attractive forces between two one-quantum poles of opposite sign is almost 5000 times that between electron and proton, a result which may explain why a separation of poles of opposite sign has never been effected.

Estimation of Dissolved Metals.—In the September number of the *Proceedings of the Royal Society*, F. Twyman and C. S. Hitchen describe an improved spectrophotometric method for the estimation of metals in solutions. It consists in principle in the measurement of the intensity of a line from its length in the spectrum photograph obtained when a disc of special contour is rotated in front of the slit of the spectrograph during the exposure. Much attention has to be paid to details of procedure, such as the operation of the spark source of light and the development of the plate, but it appears that the necessary operations, which are described in full detail, are neither unduly laborious nor intrinsically difficult. The method, as given for minor constituents in solutions of metals, seems to have as great advantages as the corresponding method for the analysis of alloys; it is rapid, sufficiently accurate, and often superior in many respects to a chemical analysis, whilst the spectrogram gives a permanent record of the analysis.

Constitution of Cyanidin Chloride.—In a communication to the *Journal of the Indian Chemical Society*, vol. 8, p. 329, Dr. M. Nierenstein discusses the constitution of cyanidin chloride, a substance which is of interest both to chemists and to botanists on account of its relationship to the anthocyanidin pigments of flowers. Since cyanidin chloride breaks down on hydrolysis to phloroglucinol and protocatechuic acid, it is necessary to ascertain the mode in which the two nuclei of these products are linked in cyanidin. Willstätter ventured in 1914 to assign a definite structure to the latter compound, since it was supposed that it could be produced from the anthoxanthone quercetin by reduction. The fact that this reduction theory, though strongly favoured by Everest, Willstätter, and other chemists, appears to conflict with botanical evidence led Malkin and Nierenstein to reinvestigate the matter. These authors (*Jour. Amer. Chem. Soc.*, **52**, 2864; 1930) were able to show that reduction of quercetin leads to a dimolecular product, quercetylene chloride, and not to the monomolecular pentahydroxyflavylium chloride, which has the structure assigned by Willstätter to cyanidin chloride. It appears that both quercetylene chloride and pentahydroxyflavylium chloride have been identified with natural cyanidin chloride, but the evidence on which identity of composition is based is stated to be inconclusive. Furthermore, X-ray analyses of the natural cyanidin chloride and the synthetic product have revealed their dissimilarity. Thus there appears to be some doubt about the actual structure of cyanidin chloride. A possible solution of the problem, based on the fact that Freudenberg has reduced the compound to epicatechin, is tentatively suggested in the paper.

Astronomical Topics.

Detection of Neujmin's Comet, 1913 III.—Search for this comet has been going on for some months. A telegram from the U.A.I. Bureau, Copenhagen, on Sept. 26 announced that Dr. Nicholson, at Mount Wilson, had found it in the following position:

Sept. 17^d 12^h 18·0^m U.T., R.A. 4^h 43^m 48^s, N. Decl. 38° 29′, Mag. 15. Daily motion +40^s, N. 9′.

It was stated that there was no nebulosity; this was frequently the case in 1913.

This position and the motion are satisfied within 1′ by the following elements, which are from the B.A.A. Handbook for 1931, with adjustments to period, eccentricity, and date of perihelion:

T	1931 April 29·98 U.T.	
ω	346° 57′ 48″	1931·0
Ω	347 18 10	
i	15 9 3	
ϕ	50 47 54	
log q	0·18415	

Period 17·689 years.

EPHEMERIS FOR 0^h U.T.

	R.A.	N. Decl.	log r.	log Δ.
Oct. 2.	4^h 49^m 43^s	40°40′	0·3712	0·2566
10.	4 49 32	41 45	0·3828	0·2514
18.	4 46 31	42 42	0·3942	0·2475
26.	4 40 58	43 27	0·4054	0·2460

This comet must be ranked as belonging to Saturn's family; its orbit makes a close approach to that of Saturn in the region passed by the comet after aphelion. It is the second member of the family to be observed at a second apparition. Tuttle's comet has been observed at seven apparitions.

Collapsed Stars and Novæ.—Prof. E. A. Milne suggested, in the *Observatory* for May, that novæ are the result of the collapse of a star of ordinary density. This collapse may produce rotational instability and cause the star to split into two portions. These may then re-expand, which would give an ordinary binary star. A system like that of Sirius might result if the larger star re-expanded, while the smaller one retained its high density. The very great disparity in state of the components of Sirius, both presumably of the same age, might thus be explained.

Incidentally, Milne concludes, from the observed frequency of novæ, that every star is a nova at least once in its history. This suggests the question: Has the sun had the disease yet? The appulse of another star, which is the current explanation of the birth of the planetary system, would produce conditions in the sun that would bear some resemblance to an outburst of a nova. Milne ranks the nuclei of planetary nebulæ, also ex-novæ, and possibly the ordinary Wolf-Rayet stars, as collapsed stars that have a high density and a high temperature.

Velocity of Light from the Spiral Nebulæ.—Some months ago Prof. Perrine made the suggestion that the positions of the distant spirals with reference to stars in their vicinity should be observed at different times of the year, as a test whether they indicated the same velocity of light as that from bodies in our own galaxy. It was not anticipated that any difference would be shown, as ever since the Michelson-Morley experiment it has been generally accepted that light from any source gives the same measured velocity. It was, however, of considerable interest to make the experiment. This has been done by Mr. Gustaf Strömberg, using plates obtained with the 60-inch reflector at Mt. Wilson; the results are given in *Pubs. Astr. Soc. Pacific*, August 1931. They give the same aberration constant for the stars and the nebulæ within 0·006″, which is far below the limits of probable error. Hence the velocity of light from the nebulæ is not influenced by the large recessional speed (11,000 km./sec.) which Humason found for the nebulæ that were observed by Strömberg.