

The book comes out in an edition of 80,000 copies. We may hope that it helps to bring in the greatly enlarged labour force which will be needed, for this is the right way to go about it.

Terence Armstrong

VIKING AMERICA: THE NORSE CROSSINGS AND THEIR LEGACY. BY JAMES ROBERT ENTERLINE. *Garden City, New York: Doubleday and Company, Inc., 1972. 5¾ x 8½ inches, 217 pages, illustrated. \$6.95*

Much of the material in "Viking America" is made up of generally well-known surveys of the Norse sagas, as well as their interpretation, mainly where they relate to Vinland. But in addition to these old clichés, Enterline proposes an absolutely unorthodox theory on the Viking migrations to Arctic Canada and Alaska. The evidence is based on "old maps" and is set forth in chapter 5: "Traces on the maps of history". Enterline's great idea is that "old maps" have not been adequately utilized as source material on America's history of explorations, especially as to the circumstances of the Norse discoveries in America. The reason for this, according to Enterline, is that researchers have not been able to interpret them fully: "Many of these maps have lain under the noses of historians for centuries, but have escaped notice because their information is in seemingly incomprehensible, distorted form." (p. 74). In Enterline's opinion, the "incomprehensible distorted form" on a large number of pre-Columbian maps of the Old World often represents North American territories.

It is well known that American localities appear as territories in the eastern part of Eurasia on maps drawn after Columbus' discovery of America. This is the case for example in Johannes Ruysch's map of the world in Ptolemaios' edition, Rome 1508; here Newfoundland (Terra Nova) is sketched in on a place in east Asia that amounts to Kamchatka, south of Greenland (Grvenlant), that is itself placed on Chukter peninsula's place. This placing is, however, a natural consequence of the general conception of that era, that the newly discovered lands in the western region of the Atlantic Ocean were part of the Old World's mainland. East American localities sketched in as lying in Eurasia on maps drawn after Columbus' discovery of America are thus general knowledge in cartographic historic circles. On the other hand, it is not a general view that American territories should be placed in

Eurasia on pre-Columbus maps. And still more untraditional is Enterline's theory that pre-Columbus maps should "include detailed maps of Greenland's immediate western neighbour, Baffin Island, the Arctic Archipelago north of Canada and the Canadian arctic coast." (p. 74). After that allegation Enterline writes, "While publication economics dictate that the many dozens of documentations of this claim be left for a separate study, the illustration of the concept on page 89 may meanwhile somewhat relieve the strain of accepting it on faith" (p. 75). I must say that I longingly look forward to the day when Enterline publishes "the many dozens of documents"; until then I and other interested readers must be content with "the concept on page 89". On that page we see: "Portion of 1427 map (Plate 15)" of Scandinavia "by Claudius Clavus (top), compared with Alaska's Seward Peninsula (bottom)" [cited from the caption]. A comparison should illustrate the similarity between Claudius Clavus' Scandinavia and the Alaskan configuration. In any case there is a similarity; a similarity that makes Enterline advance the theory that Clavus' Scandinavia is in reality a delineation of Alaska. Thus he writes frankly on Clavus' map (p. 89): "Plate 15, drawn at Rome in 1427 by one Claudius Clavus, depicted the Bering Strait area of Alaska with Seward Peninsula in precise detail as shown by the above comparison figure." Clavus' map must therefore belong to Enterline's group of "old maps with incomprehensible form". Enterline divides these "old maps" into two main groups on the basis of what he calls Grand Misunderstanding and Smaller Misunderstanding.

Grand Misunderstanding: On this kind of map, says Enterline, the south European scholars place details of American localities in Eurasia, and they are placed in their position in relation to the four corners of the world. Thus Alaska becomes identical with Scandinavia. The reason for this distortion should be related to the scant knowledge the south European scholars of the Middle Ages had of Scandinavia. That in south Europe there was a lack of geographic knowledge about Scandinavia is evidenced from the cartographic production there. On this there can be no doubt and here I am in agreement with Enterline. But if he means that Scandinavia from Clavus' map is in reality a cartographic reproduction of Alaska and will, so saying, label Clavus' map as part of the group of Grand Misunderstandings, then our agreement stops. It must namely be excluded from that group alone because Clavus, who was Scandinavian, had an ex-

cellent knowledge of Scandinavia and North Atlantic affairs, which among other things is revealed in many of his latitude provisions.

