Radiovision in the United States.

THE use of the words 'radiogram' and 'radiophone' now seem firmly established to denote a message that has come through the ether, and the instrument by means of which we hear speech and music that has travelled through it, respectively. It seems natural, therefore, to call the seeing of pictures that have travelled through the ether 'radiovision.' According to this analogy, 'television' would be restricted to pictures that have travelled through wires. In this sense we use the words telegraph and telephone.

We learn from Science Service, of Washington, D.C., that there are now 'movies' as well as speech and music in the ether. At certain times of the day, silhouettes are being sent out from the Jenkins Laboratory Station, 3XK at Washington, and later on half-tone pictures will be broadcast. Picture subjects and picture stories, in silhouette, are much easier for the beginner to pick up than real scenes. That they are of interest has been proved by the success of moving picture cartoons at the picture theatres.

In the early days of broadcasting, many amateurs and enthusiasts got much pleasure from building their own sets and searching the ether to try to locate some particular broadcasting station, their pleasure being comparable with that of a fisherman when he first gets into touch with a fish. There is no doubt that the search for visual radio will appeal to many. Receiving radiovision is more difficult than receiving ordinary broadcast, but it is well within the power of an amateur familiar with the ordinary valve sets. Receiving sets are not yet on the market, but C. F. Jenkins, the well-known pioneer in this art, through Science Service, is providing the readers of newspapers with full instructions as to the best way of making one with the help of paper matrices. The apparatus is called a radiovisor. In addition, a small alternating or direct current motor of about $\frac{1}{20}$ horse-power, a special neon tube, and an ordinary radio receiving set are required.

Radiovision is generally restricted to mean the transmission and reception of images of scenes and living persons by means of radio waves. It is probable, however, that considerable use will be made of moving picture films in this connexion. In radiovision, light and shadow are translated into variations of electric intensity, and by means of an aerial produce waves which can be broadcast and received in any home.

The microphone of the ordinary radio transmission picks up sound vibrations and translates them into electrical waves. In a similar way, the eye, which is a photoelectric cell, of the radio transmission station analyses the scene or motion picture into strips of fluctuating light. These strips of fluctuating light, generally 48 in number, are converted into waves and then reconverted into light, which illuminates for a small fraction of a second a screen. Fifteen complete still pictures are flashed on the screen per second. The same principle is adopted as that used in phototelegraphy. A scanning device is used to focus the photoelectric cell on each point of the scene in succession. In radiovision it is necessary to scan the whole scene in the fifteenth of a second.

In order to receive the pictures, four essential parts are necessary, a radio receiving set of good quality, capable of receiving the short wave-lengths used in radiovision, a neon lamp, a scanning disc, and a motor to rotate it. The neon lamp used in America is marked G—10 A.C. 110 volt. The scanning disc is 12 in. in diameter, and 48 holes forming a spiral are punched on it. It can be made of paper, held between two small gramophone records to stiffen it. A rubber friction disc driven by a motor bears on the back of the scanning disc.

Synchronism is obtained by moving the motor board nearer to or farther from the centre of the scanning disc. At first there are only black and white dots and dashes in the picture area, but when synchronism with the broadcasting station is obtained, the picture suddenly appears when the lamp is looked at through the flying holes of the scanning disc. At this speed the motor is running at 900 revolutions per minute. When the picture ends, the picture frame becomes pink; the radiovisor is then switched off and the loudspeaker switched on to listen to the announcer. From 3XK the pictures appear in black silhouette on a pink ground.

International Congress of Mathematics at Bologna.

THE International Congress of Mathematics was held this year at Bologna, on Sept. 3–Sept. 10, under the presidency of Prof. S. Pincherle. In view of the chequered history of these congresses, it is interesting to note the names and countries of the vice-presidents. They include Profs. De La Vallée Poussin (Belgium), Hadamard (France), Hilbert (Germany), W. H. Young and J. C. Fields (Britain and Dominions), Veblen (U.S.A.), Terradas (Spain), Sierpinski (Poland), H. Bohr (Holland, Denmark, Scandinavia). N. Lusin (Russia), and S. Kakeya (Japan).

In a sense this was the first congress of a really international character since the War, and for this reason, if for no other, it was a great pity that England, from the point of view of numbers, was so poorly represented that the matter was freely commented upon.

The first International Congress was held at Zurich in 1896, followed at regular intervals of four years by conferences until they were interrupted by the War. After the War, an attempt was made to renew the periodic sittings, but mathematicians, despite the universality of appeal of their subject, were unable to free themselves from the bondage of war psychology, and representatives from the countries of the Central Powers were at first deliberately excluded. Two conferences have been held with this restriction, one at Strasbourg in 1920 and the other at Toronto in 1924. At the conclusion of the latter, a resolution was carried expressing the view that the period of exclusion should be terminated. Such a resolution was not likely in itself to be successful in drawing once more within the ambit of an international body the powerful group of German mathematicians without whose co-operation such a conference was certain to be ineffective. The transition on this occasion was made the more easy and certain by the fact that the invitations to Bologna were sent out by the *University* of that town without regard to nationality.

The result was that although certain German university representatives were conspicuous by their absence, other schools, Göttingen for example, appeared in such force, both of talent and of numbers, as to exert an almost dominating influence on the gathering. To judge from numbers, appearances suggested that Britain and not Germany had been the excluded country. Out of nearly eight hundred mathematicians,