held at Cairo in the spring of 1938. The Conference commenced on February 1 and was opened by H.M. King Farouk at the Heliopolis Palace Hotel. The work of the Conference entailed much study of the business aspects of telecommunication, including telegraph and telephone tariffs, communication procedure, traffic routing, and many other factors in the art and practice of telecommunication in all its branches. It also included a very important item, the revision of the Madrid General Radio Communications in the light of present-day needs, resulting from progress made during the past five years. This progress had led to increasing congestion in the ether, owing to the tremendous expansion of radio services during this period. Of particular importance was (*a*) the growth of aerial transport, of which radiocommunication in all its forms is a most important ancillary service; (*b*) the ever-insistent demands of broadcasting, which have gathered added strength from the increasing weight of public opinion and political activity; (*c*) the further development of the marine services in all branches, but especially in the short-wave trawler telephony and radiogoniometric services.

The actual modifications made at Cairo, although large, were much smaller than expected. These were mainly due to the modifications made in the allocation of frequencies to the various services, and to the tightening up of the regulations in respect to the frequency tolerances, attributable to the various types of transmitter corresponding to the different services they perform.

The first real allocation of frequencies was made at Washington in 1927 and was largely the result of experience gained during the Great War and subsequent years. It was a tentative effort to distribute the available frequencies among the claimants whose services at that time had begun comparatively recently, namely, radiogoniometry, broadcasting, radiotelephony for small ships, short-wave point-to-point services and amateur activities. The frequency allocations thus adopted were largely influenced by the positions in the radio frequency spectrum required by these new services. At Madrid the frequency allocations were slightly modified to meet growing needs, but the frequencies still remained allocated in comparatively wide bands which were shared among various classes of services. This led to crowding in the case of mobile bands the frequencies of which were shared by marine and aircraft services, notwithstanding the fact that the types of apparatus practicable for these very different vessels vary largely in size and weight and consequently in their technical characteristics. At Cairo further efforts were made to facilitate the solution of the problem of the expansion of the aeronautical services by specifying exclusive bands of frequencies to the various aircraft routes at present in contemplation.

The addition of the *Queen Mary* to the mercantile marine has been a milestone from the radio engineer's point of view. This ship is designed to meet the special requirements of vessels of her class for which it will serve as a model. Developments of the direction-finding services have been continuously taking place, especially in Adcock direction-finders. The study of traffic requirements and the development of engineering and organization methods hand-in-hand have enabled excellent services from an economical point of view between many points on the earth's surface to be found. Printing telegraph methods employed in submarine cable telegraphy are now also employed for radio purposes. The approach of the next sunspot maximum has enabled the P.O. engineers to provide additional plant and aerials so as to meet the anticipated adverse conditions such as frequency 'wobbling'. In ionospheric investigations, important theoretical and experimental discoveries have been made. Mr. Rickard concludes by discussing vacuum tubes and high-frequency cables which can now be constructed so as to be semi-flexible.

TYŌKŌ AND HIS SEISMOSCOPE

A. IMAMURA has recently translated relevant passages concerning the life of Tyōkō and his seismoscope from the Chinese history "Gokanzyo" and discusses this very interesting topic[1].

Tyōkō was born in A.D. 78 in Si-o, Nan-yang Province, China, during the later period of the Post-Han dynasty, and held during his life several important governmental posts including that of the director of the Bureau of Almanac and History during A.D. 115–121, and A.D. 126–133. He was an excellent astronomer and a great literary man, and one of his duties besides constructing almanacs and writing history was to record the great events which happened in the country. About that time, parts of China were seismically active, which may account for his interest in seismology. He is said to have invented, in addition to his seismoscope, an instrument resembling in some respects the modern theodolite, a clock, a tricycle, and a so-called self-flying bird.

In the original Chinese history the seismoscope is not figured but only described. J. Milne in his "Earthquakes and Other Earth Movements" reconstructed a figure and gave a description. Imamura corrects some parts of Milne's figure and description and also comments on interpretations by Mr. Wang Chen-to and Mr. T. Hagiwara, and on a seismoscope constructed by himself.

Tyōkō's seismoscope consisted of a pendulum device which caused a copper ball to fall out of one of eight dragon's heads into the mouth of a waiting toad, according to the direction of the epicentre of the shock. Imamura states that the central pillar was in all probability an inverted pendulum, that no record of the earthquake was made by the instrument, that only one ball dropped at each earthquake, and fell into the mouth of a toad, not a frog. In the original description the dimension of the diameter of the supporting barrel was given as 8 units. Imamura states that the unit mentioned was likely to have been one third of a foot whereas Milne took it to be a foot.

Tyōkō's seismoscope, invented in A.D. 132, probably being the first seismological instrument, will rank equal with his theodolite in scientific achievement, and points him out as having been a man of genius. He died in A.D. 139 at the age of sixty-two years.

[1] *Jap. J. Astro. and Geophys.*, **16**, Nos. 2-3 (1939).