have been advanced, that which supposes the angular momenta of the effective electrons due to their intrinsic spins and their orbital motions to be separately quantised relative to the field axis is the most nearly correct, and further, that the orbital moments may be wholly or partially suppressed by the fields of neighbouring ions. Measurements were also made upon manganese ions, but in this case the conflicting theories all predicted the same result, which was actually obtained.

Reflection of X-Rays.—Some results of much interest in connexion with long X-rays are contained in three papers from Prof. T. H. Laby's laboratory, which appear in the September number of the *Proceedings of the Royal Society*. The first of these, by R. T. W. Bingham, contains a description of the construction and use of a compact vacuum spectrometer; this is of the Seeman single slit type, and was specially designed to give a high intensity of radiation at the photographic plate, together with accurate angular measurements. In the second paper, Mr. Bingham and Prof. Laby describe some investigations on the reflection and diffraction of soft X-rays. They find that these are reflected from surfaces of glass, quartz, and stainless steel at angles very much greater than the critical angle that would be expected theoretically. This fact increases considerably the range of angles for which gratings can be used with this radiation, and has been employed in some new determinations of relative wavelengths. It also permits of focusing of long radiation by a spherical mirror at large angles of incidence. The last paper, by Mr. Mohr, deals with certain details of the total reflection of long X-rays. Within the limits of experimental error, agreement was found between the observed and calculated values of the critical angle, and for the rate of fall of intensity near the critical angle, for the light substances quartz, calcite, and glass, but not for the denser bodies steel, silver, and gold, it being found that increasingly large discrepancies occur with increasing density of the reflector.

Inertia of Loud-Speaker Vibrating Diaphragm.—In addition to the theoretical difficulties of treating the many variable factors involved in loud-speaker design, there are also numerous experimental difficulties concerned in the laboratory measurement of the quantities. Following a treatment (*Phil. Mag.*, **11**, 1-54) of the theory and performance of certain types of modern acoustic apparatus for reproducing speech and music, Dr. N. W. McLachlan has now given an account (*Phil. Mag.*, **11**, 1137-1152) of five methods, each necessitating the measurement of the inductance of a coil situated in a magnetic field, of measuring the accession to inertia of a vibrating diaphragm driven by the reaction between the magnetic field and that of the alternating current in the coil. Three measurements of the inductance are made respectively with the coil fixed, free to move in air of known density and free to move *in vacuo*. In the free condition the value of the inductance depends on the effective mass of the moving system. When vacuum equipment is not available, the necessary conditions for the third measurement can be simulated by removing the diaphragm from the moving coil. Experimental arrangements and precautions necessary to attain accuracy are discussed in detail, and the importance of ensuring that the diaphragm move as a whole is emphasised. The results obtained for a conical diaphragm are in good agreement with those computed from Rayleigh's formula for a rigid disc. It is shown that with a limited size of baffle the accession to inertia decreases with frequency.

Astronomical Topics.

An Interesting New Minor Planet.—On the average three new minor planets are discovered every week, so such announcements are received with equanimity. But when the new object has an unusual rate of motion the case is a little different, for it implies either proximity to the earth or that the body lies on the outer fringe of the asteroid region. *Circular* No. 465 of the Berlin Rechen-Institut announces that a new planet designated 1931 *RA* was found by Herr Reinmuth at Königstuhl, which had the remarkably slow motion of -20^{sec} per day in R.A., and 1′ south in declination; this is slower than the usual rate of the Trojan planets when near opposition, as the new planet was. The motion was verified by another observation two days later. The slow motion may arise either from great distance or from the linear velocity of the planet being nearly the same as that of the earth. In either case the body is deserving of careful observation, so the positions are given as a guide to observers:

	U.T.	R.A.	N. Decl.	Mag.
1931. Sept.	7d 23h 49·1m	23h 38·9m	6° 34′	13·7
	9 21 59·5	23 38·2	6 32	

The second observation was a visual one, made by M. Mündler. The observation of minor planets is one of the principal lines of work at Königstuhl; the earliest image of Pluto that has yet been identified was found on a plate exposed there on Jan. 23, 1914.

Van Gent's Short Period Variable.—Reference has been made in this column to the variable discovered by Mr. H. van Gent in R.A. 8h 10·6m, S. Decl. 18° 45′, with a period of 100 minutes. It was noted that photographic study of the light changes was difficult, owing to the considerable variation during the time of exposure. Mr. Harold L. Alden contributes a paper on the star to *Astr. Jour.* No. 958: the star can be photographed at maximum with 2 minutes' exposure with the Yale 26-inch refractor at Johannesburg. Fifteen plates were taken on 11 nights, giving 56 exposures of the variable. The light range is from 14·05 to 15·12. The light-curve shows an extremely rapid fall after maximum (about 1 magnitude in 7 minutes). The curve is then nearly horizontal for about 40 minutes; the increase of light is fairly uniform for the remaining 53 minutes. In Cepheid variables the increase of light is usually more rapid than the decrease, so that this star differs notably from them.

A New Cluster of Faint Nebulæ.—Quite a number of clusters of faint spiral nebulæ have been detected in recent years. *Astr. Nach.* No. 5815 contains an account by Dr. W. Baade of a new one that he detected on plates taken with the large reflector at Bergedorf Observatory, Hamburg. Its position for the equinox of 1925·0 is R.A. 10h54·7m, N. Decl. 57° 11′, about half a degree from the star Beta Ursæ Majoris. It extends over a region some 24′ by 17′; the southern part of the region is filled by a densely packed cluster of very faint nebulæ (probably fainter than mag. 17). They are on the limit of visibility, and no structure can be detected. Dr Baade concludes that the nebulæ are considerably more distant than those of the other cluster, also in Ursa Major, that he announced a few years ago.