OUR ASTRONOMICAL COLUMN.

SCHORR'S COMET.—The following observations are reported from Hamburg. Positions are for equinox of 1918·0:—

	G.M.T. d. h. m.	R.A. h. m. s.	N. Decl. ° ′ ″
Dec.	21 7 48·4	3 56 56·8	13 8 14
	24 8 57·8	3 56 21·2	13 24 19
	26 6 42·8	3 56 8·3	13 34 20
	31 11 10·4	3 56 8·2	14 4 2

The magnitude was 15·0.

Continuation of ephemeris:—

	R.A. h. m. s.	N. Decl. °	Log r	Log Δ
Feb. 4	4 16 50	17 51	0·3370	0·2106
8	4 21 8	18 17		
12	4 25 44	18 42	0·3435	0·2408
16	4 30 36	19 6		
20	4 35 44	19 30	0·3500	0·2699
24	4 41 7	19 53		
28	4 46 43	20 15	0·3566	0·2980

On December 26 the ephemeris needed the corrections +1s., 0·0′

A CURIOUS FEATURE ON JUPITER.—On the night of January 16, at about 9 p.m., Mr. Frank Sargent, of Bristol, observed a luminous protuberance on the eastern edge of Jupiter. It was situated on the equatorial side of the north equatorial belt. He watched it for some time, and it was visible as a white spot well within the limb of Jupiter, but grew fainter as it advanced further on the disc. Clouds interfered and prevented a transit being taken, but on the following night Mr. Sargent re-detected the object, and it was on the central meridian at about 6.46, though so faint as to be scarcely perceptible. He saw it projecting from the western limb at about 9.5 p.m., when it was quite bright and very easily distinguishable. Luminous projections of this kind are often visible on Mars, and are effects of irradiation, but, in the case of Jupiter, where the atmosphere is considerably denser, the conditions are very different, and it seems probable that the feature observed on Jupiter may have been a real prominence, or it would have been obliterated amid the dense vapours on the limb of the planet.

THE PARIS-WASHINGTON LONGITUDE.—Vol. ix. of the Publications of U.S. Naval Observatory contains the details of the determination of this longitude by wireless telegraphy in 1913 and 1914. The transit instruments used were of 3-in. aperture, with travelling wires driven by electric motors. Every transit was observed with the telescope in both positions, thus eliminating collimation and pivot errors. There were two transit instruments at each station—one for a French, the other for an American observer. The observers interchanged stations when half the observations were obtained. The level error was ascertained by striding levels, the azimuth by meridian marks combined with polar stars. High stars, on both sides of the zenith, were used for clock error, thus minimising the effect of an erroneous azimuth.

The wireless signals were sent from Radio (Virginia) and the Eiffel Tower. The power at Radio was 70 kilowatts, and the wave-length 2500 metres. A rhythmic series of signals was sent, controlled by a pendulum, the period of which was 0·99s. M.T. Coincidences of beats between the Radio signals and the ticks of a mean-time chronometer were noted, a similar comparison being made for the signals of the sidereal clocks, the errors of which were obtained from the transit observations.

The double-transmission time over the distance of 3840 miles is 0·0429s. by the American observers, and 0·0424s. by the French. The deduced speed is 180,000 ± 12,000 miles p.s., practically that of light.

The final result for Washington-Paris is 5h. 17m. 36·653s. ± 0·0031s. The result for period ii. is, however, 0·06s. greater than that for period i.

The seconds of the longitude as given by cable exchanges in 1866, 1870, 1872, and 1892 were 36·56s., 36·73s., 36·69s., and 36·70s. respectively. The mean is 36·67s., very near the new determination. The longitudes of several other American observatories were deduced by the same wireless signals. The results are appended to the report.

THE ELECTROLYTIC DISSOCIATION THEORY.

AMONG scientific gatherings the general discussions of the Faraday Society have come to occupy a very high place on account of their representative character and practical value. The latest of these discussions, on the present position of the theory of ionisation, held on January 21, was favoured by an interesting contribution from Prof. Arrhenius himself, the last sentence of which is as follows:—"On the whole, it may be said that the dissociation theory corresponds as well with experience as may be expected in the present state of our knowledge." Nowadays few will quarrel with this dictum.

Although the discussion reflected the general opinion that the dissociation theory of solution is the only one worth serious consideration, it also showed that there are still many unsolved problems in connection with solutions. Among these the following deserve special mention:—(1) The question of hydration or, more generally, "solvation" of the ions; (2) the problem of strong electrolytes—that is, the fact that the ionic equilibrium in strong electrolytes does not follow the law of mass-action, which applies so accurately to weak electrolytes (*e.g.* organic acids); and (3) the question of the chemical activity of ions and non-ionised molecules.

Most chemists now consider that ions in solution are associated with the solvent to a greater or less extent. Some go further, and adopt the view first put forward tentatively by van der Waals in 1891 that association with the solvent is the determining cause of ionisation and that the required energy comes from the heat of hydration of the ions. Although this suggestion is at first sight a plausible one, it is still unsupported by any convincing evidence, and, in any case, is not likely to furnish a full explanation of the mechanism of ionisation.

Further, the many attempts made to determine the degree of hydration of the ions have so far not been very successful. Mr. W. R. Bousfield, who contributed two papers to the discussion, has calculated the degree of hydration of certain ions on the assumption that an ion (with associated water molecules) can be treated as a small sphere moving through the solvent, and that the radius of the complex can be calculated by means of the well-known formula of Stokes. Dr. H. Sand now finds that the application of Stokes's formula in the manner adopted by Mr. Bousfield gives a value for the volume of the hydroxyl ion about one-thirtieth of that obtained by other methods, and he draws the important conclusion that Stokes's formula cannot be applied to particles of molecular magnitude.

The discussion of the problem of strong electrolytes proved of special interest on account of the recent work of Messrs. Washburn and Weiland in America on the dissociation of potassium chloride in very dilute solution (0·00001–0·001 molar). This was rendered