Record

Mr. E. L. HOLMES

It is with regret that we record the death, on 23 February 1958, of Mr. E. L. Holmes, the originator of the transmitting-magnetic compass.

Captain C. J. Wynne Edwards, D.S.C., R.N., Director of the Compass Department, Admiralty Compass Observatory, writes:

The transmission of heading information from a pivoted magnetic needle has engaged the attention of instrument makers for about three-quarters of a century. One of the most practical solutions was that devised by Mr. E. L. Holmes, whereby a self-balancing resistance bridge was constructed round the magnet system of a liquid compass. It had the advantages that a conventional form of compass presentation was available at all times, there was no reaction at the magnet system due to the pick-up method and, since a follow-up system was employed, considerable power was available for transmitting data. The Holmes compass provided the principle and method employed in the transmitting magnetic and gyro-magnetic compasses which are used extensively in the Royal Navy.

Mr. A. J. Hughes, O.B.E., writes:

Holmes was, in fact, more than the father of the transmitting-magnetic compass; he was the first inventor to apply electronic means to transmitting motion, long before there were electronic devices in instruments. In his clear, original mind he conceived a theory of utilizing electric current in liquids as a means of measurement and, after more than fifty years of arduous experimental research, he discovered a new principle which has been successfully applied to industry and has become a world-wide feature of direction by the magnetic compass in navigation.

Edward L. Holmes came from a real Southern family, in the days of the big cotton estates down in Alabama, but after the civil war took place in America the family had to leave, due to the liberation of slaves, and his father trekked, with his family, by wagons to the west coast of America. Young Holmes grew up and was educated at San Francisco and became a civil engineer of distinction; he introduced the reinforcement of cement and was the architect and engineer in the first St. Francis Hotel. He was a man of real culture, tall and distinguished, but he must have experienced serious losses in fortune and, after the big earthquake in San Francisco, he turned his mind to physics.

Some years before the first world war he had acquired enough money to put his principle of transmission from electrodes in a compass bowl into practical shape. Large-size glass bowls 10 inches in diameter in full-size binnacles were built up and connected to Sperry repeaters and his own special device—a magnetic course recorder. He had a little help: some support from Vanderbilt, but Elmer Sperry was then developing his gyro compass and would not look at the Holmes course recorder. His family had shipping connections and through

his own enthusiasm got trials at sea; I think even the U.S. Navy reports were excellent but the elaborate nature of his early model prevented any installations.

When the war was over the magnetic compass still held its own—liquid compasses were coming in but the gyro compass was established.

It must have been about 1927 when I was asked to look at an American invention, a sample of which was in London. I went to a small room and there stood Edward Holmes in his prime, with a full-size model of his compass. After long discussion all I could say was 'leave it here and I will think about it'. Finally I invited Holmes to come to London to develop his transmitting compass. For many years we could not make much progress; it was too costly and the electronics had to be redesigned. The Admiralty Compass Department, under Captain Hitchins, were admirably adapted, with their technical staff, to study the Holmes principle, and gradually they evolved the present type which is described in the handbooks.

The London Planetarium

from Lieut.-Commander R. B. Michell, D.S.C., R.N.

On 19 March the British Commonwealth's first planetarium was opened in London, in the presence of the Duke of Edinburgh. It marks the end of a project first conceived in 1936, when the plan was to install a planetarium in the Science Museum. The present installation, designed by Zeiss, has been set up near Baker Street station, on a site cleared by a 1000-lb. bomb during the blitz. The planetarium, which is run by Madame Tussaud's, seats 550 and the standard display at the moment consists of a forty-minute demonstration illustrating the passage of the year, under the title 'Space Ship Earth'. Background music is provided.

The display brings the Nautical Almanac to life. The basic concepts of hour angle, declination, precession, the ecliptic and so forth, are here presented in 3-D. A visit by any navigation class just becoming acquainted with astronomical terms would ensure a real understanding of the relative movements of heavenly bodies and of the coordinates used in astronomical navigation.

The earliest known designer of a planetarium was Archimedes, in Syracuse in the year B.C. 212. From that date onwards a great variety of astronomical devices were constructed, many of great ingenuity, in an attempt to reproduce the relative motions of the Sun, planets and stars. However, it was not until the seventeenth century, when the true relationship of the heavenly bodies was finally appreciated, that effective models could be made. This understanding synchronized with the great clockmaking era as illustrated by George Graham (1673–1751) whose improved form of planetarium was the basis of an excellent mechanical device that was made for the Earl of Orrery—and thus the name *Orreries* for this type of instrument which may now be seen in museums throughout the world. And so we arrive at today's superlative achievement by Carl Zeiss, creator of the modern planetarium.