SCHOOL „GEOGRAPHICAL ATLAS OF POLAND”
FOR THE BLIND AND VISUALLY HANDICAPPED

Magdalena Polak, Izabella Krauze-Tomczyk
Head Office of Geodesy and Cartography
2, Wspólna Street, 00-926 Warsaw, Poland

ABSTRACT

The atlas is the first publication of this type in Poland and one of the larger with regard to the range of its subject matter, it is also one of the more innovatory typological atlases. The prominent feature of the atlas is such a representation of its content that the maps are readable by the blind, visually handicapped and those who are not handicapped. The application in the process of printing special explosive paper that permits to present the content both in a convex, protuberant form as well as on colorful surfaces.

In the atlas are 25 map tables grouped in thematic blocks. The atlas also contains methodological guidelines for parents and teachers of the blind which use the atlas.

The Braille annex “Geographical Atlas of Poland – explanations” destined for the blind readers, which contains the explanations of the proposed solutions, is an integral part of the atlas.

1. ESSENTIAL FOUNDATIONS OF THE ATLAS

“Geographical Atlas of Poland” is the school atlas. Its content was adjusted to the program of teaching in the grammar school, approved by the Ministry of National Education and Sport. However, part of the maps can be successfully used in the course of work with younger pupils, and tables with more versatile subjects will give information also for the adults.

Atlas contains 25 map tables.

Table “Basic Map” opens cartographical part of the atlas and includes simplified map of Poland at a scale of 1:3000 000, containing only borders of the country, main rivers, the biggest cities and fragment of Baltic Sea. The aim of this map is to make pupil acquainted with the most important elements of Poland’s geography. At the same time, on the next tables these elements serve for orientation, being the framework for reading map and for localizing the other elements: “Basic Map” was also equipped with cartographic grid, consisting of utmost and middle meridians and parallels for our country as well as geographic directions.

The remaining maps were divided into three thematic groups: natural environment, society and economy and Poland in Europe. Part called Natural Environment includes physical maps: division of Poland into geographical regions, geological, climate, hydographic maps and table presenting protection of environment and its degradation.

Part called Society and Economy includes the following subjects: administrative division, population, agriculture, industry and services.

Maps contained in the first two parts of the atlas were prepared at three scales: 1:2500 000, 1:4000 000 and 1:6000 000. 1:2500 000 map includes all objects presented on “Basic Map”, while maps at two remaining scales comprise the selected elements. While preparing maps a rule was applied, that maps at the same scale include the same set of elements, selected from “Basic Map”. For example: on all maps at a scale of 1:2500 000 the following rivers were shown: Wisla, Odra, Warta, Bug, Narew, San and Nysa Luzycka. Each 1:400 000 maps comprises Wisla and Odra, while on 1: 600 000 map only Wisla is presented.

In order to facilitate orientation on each map map content of Poland Baltic Sea was included in schematic form.

On all maps of Poland content of the map is presented only within boundaries of Poland. Such a solution helps blind and visually handicapped people to identify area of the country and does not disturb perception by additional elements located outside Poland.

Third part of the atlas presents Poland in the broader geographical, historical and political context. It includes maps showing neighbours of Poland, Baltic Sea, European Union as well as boundaries of Poland before and after Second World War. Both scale and extent of these maps are adjusted to the presented subject.

Owing to application of the previously described technology “Geographical Atlas of Poland” is designed both for totally blind pupils and for those visually handicapped. Each mark included in the atlas is composed from black convex elements, which are possible for reading both by sight and touch and emphasized with distinct bright colour, facilitating its recognition by visually handicapped people. Each map comprises descriptions both in Braille system and in printed form for visually handicapped. Way of description of map elements is presented in chapter 3.
The atlas has the following size: 410 mm horizontally and 297 mm vertically (A3 format) and is bound along the longer side, i.e. on the top of atlas. Horizontal layout of tables enables to design optimally atlas tables. Binding of particular tables with spring was selected, considering use of atlas at school during lessons. Such a bound allows for placing tables, which were already studied, up or down. Owing to this solution reader does not disturb his neighbour and atlas takes less place in the school bench.

