SEARCH FOR SHOALS

(Lecture delivered by Ingénieur Hydrographe en Chef PELISSIER (France) before the IVth International Hydrographic Conference, 21st April, 1937).

The Hydrographic Expedition to Indochina is about to complete the third year of its field work in the Gulf of Siam and on the coasts of Cambodia.

It has been searching for a certain number of shoals whose position and existence even are doubtful. In the zone it is intended to explore there are 9 at distances from the coast varying from 20 to 120 miles; 9 others lie to the north and west of this zone and are closer to Siam than to Cambodia.

In the search for these banks the expedition has made use of a method proposed some time ago and which was described in 1902 by M. J. RENAUD, *Ingénieur hydrographe en chef,* who was one of the promoters of the organization of the International Hydrographic Bureau (1). This method was effectively employed in 1936 and 1937. It consists in exploring by observation, without taking photographs, from an airplane flying at altitudes of 300 to 400 metres (600 to 800 feet) over the suspected zones. M. RENAUD proposed using balloons.

The results obtained might be of interest to the Delegates. In 1936 at the first attempt it was possible to prepare a sketch of the Kusrovie plateau, to discover new banks to the north and south of this shoal and to determine the position of the Condor Reef, as a result of which it has had to be displaced two miles to the westward. In 1937 none of the 5 shoals sought have been discovered but at the same time certain definite information was obtained. These five reefs do not exist in the zone which was explored, that is, in the 15 square miles having its center at the presumed position of the reef. In fact the known reefs were recognized at distances of four miles from the course under the same conditions of weather and visibility where the operations were being conducted.

The conclusions of the naval officer in charge of the field work, the Hydrographic Engineer who was technical director of the work and the Commander of the vessels of the Expedition were identical. Aircraft are extremely valuable aids in the search for banks or reefs not well known or well located, but they should only be employed when weather conditions are favorable.

II.

I should like to add a few words to the statements made yesterday by Ingénieur hydrographe général COT in regard to the gravimetric expedi-

(1) Note on the subject of the search for submerged rocks by M. Renaud, *Annales hydrographiques,* 1902. In this same note M. RENAUD set forth his ideas regarding the wire-drag.

tion of M. MARTI. My aim is to apprise you of a very interesting sounding which was obtained on the course of the second voyage.

First however, I should like to say a few words about the banks recently discovered in the western basin of the Mediterranean by the *Service français des Câbles sous-marins* (French Cable Company). Several years ago the cable vessels *Ampère* and *Emile Baudot* belonging to this company, found three banks in the channel of Majorca. The largest of these was a bank of 118 metres surrounded by depths of over 700 metres and located at least 5 miles from the bathymetric line of 1000 metres. It has been named the " Emile Baudot Bank ". The *Emile Baudot* also discovered a remarkable bank 11 miles to the south-west with a depth of 67 metres, which had been shown on several Spanish charts and was located 28 miles to the eastward of Alhoran and 45 miles north of Zafarines. The sounding of 67 metres was followed by the legend " placer " which means auriferous sand and even pearl fisheries, but which also means " sand-bank ". This bank had been omitted from most of the French and English charts. The discovery of the *Emile Baudot* proved that this omission was not very prudent. The bank was again explored in 1935 by the *Ampère* which made a rather complete, if not detailed study of it. The minimum sounding of 235 metres located three miles from the bathymetric line of 1000 metres is surrounded to the westward as to the southward, save in one point, by depths of more than 600 metres. It is possible that there may be depths of less that 235 metres on this bank, but it is not very probable, in view of the density of the soundings of the *Ampère,* that a systematic survey will lower the peak to 67 metres and that the bank will turn out to be the " placer " of the Spanish charts.

On his second expedition M. MARTI obtained a certain number of acoustic soundings which were unfortunately rather isolated. Thirteen miles to the southward of " placer " and eight miles S.W. of the 235 metre bank he obtained a sounding of 120 metres. Thus the " placer " might exist at a position very slightly different from that shown on the Spanish charts and may have a depth either identical or very close to that shown.