

4. Methods for Ordering and Dating Old Geographic Maps and Descriptions

4.1. The map-code and the map-improvement principle

Each geographic map described in a historical text graphically or verbally reflects the state of geography in the epoch when it was made. With the development of science, cartography developed, too, and erroneous information, generally speaking, decreased, while the amount of correct information increased. It would be interesting to work out a formal method of statistical character, permitting us to date one or another geographic description and map, and, in particular, find a chronologically correct relative ordering in time of the collection of surviving maps on the basis of the analysis of configurational and terminological particulars. In the present section, we offer such a technique, list the results of the associated experiment permitting us to check the algorithm, and apply it for the purpose of dating. Since considerable geographic data have been accumulated until now, its systematic study requires some global approach which can be based on the statistical "map-improvement principle" formulated below, verified and confirmed by dated sources. Such an approach permits us to process considerable cartographic information, and discover statistical regularities characterizing the evolution of geographic ideas. It should be noted that a considerable number of works have appeared recently that are devoted to the analysis of cartographic features of old maps [249], [270], [271], [272].

Since we had to study a considerable number of geographic data, quite heterogeneous and fixed in ancient maps, we had to create a table, called by the author the *map-code* (MC), that accumulates all the basic features of concrete map. The list of the basic features was made up according to their importance, "invariance", and frequency of use by cartographers. This optimal map-code compiled on the basis of the concrete ancient map study permits us to represent each map given graphically or verbally as a table containing all basic map features in the order of decreasing "invariance". The MC was constructed in accordance with the same principle as the *enquête-code* (EC), introduced and studied by the author in Part 1. We only give here its basic divisions: Whether it is (1) a terrestrial globe; (2) a plane map; (3) the map of the world; (4) a regional map; whether it depicts (5) the structure of the "map boundary" (water, land, etc.) in the case of the map of the world, position of the poles, equator, tropics, climatic zones and time zones; (6) map orientation, i.e., the use of the names "North", "South", etc., terms "above" or "below", Cybele (see [270], pp. 32-33), cartographic or chorographic orientation; whether it supplies (7) a complete list of all geographic names translated: continents, oceans, seas, lakes, rivers, states and individual regions, peoples and tribes, so-called "blank spaces"; (8) principal topological (geometric) characteristics of water reservoirs: bays and seas joined by them, representation of seas as large water reservoirs or narrow "rivers", the latter method being characteristic of many old maps, which can be explained by coastal navigation); (9) topological characteristics of the Mediterranean as the sea represented most often and accurately.

Thus, filling in all the items, we can represent each map as a set of characteristics, each of which can be considered as a "formal name" describing the properties of the