that the kinetic theory of gases allows us, from measurements of the viscosity or the heat conductivity of a gas, to calculate the mean distance of the centres of two molecules of the gas apart when the molecules are in contact, that the constant b of Van der Waals furnishes another estimate of the distance, and that the two estimates agree in giving about 2×10^{-8} cm. for the mean radius of hydrogen and helium molecules and about 3×10^{-8} cm. for the mean radius of the molecules of argon, nitrogen, oxygen, carbon dioxide, and other gases. With these figures as a basis, X-ray crystal analysis then gives the relative positions of the atoms in the molecule of the material analysed. So far the most careful analysis of crystals of potassium chloride has, however, failed to reveal any structure corresponding to the KCl molecule. Each K atom is surrounded by six Cl atoms at equal distances from it. For chlorides the distances vary with the metal in the molecule, are large, -3 to 5×10^{-8} cm., for the first elements of a "period," and decrease to a limit 1·3 to $2{\cdot}7 \times 10^{-8}$ for the last elements.

MANY methods of harmonic analysis have been given of recent years. We need mention only the methods of Perry, Silvanus Thompson, and Russell. The question has now come prominently forward in connection with the disturbances induced in telephone and radio stations by the harmonics in the currents carried by overhead power lines. The power station engineer wants the manufacturer to guarantee that the electric generator he purchases from him shall give a pure sine-shaped wave of electromotive force. As it is impossible to make the machine give an absolutely pure sine wave, limits have to be fixed on the magnitudes of the amplitudes of the harmonics in the wave. Hence harmonic analysis is a necessity. In the Journal of the Institution of Electrical Engineers (vol. lix., p. 491) Mr. A. E. Clayton gives a *résumé* of the ordinary methods and two schedules for "harmonic analysis" by means of selected ordinates. One goes to the 25th harmonic and the other to the 13th. In the one case the assumption is made that no harmonic higher than the 25th is present, and in the other that there is none higher than the 13th. Seeing that in actual electromotive-force waves there is an infinite number of harmonics present, and as only a limited number of ordinates are drawn, we should have little confidence in results obtained by a "schedule."

THE Cambridge University Press will publish shortly "The Calendar," by A. Philip, the purpose of which is to provide a concise and popular summary of the history and construction of the Gregorian calendar, with special reference to the reform of the calendar and the fixing of the Easter date.

Our Astronomical Column.

BRIGHT OBJECT NEAR THE SUN.—Prof. Campbell, Director of the Lick Observatory, reports by telegraph an object brighter than Venus that was seen on August 7 3° east of the sun and 1° south. The message states that there is no doubt of the object being a celestial object. It is either a comet or a nova. The former appears more probable, owing to the distance from the Galaxy, where most novæ appear.

VARIABLE STARS.—The Bruce 24-in. photographic telescope at Arequipa has been used for taking spectrograms of the Large Magellanic Cloud, in which Miss Leavitt some years ago detected several variable stars (Harv. Ann., vol. lx., No. iv.). Miss Cannon, in Harv. Bull. No. 754, gives the spectral type and magnitude range of eight of them as follows:—No. 884, Mc, 11·4m. to 15·5m.; No. 900, M, 12·2m. to 13·6m.; No. 2257, K5, 12·4m. to 13·2m.; No. 2435, K5, 10·8m. to 11·7m.; No. 2447, K5, 12·0m. to 12·8m.; No. 2622, K5, 13·2m. to 14·0m.; No. 2822, Mc, 9·8m. to 10·6m.; and No. 2882, Mb, 11·0m. to 13·6m. The numbers are from Harv. Ann., vol. lx. It is satisfactory to find that such faint stars are within the reach of spectroscopic analysis.

Mr. Stanley Williams contributed a paper to Monthly Notices, R.A.S., vol. lxxxi., p. 332, on the star B.D.+44·994°, which he announced as a peculiar variable, possibly of the Cepheid type. Miss Cannon gives its spectral type as Ma; and Miss Leavitt has identified 150 images of the star on plates taken during the last twenty years. Its normal photographic magnitude is 10·5m., but on seven dates it was 10·2m.; it is very red (Harv. Bull., No. 754).

C. Hoffmeister, director of Sonneberg Observatory, noted on May 30 last, while observing Reid's comet, an 8th magnitude star that is not in the B.D. Its position for 1855·0 is 7h. 57·0m., N. 58° 14′, and it is shown on the Harvard plates. Prof. Küstner has examined the original observations of the B.D., and finds that a star of 9·5m. was observed in the place on February 19, 1858, but not seen again, so it is probably variable (*Astr. Nach.*, Circ. 22). In the same circular H. Fuss announces that B.D.+42·3351°, 7·5m., has the large proper motion of +0·065s., +0·16″.

MR. FLINT'S PARALLAX OBSERVATIONS.—Publications of Washburn Observatory, vol. xiii., part 1, contains the details of the series of meridian observations for stellar parallax made at Washburn between 1898 and 1905 with the Repsold meridian circle of 12·2 cm. aperture, fitted with a travelling-wire micrometer.

The programme extended from declination $-35°$ to $+90°$, and embraced stars from magnitude 1·5 to 2·5, with some binaries and stars of sensible proper motion. A screen with thin metal slats rotating about their axes like the laths of a Venetian blind was used to equalise magnitudes, 7·0m. being made the standard. Two comparison stars, one preceding, the other following, the parallax star, were used in each case.

The mean probable errors of a single observation of unit-weight and of the final parallax of each star are 0·214″ and 0·031″ respectively. The last quantity is of about three times the size of the probable error in the best recent photographic determinations, showing that the meridian method cannot compete seriously with the photographic. Still, the experiment was well worth making, and the research will occupy a place in the history of the subject, so that it is well to have the details published. The list of parallaxes contains 124 stars, of which the deduced relative parallax is negative in thirty-five cases. The values for Algol and Castor, 0·122″ and 0·167″, are about three times the accepted values, while that of Altair, 0·071″, is only about one-third of it; but in many cases there is better agreement.