Smaller Misunderstanding: Maps belonging to this group also have American localities placed in Scandinavian regions. According to Enterline, they should be placed this way because the cartographic information about America that accrued to the south European map makers, reached them via connections from the Scandinavian peninsula. Because of lack of reports on where the information came from and what it depicted, the map makers believed that it might concern cartographic reports appertaining to Scandinavia. Since the Dane Clavus, who is also mentioned above, possessed an excellent knowledge of Scandinavia, his maps naturally cannot be grouped in this box either.

According to the above, the Dane Claudius Clavus' map does not fit into either of Enterline's two groups. Clavus' map is, in my opinion, the worst possible map example that Enterline could point out as proof for his theory about the Norse immigration to Arctic Canada and Alaska. However, even though Enterline's theory seems somewhat far-fetched to me, and even though the map examples by no means prove his theory, I nevertheless was delighted to read his account. It is rather refreshing to see problems illuminated in an untraditional manner.

Ib Rønne Kejibo

MARINE SEDIMENTS OF THE SOUTHERN OCEANS. BY H. G. GOODELL *et al.* *Antarctic Map Folio Series No. 17.* New York: American Geographical Society, 1973. 11 x 17 inches, 18 pages, illustrations. \$11.00 U.S.

The publication last year of this long-awaited folio on the *Marine Sediments of the Southern Oceans* is a welcome addition to the fast growing knowledge of the seas surrounding Antarctica. It seems logical and appropriate that the publication of this folio followed those on hydrography, chemistry, topography and biology of the Southern Ocean. These folios have set the stage for the material included in the present folio; one wishes to commend the publishers of the Series for such good planning. For, as we learn from this folio, in order to study the oceanic sedimentary deposits around Antarctica, it is essential to know the topography and structure of the sea floor, as well as the circulation of the water masses above and the planktonic orga-

nisms living in the water column. In recent years, it has become increasingly difficult to isolate marine geology from the province of marine geophysics, or from the domain of the water above. The present folio is a good example of the close interrelatedness of the physical/chemical/biological disciplines and their bearing on some of the unique phenomena of the Southern Ocean.

The folio is divided into four sections: *The Sediments*, by H. G. Goodell; *Sediments Isopachs in the Indian and Pacific Sectors (105° E. to 70° W.)*, by R. Houtz *et al.*; *Distribution of Foraminifera in the Surface Sediments*, by R. J. Echols and J. P. Kennett; and *Distribution of Planktonic Diatoms in Surface Sediments of the Southern South Pacific*, by J. G. Donahue. Each section is separate with its own introduction, historical background, discussion, references and data sources.

Although marine sedimentological investigations of the oceans surrounding Antarctica date back to the H. M. S. *Challenger* Expedition (1873-1876), it was not until the arrival of the U.S.N.S. *Eltanin* on the scene a little more than a decade ago that research in marine geology and sediments of the antarctic and subantarctic regions gained considerable momentum and intensity.

Based on the extensive material taken by the *Eltanin*, which is by far the most comprehensive bottom samples ever collected by a ship in the Southern Ocean, Goodell provides a detailed map of the bottom sediments of the circumantarctic. The sediments distribution, arranged concentrically, is as follows: (a) shelf and coastal deposits; (b) clayey silts and silty clay; (c) silicious ooze, mostly diatoms with radiolarians; (d) calcareous silicious ooze with both types of test exceeding 30%; and (e) calcareous ooze, mostly foraminiferal. The map shows the significant effect of the Antarctic Convergence in delineating the silicious ooze to the south from calcareous ooze to the north, with a zone of intermixing up to 600 kilometres wide south of Australia. Also, with regard to the convergence, it is stated that "the highest rates of productivity are along the Antarctic Convergence". This view is shared by other marine geologists, but it lacks accuracy. The extensive productivity data collected by this reviewer, and by many others during the past decade, have shown that, by and large, the most productive waters are near the Antarctic continent, and the least productive along the Antarctic Convergence. However, it is possible that the instability of the water column at the convergence, together with other factors militating against growth of phytoplank-