paratively little overlapping, has been analysed, an idea of its complexity being given by the fact that a resolving power of 180,000 was not sufficient to show all the existing fine structure. Each band consists of three groups of nine branches, the electronic transition being of the $^3\Pi-^3\Sigma$ type, and the usual information has been derived from the data for the size and other properties of the molecule. Consecutive lines of the branches have alternating intensities in the ratio of approximately two to one, thus showing that the nitrogen nucleus is spinning with unit angular momentum, a conclusion which has also been reached from the study of some bands of the ionised nitrogen molecule. In making this analysis, much assistance was obtained from the quantum theory of molecular structure, which, as with atomic spectra, permits of prediction of the types of terms and, for molecules, the details of rotational structure likely to be encountered.

Artificial Production of a Penetrating Nuclear Radiation.—Mr. Webster's observations on the secondary radiation produced in beryllium and other light elements by bombardment with polonium α-particles (*Roy. Soc. Proc.*, May; see also NATURE, March 12, p. 402) are an excellent example of the type of work which is usually required now to obtain new knowledge of atomic nuclei, and has only become possible through recent advances in technique with special precautions to eliminate spurious effects. The low efficiency of production of the secondary radiation, which ranges from 0·5 quanta per million α-particles for magnesium to 30 quanta for beryllium, is here aggravated by the small ionising power of the product; the intensity of the effect ultimately measured when this is cut down by screens to measure its penetrating power is very small indeed. A strong α-particle source is necessary, and the measurements must be made in a place free from serious radioactive contamination. Two detecting instruments, both highly sensitive, have been used, a Geiger-Müller tube counter and a high pressure ionisation chamber, the latter being usually preferred. The counter does not appear to be fulfilling the high expectations it aroused when it was first devised—at least in the form usually employed—and is usually described as somewhat erratic in action. The full interpretation of Mr. Webster's results must remain uncertain, until it can be decided how much of what he has observed is due to neutrons and how much to γ-rays, but his extensive experiments will certainly serve as a sound basis for future work.

Biological Test for Rhamnose.—Aldo Castellani and F. E. Taylor in 1917 described a 'mycological' method for the identification of various sugars and other carbon compounds, based upon the fermentations exerted on these substances by diverse species of *Monilia*. Castellani now describes a bacillus which ferments rhamnose with gas production, but does not produce gas from twenty-eight other substances tested; these included eight other sugars, six alcohols, two glucosides, inositol, dextrin, inulin, and several starches (*Ann. de l'Institut Pasteur*, T. 47, p. 297; 1931). This bacillus, obtained from human fæces, is a small aerobic, non-sporing, non-motile, Gram-negative organism which is named *B. rhamnosifermentans*. If this organism ferments a solution which reduces Fehling's solution, in all probability it contains rhamnose. The method employed is to prepare a sterile one per cent solution of the substance to be tested in peptone water in a Durham's fermentation or other tube, inoculate with the *B. rhamnosifermentans*, and incubate at 37° C. for four days; gas production indicates the presence of rhamnose. Suggestions are given whereby a mixture of sugars, etc., might be identified by the use of this and other fermenting organisms.

Astronomical Topics

Detection of Kopff's Comet.—Another of the numerous periodic comets due this year has been detected. Mr. Bobone found Kopff's comet at Cordoba (Argentine) in the following position:

	R.A. (1932·0).	S. Decl.	Mag.
May 25·0788 U.T.	$15^h\ 11^m\ 18{\cdot}8^s$	26° 11′ 12″	12

It is rather brighter than was expected. The concluded date of perihelion is Aug. 21·40 U.T.; this is $0{\cdot}24^d$ later than Mr. Kepinsky's prediction, and $1{\cdot}08^d$ later than Mr. Cripps's in the "B.A.A. Handbook". This comet was discovered in 1906, and seen again in 1919 and 1926.

Cometary Observations at Yerkes Observatory.—Prof. G. van Biesbroeck gives much attention to observations of comets, chiefly by photography with the 24-inch reflector. *Harvard Card* 189 contains a series of observations of Nagata's comet made by him during February, more than eight months after perihelion. It was of magnitude 15½ and had a faint coma, 25″ in diameter, with a central condensation. The positions indicate that the period of 267 years, found by Crommelin in the autumn, is somewhat too short, but the orbit is definitely elliptical, with a period of a few centuries.

A telegram distributed by the I.A.U. Bureau, Copenhagen, announces that Prof. van Biesbroeck detected Grigg-Skjellerup's comet on March 6 at $1^h\ 30{\cdot}3^m$ U.T. Its position for 1932·0 was R.A. $5^h\ 31^m\ 49{\cdot}3^s$, S. Decl. 5° 3·0′. Magnitude 16. This is the fourth observed apparition of the comet, the others being 1902, 1922 (when its periodicity was discovered), 1927. As the period is very close to five years, the circumstances of each return are nearly the same.

Distribution of Stellar Luminosities.—The distribution of absolute magnitudes for stars brighter than magnitude 6·0 has been investigated by Strömberg in a series of papers in the *Astrophysical Journal*. These have dealt separately with groups of stars within narrow limits of spectral type, using a valuable new statistical method which employs peculiar motions, parallactic motions, and radial velocities. He now summarises his previous results (*Astrophys. J.*, **75**, 115) and brings together on one diagram the luminosity curves for all the different spectral types. Several very interesting features which had been suggested in the earlier investigations now appear more definitely in the assembled results. The distinction between normal giants and dwarfs (or 'main sequence' stars) is, of course, evident; but the existence of an intermediate group ('faint giants') also appears for the types M_0 to F_0. At type A all these three groups merge together and carry on the main sequence to a maximum luminosity of −2·9 for early B stars. On the side of greater luminosity, two other fairly well defined sequences occur, termed respectively 'bright giants' and 'super-giants', which are found throughout nearly the whole spectral range. The latter attain absolute magnitudes as bright as −8 for early B stars. The gap between bright giants and normal giants is very definite, and the author suggests that this may represent a region of instability connected with cepheid variation and outbursts of novæ.