astonishing what improvements can be effected in the working of the plant.

WE have received a small booklet from Messrs. Watson and Sons (Electro-Medical), Ltd., of 196 Great Portland Street, W.1, entitled "The Sunic Record," dealing with some recent developments in the production of apparatus for the generation and application of X-rays. The work is edited by Mr. T. Thorne Baker, and is an interesting indication of present activity in the British electro-medical industry. In addition to the description of new apparatus the booklet contains an original article on the suppression of the "inverse" current in induction coils, notes on the X-ray examination of metal castings, radio-active paints, the Coolidge X-ray tube, reviews of books, etc. It is proposed to continue the publication monthly, and the proprietors undertake to send copies to those who will forward their names and addresses.

MESSRS. H. K. LEWIS AND CO., LTD., 136 Gower Street, W.C.1, have sent us a list of the new books and new editions added to their Medical and Scientific Circulating Library during July, August, and September. As the library contains upwards of 13,000 works dealing with medicine, surgery, astronomy, biology, botany, chemistry, electricity, engineering, geology, microscopy, mining, physics, philosophy, sociology, technology, voyages and travels, zoology, etc., and as any recent book of importance which may be applied for, if not already available, is added to it, it should be of great service to science workers. The list will be sent to any address on application.

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### OUR ASTRONOMICAL COLUMN.

THE TOTAL ECLIPSE OF THE SUN, JUNE 8, 1918.—The total eclipse of the sun on June 8, 1918, will be visible in the United States along a belt having a maximum breadth of sixty miles, extending from the State of Washington, through parts of Oregon, Wyoming, and Idaho, across Colorado and Kansas, and finally reaching Florida about sunset. The duration of totality will diminish from 2m. 2s. at the coast of Washington to less than half that amount in Florida. It is reported in *Science* (October 26) that Profs. Frost and Barnard have made a personal investigation of certain localities, and have decided upon Green River, Wyoming, as the principal station for the expedition from the Yerkes Observatory. Green River is situated between Cheyenne and Ogden, in the so-called Red Desert, and with a rainfall of about 10 in. per year, and an elevation of 6000 ft., it appears to be one of the most promising stations along the belt of totality. The transparency of the air on the day of the visit of the Yerkes astronomers is described as extraordinary. Denver is a possible observing station, but there appears to be some risk of cloud in the Colorado mountains on a June afternoon. It is probable, however, that a spectrograph from the Yerkes Observatory will be attached to the 20-in. equatorial of the University of Denver. Another site very favourably reported upon is near Matheson, Colorado, about sixty miles south-east of Denver, at an elevation of 6000 ft. On account of the war no British expeditions have been organised for observations of this eclipse.

REPORTS OF FRENCH OBSERVATORIES.—From the official report on the provincial observatories of France for 1916 it appears that a large amount of valuable work has been carried on, in spite of the serious depletions of staff which are recorded. Meridian observations, observations of minor planets and comets, and work connected with the astrographic chart of the heavens are prominent features of the reports. Considerable attention has also been devoted to terrestrial magnetism and meteorology. At Lyons M. Luizet has continued his important studies of short-period variables, and numerous observations of double stars have been made by M. Montangerand at Toulouse. The retirement of M. Coggia is announced by the director of the Marseilles Observatory; M. Coggia joined the staff of this observatory in 1866, and was the discoverer of seven comets, of which Comet VII. (1873) and Comet III. (1874) were especially notable.

STRUCTURE OF PLANETARY NEBULÆ.—An investigation of the internal movements and possible structure of the planetary nebulæ 6543 and 7009 of the N.G.C. has been made by Mr. W. K. Green (Lick Observatory Bulletin, No. 298). In each case several long-exposure photographs of the spectrum were taken with different orientations of the slit, so as to give the radial velocity at a large number of points. The central portion of each nebula gives direct evidence of rotation about the shorter axis, but the outer portions along the major axis seem to be rotating in the opposite direction, and some of the observed velocities follow no regular law. Photometric measurements of plates obtained with the Crossley reflector have been made, and curves are given showing the distribution of intensity along various diameters. Both sets of observations point to a rotating ellipsoidal shell as a possible form, but the luminosity curves which have been calculated for such forms are in disagreement with the observations as regards the major axis. An attempt is made to explain the reversal of direction of rotation at the outer ends by supposing that the central ellipsoid is surrounded by a fainter ellipsoidal shell or ring, which rotates in the opposite direction, but this hypothesis is not considered to be entirely satisfactory.