

# THE RELATIONSHIP BETWEEN HYDROGRAPHIC AND OCEANOGRAPHIC SURVEYING

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The papers by Commodore LANGERAAR, Ingénieur Hydrographe Général GOUGENHEIM and M. ALBINI listed below have certainly drawn attention to a problem facing those responsible for planning the national hydrographic efforts at the present time — the growing importance of oceanography in relation to traditional hydrography.

I believe the problem would be simplified if we differentiated between oceanographic research and oceanographic surveying. GOUGENHEIM refers to the latter as 'descriptive oceanography', and Captain G.P.D. HALL of the Royal Naval Surveying Service has frequently advocated that oceanographic research would be better termed 'oceanology'. Both these re-namings could be adopted with general benefit so that we could speak of 'oceanology' when referring to oceanographic research and 'descriptive oceanography' when referring to oceanographic surveying.

I question the somewhat narrow approach by ALBINI which implies that hydrography provides only for the safety of surface navigation. Since the Lucas wire sounding machine was invented about 1880 by the Telegraph Construction and Maintenance Company, and continuing through the introduction of echo sounding machines capable of sounding to extreme depths in the years immediately subsequent to World War II, surveying ships of many nations have regularly obtained deep soundings far beyond the continental shelf, such soundings have formed the main contribution to the General Bathymetric Chart of the Oceans, established by Prince Albert I, and handed over to the custody of the International Hydrographic Bureau.

The General Bathymetric Chart of the Oceans is not in any way a navigational chart (although I have advocated elsewhere that it might be made so), and undoubtedly over the years the series has been recognised as a world base map for the use of oceanic science. The hydrographic surveyor has thus been serving the cause of international science, a hardly less important task than that performed for the world's navigators.

Nor can the needs of the submarine navigator be dismissed as lightly as has been done by ALBINI, for many national hydrographic offices have a direct responsibility for supplying the charting requirements of their respective navies which increasingly use submarines. In August 1958 when Commander ANDERSON USN in the nuclear submarine *Nautilus* passed from the North Pacific to the North Atlantic under the Polar ice he shortened

the sea route from Japan to Europe by nearly 5 000 miles and pointed the way for a merchant submarine of the future. To-day's charts may one day be carried in such merchant vessels.

I regard a national hydrographic office as being responsible for providing not only charts to satisfy the needs of surface navigation, but also base charts of the oceans and seas within their normal spheres of interest for use by fishermen, scientists and all those in search of sea-bed resources. This is in line with the tasks of a national land survey office, which is required to prepare special maps for land use, town planning and requirements other than those of the traveller. Thus, I should expect the modern hydrographic surveyor to make a number of additional measurements and records which will reveal the nature of the ocean floor and the waters above.

Moreover, the expense of sending a surveying ship to sea to-day is such that the hydrographic surveyor who is lucky enough to be provided with suitable craft would be failing his country if he did not arrange to take additional observations under way of an oceanographic nature; these will throw much extra light on the nature of the floor of the ocean beyond the simple fact of its depth beneath the surface. I refer to seaborne gravity and magnetic observations which could always be associated with ocean sounding, and I would include an airgun or similar type of sub-bottom profiler when this form of equipment is developed beyond the experimental stage, for it too gives a far more detailed picture of the ocean floor than can be seen on the precision depth recorder.

There are also occasions when the hydrographic surveyor may be called upon to carry out surveys of the water structure (temperature and salinity at depth) in a given oceanic or sea area, at different seasons of the year, to satisfy the needs of defence (submarine location) or fisheries.

I believe that ALBINI has fallen into a grave error in paragraph 3 of his conclusions. Many hydrographic surveyors have learnt in recent years that any attempt to collect data 'provided such operations do not hinder or delay their surveys' is doomed to failure; haste in such matters as oceanographic recording leads to shoddy work and damage to the good name of surveyors. 'Sufficient oceanographic training' means nothing less than very careful instruction of personnel engaged on full-time oceanographic surveys which must take equal precedence with bathymetric work.

I have tried above to establish the need for hydrographic surveyors to survey the nature of the ocean floor and the sea water above it as well as measuring the depth. The subsequent 'research' in oceanographic questions is, I consider, purely the field of the scientific expert in the same way as the topographic surveyor and the geologist work in the related fields on land.

It is at this point convenient to consider the proposal to set up an oceanographic section within the International Hydrographic Bureau and it is here that I find myself in sympathy with ALBINI and possibly in conflict with LANGERAAR and GOUGENHEIM. In paragraph 3 of ALBINI's conclusions the phrase 'Moreover, it would be advisable to carry oceanographic experts aboard hydrographic vessels in an advisory capacity' implies

an abundance of such persons, whereas I believe it is universally recognised that there is a very considerable shortage, and insufficient to meet the needs of oceanology (oceanographic research).

I believe it would be difficult to attract oceanographers of a high calibre to join the International Hydrographic Bureau where they would find themselves in an advisory capacity. There would be an increasing temptation for them to enter the field of oceanographic research, thus setting up another centre of international oceanography which would contribute little unless it grew to proportions that would dwarf the hydrographic side of the work for which the Bureau was established.

In conclusion, I would repeat that the oceanographic surveying (descriptive oceanography) is indeed the task of the Hydrographic surveyor, as is the duty of keeping himself in touch with new and developing instruments in this field. Scientific advice for the form that such surveys should take should be sought from national bodies employed on oceanographic research, and scientists would normally be carried in survey ships only when new instruments for ocean survey are being developed, or when the vessel is 'lent' to national or university bodies for particular research observations of the type that will lead to an improved knowledge of the ocean floor or the sea-water. On such occasions the surveyor will expedite the work by his capability in handling both his ship and scientific instruments at sea.

To meet these requirements I believe that the training of hydrographic surveyors in current oceanographic observing techniques (with the exception of those in the marine biological field) requires much consideration and time; and it should be impressed on the hydrographic surveyor that he must bring to oceanographic observing all the skill, dedication and attention to detail that he has traditionally been accustomed to apply to his trade.

### BIBLIOGRAPHY

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