2. THE SELECTED CARTOGRAPHIC PROBLEMS

Preparation of tyflogographical maps has in Poland over 20-year’s tradition. The gained experience was related to maps produced by thermal-vacuum method. However, general rules were partly applied while preparing maps in new technology.

Tytlocartography is new domain comparing to traditional cartography. In traditional cartography methods of map edition: generalization and cartographic methodology were established and described. Tytocartographer in most cases must rely on knowledge of tyloeducators, blind and visually handicapped people, as well as on his intuition. Such a basic notion in traditional cartography as Bertin graphic variables must be totally modified in case of tytocartography. Lack of theoretical rules can be especially visible in case of thematic cartography, in particular while discussing application of quantitative methods.

Tytlocartographer is also faced with the other problem – he must abandon traditional map perception and try to see it as it can be “seen” by blind or visually handicapped person. Additionally, each person with the damaged eyesight "reads" map in his own manner, depending on degree of damage and on the way, he was taught to read graphics and drawings. All above described difficulties caused, that solutions applied in the Geographical Atlas of Poland are often different from those traditionally accepted. They were briefly presented in the next part of chapter.

2.1. Cartographic generalization

Map designed for blind and visually handicapped people comprises much less information comparing to traditional map at the same scale and subject. Generalization in traditional cartography is the complex process, which often cannot be formalized. So, nobody can be surprised, that tytocartographer must solve difficult task trying to make generalization. In case of quantitative generalization selection of the most important elements from a group of objects or phenomena, which are traditionally considered to be absolutely indispensable for a given subject, was a problem while preparing maps of “Geographical Atlas of Poland”. Qualitative generalization was even much more complicated task, as it resulted in presentation of some map elements in the way, which so far was not applied in traditional cartography.

Lakes can be an example of this new way of presentation in “Geographical Atlas of Poland”. On traditional maps water reservoirs are shown using areal signature, drawing their range. In case of atlas maps such a solution was not possible, as size of majority of Polish lakes at map scale is too small, to recognize its location by touch. So it was decided to present lakes by point signature: horizontal semi-circle (e.g. table “Waters”). However, such a solution was misleading for some bigger European lakes (e.g. Ladoga and Wener). That’s why it was decided to include for these lakes both signature and their range (table “Baltic Sea”).

The other non-conventional cartographic solution is exemplified by entering one signature for a river, which is also boundary of the country. Two, parallel signatures for a river and boundary, which can be readable by touch, occupy a lot of space on the map, as a distance between them must be at least 5 mm. One line enables to save some space.

Map of European Union was the most difficult to generalize. In order to ensure the best its readability the following smallest states of Western Europe, which do not belong To European Union, were omitted: Andorra, Monaco, Lichtenstein, San Marino and Vatican. Boundaries of the remaining states, which do not belong to European Union were not drawn, but they were presented as one area marked with texture. European Union states characterized by larger area, which can be visible at map scale, were marked traditionally with boundary signature, while smaller EU states: Luxembourg, Malta and Cyprus were marked with point signature.

2.2. Cartographic methods

All signatures, recognized by touch, must be much larger than signatures for reading. For instance, circular signature applied on traditional maps as town designation, has usually diameter less than 1 mm. In case of technology used for production of “Geographical Atlas of Poland” the smallest circular signature recognizable by touch must have 5 mm diameter.

Each signature included in the “Geographical Atlas of Poland” consisted, as it was mentioned in chapter 3, of elements perceived by sight and touch. The most important problem, related to point signatures, concerned such their designs, to be readable by touch and at the same time, where possible, to keep role of isomorphological character, i.e. to pass the selected features characteristic for the represented object or phenomenon. Moreover, the attempt were done to keep signatures for visually handicapped people similar to the signatures traditionally applied at school atlases, in order to respect habits of these people from the period, when they used standard designations.
The next problem, which was faced by authors of the atlas, was related to fact of designing in traditional cartography designations with increasing “optical” aggression. It is not difficult to design such designations for visually handicapped people, but the problem arises, when they must be used both by blind and visually handicapped.

