

research institutes, independent or connected with universities or colleges. They indicate a highly satisfactory state of activity and interest in geophysical research in Japan. All the papers are in English.

INSTRUCTIONS and information relative to wireless reports of weather on the coast of Brazil have been issued by the Brazilian Meteorological Service. The Director, Señor Sampaio Ferraz, who is responsible for the issue of the information, is thoroughly conversant with the meteorological requirements. With the view of assisting navigation, twelve transmitting stations have been established on the coast and send observations six times a day, every four hours, of the force and direction of wind and the state of weather and sea. In case of storms and dense fogs, these frequent messages should prove useful to approaching vessels. The reports are expressed in Portuguese, but very simply. The messages from the transmitting stations are sent on 600 m. waves spark. Rio's special messages, sent out twice daily, include detailed forecasts for the south coast of the State of Rio de Janeiro and general forecasts for the rest of the southern Brazilian coast and up to Buenos Aires; the first part, organised by the international code, gives barometric pressure, force and direction of wind, state of weather and air temperature. The instructions contain specifications of the international codes, and every facility is afforded for commanders navi-

gating these seas to draw for themselves weather charts which will give them full information of the conditions of the weather over the whole neighbourhood.

THE British Dyestuffs Corporation, Ltd., Manchester, has issued a booklet entitled "Medicinal Products: A booklet issued to the Medical Profession," which gives an account of the various dyestuffs which have found a therapeutic application, and also of some chemicals that are used as reagents in clinical tests. The formula is given in each case, together with a considerable number of references to papers in which the use of the products is described. The main section is devoted to a consideration of the flavine antiseptics, and is followed by one on the di- and tri-phenyl-methane series: namely, auramine, crystal violet and brilliant and malachite green. Among other dyes considered may be mentioned trypan blue, Biebrich scarlet, gentian violet, methylene blue and picric acid with their therapeutic uses, and indigo-carmin which has been used for testing the function of the kidneys. In the last section a brief account is given, amongst other compounds, of benzidine, dimethylp. aminobenzaldehyde and phenylhydrazine hydrochloride and their use in clinical tests. The booklet should be useful to all those who desire information on the constitution and reactions of any substances in the above groups which they may happen to be using.

### Our Astronomical Column.

THE GREAT FIREBALL OF NOVEMBER 11.—Mr. W. F. Denning writes that the fireball of November 11, 5 h. 40 m. G.M.T., was observed by a great number of persons in Ireland and extreme north of England. Sixty-nine accounts of it have been received, and though the observers were taken by surprise and most of them inexperienced in recording meteors, their results are in very fair agreement. At most of the stations the moon, which was nearly full, was near the beginning point of the meteor and furnished a useful guide to position.

The fireball had an exceptionally lengthy flight, and a very long duration, the average time being 33 seconds, when proper allowance is made. The whole of the luminous course appears to have extended over 510 miles, and the velocity was 16 miles per second. It passed from over the North Sea, 80 miles east of Hartlepool, across the extreme north of England and south of Scotland and onwards over the Atlantic Ocean, to Long.  $11\frac{3}{4}^{\circ}$  west, Lat.  $56\frac{1}{2}^{\circ}$  north. The average height was about 53 miles. The radiant point was as nearly as possible at  $31^{\circ}-6^{\circ}$  near Mira Ceti. As the fireball sailed along in its nearly horizontal course it showed some curious variations of colour; in the head blue and yellow predominated, while flakes of red were distributed along the tail. The effect produced was that of a brilliantly coloured snake-like object wriggling its course through our resisting atmosphere. Some of the observers compared the oval head to the size of a football; others thought it equal to the moon's diameter or to half the latter value. Adopting the smaller estimate, the nucleus would be half a mile in

diameter, but this included the outlying flames and luminous off-combustion resulting from its combustion. The real size of the solid nucleus may not have been more than two or three feet.

OBSERVATIONS OF MARS.—*L'Astronomie* for October contains a number of drawings of the planet, made in September at Juvisy and Meudon. The large dusky areas are represented in much the same manner as by the American draughtsmen, but the canals as a rule are broader and more diffused; some of them appear on almost all the drawings, so that there is practically a consensus as to the existence of the markings, the difference only extending to their exact aspect. Thus, M. Quénesset on September 19 drew the Ganges as a very broad dark streak, fully 300 miles wide, with straight parallel edges.

M. E. M. Antoniadi has again observed the planet with the great Meudon refractor and contributes some very beautiful drawings. As is well known, he rejects the geometrical aspect of the canals and draws them as broad irregular shadings. He reproduces for comparison his drawings of Pandora Fretum made in 1909 and 1911, which show a marked change of intensity of this region from one year to another. He lays stress on the planet being a living world, and is inclined to return to the old notion that those dusky areas that do not show a seasonal change of tint are veritable seas.

M. Quénesset also observed Uranus with the Meudon refractor, and distinctly saw two equatorial belts and dusky regions at the poles. The aspect was quite like that of Jupiter except that the belts were nearly vertical.