

the most critical population comparisons are difficult to contrive because the availability of the perishable samples is often unpredictable. Until the preservation of material is successfully achieved and the repeatability of testing methods learned by practical experience, fresh control material is essential in all tests. The interpretation of test results in less than ideal conditions makes undue demands on experience and personal judgment. In this instance, the serological observations were used effectively and a wide range of techniques were explored to further the taxonomy and natural history of the salmonids present in Italy. However, because the material used in this study is more amenable to controlled breeding experiments than is the case with most marine fish, in that hatchery techniques for freshwater fish are already at an advanced stage, the reviewer hopes that this work on salmonid serology will be followed up by an investigation into the currently more relevant problem of genetic variation within progeny groups.

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A. W. LANG. *Seekarten der südlichen Nord- und Ostsee. Ihre Entwicklung von den Anfängen bis zum Ende des 18. Jahrhunderts.* (Ergänzungsheft zur Deutschen Hydrographischen Zeitschrift, Reihe B (4°), (10) 1968. Deutsches Hydrographisches Institut, Hamburg, in conjunction with Gebrüder Borntraeger, Berlin and Stuttgart. 105 pp + 20 plates. D.M. 56.

This scholarly volume on the charts of the southern parts of the North Sea and Baltic is published to celebrate the centenary of the founding of the Norddeutsche Seewarte, one of the forerunners of the present Deutsches Hydrographisches Institut. The work was initiated by the past president of the Institut, Dr G. BÖHNECKE, and the volume has a preface by the current president, Professor H. U. ROLL.

Before modern charts became available, the so-called "Schetskaarten" (chart-like sketches) were used, although these were of secondary importance for the purposes of navigation. In contrast to modern practice in which sailing directions are primarily derived from charts, the primary sailing directions were then derived from route descriptions. This period of the "Schetskaarten" – the period up to 1800 – is the main subject of the book, but in addition a short description is given regarding the development of charts of the region up to 1900.

The first charts covering these waters are to be found in the sailing directions known as the "portolani"; these referred mainly to the Mediterranean and to the Atlantic coast as far north as the English Channel, but from the 14th century they also included the northern European seas to some degree. In the following century the North Sea and Baltic are relatively well represented in these portolani; evidently, information from the so-called "Leeskaart" books were used in their preparation.

These "Leeskaart" books were collections of sailing directions in book form, and originally contained no charts, in spite of their name. They are to be dis-

tinguished from the chart-like sketches ("Paskaarten" or "Schetskaarten") which first became available in the form of printed sheets in 1526, with the publication of JAN VAN HOIRNE's "Caerte van der Oosterscherzee". Of these, the most famous is the "Caerte van Oostland" by ANTHONISZ., first published in 1543. For a century or so, hydrography in northern Europe was dominated by the Dutch. Apart from those mentioned above, other famous names in this period are WAGHENAER and HAEYEN and in the same period the world chart of MERCATOR was issued (in 1568). Evidently, however, the time was not yet ripe for the use of his projection in the marine cartography of this region.

During the 17th century, the monopoly of Dutch hydrographers in these waters was broken, first in the Baltic and later in the North Sea also. In the Baltic, Sweden was the first to take over from the Dutch, and an important contribution was the first Swedish Maritime Atlas, published in 1695 by ROSENFELDT and GEDDA, which included two modern charts on the Mercator projection.

Denmark and Russia also made an effort in charting the Baltic during this period. As regards Denmark, emphasis is placed on the surveys started in 1689 by the chart director JENS SØRENSEN, a tragic figure in Danish hydrography. His sheets, which were astonishingly reliable in some respects, were never published.

The book under review contains a wealth of information, which is enhanced by a section containing 351 notes. There is also a section enumerating in alphabetical order the sources and literature used. The content of the book is summarized in German, English, French and Russian.

Last but not least mention should be made of the 20 plates, some covering two pages, which reproduce charts or parts of charts described in the text.

The book will be of very great interest not only to hydrographers and cartographers, but also to all enthusiasts of old maps and charts, and the very fine presentation will contribute to the pleasure of having it on the shelf. In short, the book gives great credit to the author and to the Deutsches Hydrographisches Institut who published it and in whose printing-works the plates were reproduced.

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