Spectrum of Carbon Disulphide Flames.—An investigation of the flame of carbon disulphide burning under various conditions is described by Prof. A. Fowler and W. M. Vaidya in the July number of the *Proceedings of the Royal Society*. The band spectra associated with sulphur and many of its compounds are fairly well known, although they are not as yet completely analysed, and it was thought that examination of the light should give information about the chemical processes involved. The ordinary 'hot' flame shows principally the bands of the S_2 molecule. Some of these appear normally not in emission but in absorption, although they can be made to appear in emission by slightly altering the conditions of combustion. Emission bands of the substance SO, which is not known as a chemical individual, appear faintly, whilst if the carbon disulphide is burnt in a chimney, absorption bands of the dioxide (SO_2) also appear. Carbon disulphide can give a colder or 'phosphorescent' flame, and it was already known from the work of H. J. Emeléus that this had a different spectrum. In this, Prof. Fowler has now identified bands of SO and CS, the former being relatively much stronger than in the hot flame. Some preliminary measurements have also been made of a new ultra-violet group of bands, not found in flames, which have been provisionally ascribed to carbonyl sulphide (COS). The spectroscopic evidence gives no evidence for or against the presence of peroxides or carbon monoxide in the flames, but is not completely conclusive.

Rhenium Compounds.—The selenides of rhenium have not previously been described, and considerable uncertainty existed as to the sulphides higher than the disulphide. Briscoe, Robinson, and Stoddart, in the June number of the *Journal of the Chemical Society*, describe experiments which show that the heptasulphide, Re_2S_7, is precipitated incompletely by hydrogen sulphide from ammoniacal solutions of potassium per-rhenate. It is a black amorphous powder, formerly described as ReS_2 or ReS_3. The disulphide, ReS_2, is obtained as a black powder by heating rhenium to redness with excess of sulphur in a Rose crucible under hydrogen sulphide, or by heating the heptasulphide to redness in a vacuum. No evidence was obtained of any sulphide between Re_2S_7 and ReS_2 when the heptasulphide was heated to 250° in an atmosphere of nitrogen. The heptaselenide was obtained in the same manner as the heptasulphide by substituting hydrogen selenide for the sulphide. It is a black powder. On heating in a vacuum at 325°-330° for nine hours it loses selenium, leaving the diselenide stable in air and not attacked except by strong oxidising acids.

Cellulose Lacquers.—The solvents and plasticisers used in the modern manufacture of cellulose lacquers are described in the *Chemical Age* for June 27 by T. H. Durrans. The world's consumption of solvents is estimated at 100,000 tons annually, acetone and the acetates of ethyl, butyl, and amyl being most largely used. Most of the largely used solvents are produced by bacterial fermentation, although there have recently been striking advances in synthetical as well as fermentation processes. The range of commonly used resins and plasticisers is also restricted, the main consumption of plasticisers being confined to triacetin, benzyl alcohol, triphenyl and tricresyl phosphates, and the phthalic esters, whilst ester gum and its derivatives are the only resins universally used. The plasticiser is a most important constituent, the nature and quality of the film depending upon it to a very large extent. The plasticiser is, as Dr. Durrans says, "the master of the cellulose ester film and controls its career throughout its life". A property which is receiving much attention is that of toxicity: unsuspected dangers have been disclosed, as, for example, in the case of glycol chlorhydrin. The same issue of the *Chemical Age* contains other interesting articles on solvents, from which it appears that butyl alcohol and acetone are obtained in America by the fermentation of corn starch, the hydrogen and carbon dioxide evolved being converted into synthetic methyl alcohol, the excess of carbon dioxide being turned into solid, used as a refrigerant under the name of "dry ice". Non-inflammable solvents made on the large scale in England include chlorinated acetylenes (trichlorethylene, perchlorethylene, tetrachlorethane), used for oil extraction, dry-cleaning, degreasing wool, and textile scouring. Artificial resins include the coumarone resins, polymerised from coumarone, a constituent of coal tar.

Astronomical Topics.

New Comet, 1931*b*.—*U.A.I. Circ.* No. 327 announces that a new comet was discovered by Mr. Nagata, and confirmed photographically by Mr. Moore at Mt. Wilson; the following rough position is given:

U.T.	R.A.	N. Decl.
July 17^d 16^h 26^m	10^h 41^m	9° 48′

The comet is an evening object, too low in the west for convenient observation. There is no information about motion or brightness. The news was transmitted by Mr. van Maanen and Prof. Shapley.

Rapid Current on Jupiter.—The *Observatory* for July contains a report of Mr. B. Peek's paper to the Royal Astronomical Society in which he examined the outbreak in 1929 of rapidly moving dark spots on the south edge of the North Temperate Belt. He noted that there were similar outbreaks in the same zone in 1880, when the late Mr. W. F. Denning found a rotation period of about 9^h 48^m, and in 1891, when Prof. Barnard found a period of 9^h 49^m. The spots of 1929 had a similar short period, though it grew longer towards the end of the year, when the spots were fainter. The period found is even shorter than the average period for the planet's equator (9^h 50^m 30^s) and very much shorter than the average for the temperate zone (9^h 55^m 40^s). Mr. Peek thinks that there may be a permanent rapid current in this region of the planet, and requests that it should be kept under regular observation.

Star Density in Different Galactic Latitudes.—*Mon. Not. Roy. Ast. Soc.* for May contains a paper by Mr. P. J. Melotte which gives the results of star-counts in forty Kapteyn areas photographed at Greenwich with the 26-inch refractor.

The following abridgment of his table gives the logarithm of the number of stars per square degree in the different zones down to the limiting magnitude stated:

Limiting Magnitude.	Log. of No. of Stars per Square Degree. Gal. Lat. 0° to 20°.	Gal. Lat. 20° to 40°.	Gal. Lat. 40° to 90°.
11·0	1·34	1·03	0·87
12·5	1·94	1·63	1·32
14·0	2·58	2·11	1·80

In the lower latitudes the logarithms are greater than those of Seares and van Rhijn by about 0·12; the difference tends to disappear in the higher zone. It will be seen that down to mag. 14 the galactic zone is six times as rich as the polar zone. The ratio steadily increases as fainter stars are included.