ARTICLES IN REVIEW

MARINE SURVEYING IN BRITAIN DURING THE SEVENTEENTH AND EIGHTEENTH CENTURIES

by A. H. W. ROBINSON

« The Geographical Journal », Vol. CXXIII, Part 4, December 1957

This article describes surveying methods developed by the British Navy during the 17th and 18th centuries. Two members of the Royal Society, John Collins and John Caswell, were the first to advocate, in 1674 and 1685 respectively, the use of angles taken at sea between known positions for obtaining a fix. But in the absence of a suitable instrument for measuring angles at sea, notwithstanding various experiments carried out by Hooke, also a member of the Royal Society, the method could not be applied practically and compass measurements had to be relied upon. The method was again recommended without success by Edmond Halley, who attempted to construct an instrument able to measure angles at sea.

In the early years of the 18th century, Henry de Saumarez designed an instrument called the « Marine Surveyor », a sort of towed vaned paddle, which after calibration supplied the distances covered at sea by a vessel. Little use was to be made of this device, however.

In 1731, John Hadley perfected an octant for measuring vertical angles. The instrument was based on the principle of double reflection, but was not used for measuring horizontal angles. Hence the magnetic compass continued to be used in the hydrographic surveys carried out along the coasts of Great Britain from 1737 to 1744 by Lewis Morris and Murdoch Mackenzie.

In 1765, the Reverend John Michell suggested use be made of the Hadley quadrant for horizontal angle measurements, but was unable to solve the resulting resection problem. So he recommended recourse to two observers : one in a boat and the other ashore at one end of the base line. The angle measurements were then to be used to solve the triangle formed by the boat and the base line.

Murdoch Mackenzie (Senior) was finally to succeed in solving the problem completely in 1774 : in his treatise on hydrographic surveying he proposed using Hadley's quadrant for measuring angles and the station pointer (a graduated semicircle equipped with three arms) for obtaining the station. The method was applied from 1775 onwards by his nephew, Murdoch Mackenzie (Junior) and Spence. Thus was the ground prepared for the great task to be carried out by the new British Hydrographic Office during the nineteenth century.

THE TIDAL MODEL AT THE UNIVERSITY OF SOUTHAMPTON

by Prof. P. B. MORICE

« Nature », Vol. 181, No. 4614, London, 5 April 1958

This issue of Nature contains a very interesting description of a tidal model of Southampton Water and the Solent, the object of which is to predict new tidal velocities resulting from modified conditions due to dredging, in order to ascertain whether the bed would remain stable.

Owing to the position of the proposed dredged region and the features of the tidal streams, two pneumatic tidal generators were required : at Hurst in the west and Gilkicker in the east. Water is drawn into or released from tanks by changes in the tank air-pressure which is controlled by valves and moved by high-speed pumps.

The main features of the tidal current system in this region are a large flow back and forth in the Solent and a relatively small flow in and out of Southampton Water; there is no resultant circulation around the Isle of Wight. For the present the tidal generators operate on a maximum spring tide cycle only, which gives the maximum current velocities. It is intended to produce the whole range from neap to spring tides by an electronic control system.

The scales of the model are the following :

— horizontal scale 1/1 250;
— vertical scale 1/100;
— velocity scale 1/10;
— time scale 125/1.

This latter gives a tidal cycle period of 6 min in the model.

The model has been constructed with a hard bed which is shaped by hardboard templates spaced at approximately 1-ft intervals and made as profiles indicated on the chart. The model is completed by a recording equipment including level recorders and a movable integrating current-meter.

The author states in his conclusion that the model has already convinced the Southampton Harbour Board that the proposed dredgings are likely to be stable. A number of projects concerning changes to the regime have been proposed, for which the model will be used to forecast full-scale effects.

FUNKPEILUNGEN DES ERSTEN KÜNSTLICHEN ERDSATELLITEN SPUTNIK

(Radio bearings taken from the first artificial earth satellite (Sputnik)

by Maximilian WACHTLER

« Deutsche Hydrographische Zeitschrift », Hamburg, Vol. 10, Part. 5, 1957

When it became known that the first Sputnik satellite was equipped with a radio transmitter with frequencies in the ultra-short and short-wave band, it became of great interest to complete the usual radio observations by radio bearings. It was of special interest to take these bearings by means of a visual direction finder on the twin-channel principle, since this device not only indicates

direction of the bearing but gives accurate information about its quality from the presentation on the cathode-ray tube.

Such bearings from the first satellite were taken by means of the short-wave Plath Visual Direction Finder SFP 430 K on 16 and 17 October 1957, on a frequency of 20.005 Mc/s. A special feature is that nearly all resulting indications are pure line indications. The different series of observations show a variation of the bearings both in a clockwise and counterclockwise direction, covering angles between approximately 4° and 171°. These bearings for a short-wave transmitter beyond the ionosphere were compared with bearings for two very distant stations on nearly identical frequencies. The bearings show the elliptical split characteristic of coherent waves.