On the map “Cities” method of quantitative signature was applied. The presented cities were divided into four groups according to number of inhabitants. Signatures assigned to these groups were designed using habit from traditional cartography, assigning increasing optical weight. The attempt was done to ensure, that reading of these signatures by touch gave similar effect of changeable “touch aggression”. For this purpose sizes of signatures and forming them line widths were made different.

Similar situation happened, when areas with quantitative characteristics were marked on the maps. As an example table called “Precipitation; Vegetation period” can be used. For marking such areas in traditional cartography colour(s) with different intensity is used in such a way to match its optical aggression with increase of intensity of phenomenon. This rule was kept for visually handicapped people. Increasing length of vegetation period was presented using green colour with increasing intensity. It was tried to keep this rule while selecting convex texture readable by touch. The smallest intensity of phenomenon is “flat” without texture, mean intensity was exemplified by “low” small-grained texture, while the highest by “high” coarse-grained texture.

It’s worth mentioning, that while editing “Geographical Atlas of Poland, it was found, that on one map three or maximum four different textures can be used (without “flat” non-textured areas). Larger number of convex textures on one map is very difficult to read correctly.

Majority of signatures, which were used on the maps of Geographical Atlas of Poland, were based of examinations of group of signs, lines and textures, being the integral part of new technology.

3. MAP DESCRIPTIONS

All objects and phenomena, which needed description, were described twofold: traditionally for visually handicapped people and in Braille alphabet for blind people.

Preparing descriptions for visually handicapped people the same rules of placing onomastics, which are applied in traditional cartography, were sued. However, most of descriptions, also of mountain ranges and geographical regions, were put horizontally, as they are best readable in such an orientation. Rivers were the only exception; they were described parallel to their course. Large lettering was applied with simple font, as italics are worse for reading. As due to the applied technology for map production descriptions could not be black, other intensive and contrast colours were used: navy-blue, dark green and red.

Braille alphabet applied on the maps for description of objects and phenomena for blind people takes much more space than traditional description. Therefore, names of cities, rivers and other elements of map content were mostly described with the use of abbreviations, applying one, two or three signs. For each group of objects located on the maps (e.g. for states, cities, rivers, lakes) separate rule of creating abbreviations was prepared. Abbreviations describing the selected groups of objects, among others rivers, lakes, canals, were preceded with one-sign “key”, which additionally assigns a given abbreviation to signature.

Full names of all objects, which were described on the maps with abbreviations, were included in the volume “Geographical Atlas of Poland. Glossary”. This appendix, prepared totally in Braille alphabet, is an integral part of the atlas. Besides list of abbreviations blind reader will find in it explanations of the above mentioned signs-“keys” and instructions how to use the atlas correctly.

In “Geographical Atlas of Poland”, apart from maps and editorial part there is a text called “Methodical instructions for teachers and parents”, in which some proposals are included, how protector of a blind person can help in using atlas. “Geographical Atlas of Poland” was issued in 2004 by the Head Office of Geodesy and Cartography in close cooperation with Polish Union of Blind People. Editorial works were carried out within the Consultant Group for Preparation of Maps for Blind and Visually Handicapped People, affiliated to the Surveyor General of Poland.

The whole edition – 200 copies – was purchased and is already used by blind and visually handicapped people. Presently authors of atlas are waiting for opinions of first users, which will be the best evaluation of their work.
SHORT BIOGRAPHY NOTES

Magdalena Polak
Graduated from the Faculty of Geography and Regional Studies, University of Warsaw, cartography specialization. She is the member of the Consultant Group for Preparation of Maps for Blind and Visually Handicapped, affiliated to the Surveyor General of Poland. Since 2004 she is the member of Commission of Maps and Graphics, International Cartographic Association. Since several years she has studied problems of preparation of maps for blind people. She is the author of “Geographical Atlas of Poland”.

Izabella Krauze-Tomczyk
Geographer. She works at the Head Office of Geodesy and Cartography, studying problems of preparation of maps for blind people since the beginning of these works (1983). She is the member of the Consultant Group for Preparation of Maps for Blind and Visually Handicapped, affiliated to the Surveyor General of Poland. She is the Secretary of the Commission for Standardization of the Geographical Names Outside of Poland.