

CRITICAL REMARKS REGARDING THE CONTEMPORARY BIBLE ATLASES

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Abstract

The contemporary Bible atlases which are on the market represent various contents and forms of cartographic presentation. Some of these atlases can be classified as typical historical atlases with small amount of geographic contents. Generally in all Bible atlases the geographical content is very limited. The basic disadvantage is a lack of general geographic maps which could be used as the reference maps for editing various thematic maps. The thematic maps prepared by several authors are not homogeneous due to the lack of common reference map.

The geographic grids are only very seldom presented on the maps. The information about the applied geographic projections is omitted. In the same atlas particular maps are presented in various projections causing different perception of the same territory. The orography is not correctly presented and the spot heights are missing. Generally the hydrographic network is very limited. On several maps there is no information regarding scale. On the Bible thematic maps, very seldom the information referring to the particular Bible books, chapters and verses is given.

The performed analyses indicated that in the process of cartographic edition of the Bible maps the uniform symbols and other cartographic standards were not applied. The above indicated remarks and errors can be omitted when the atlases will be elaborated by the interdisciplinary teams composed by the Biblicists, cartographers, geographers and historians.

Introduction

The Bible cartography constitutes a very special kind of cartography which can be classified within the historical cartography. This special kind of cartography is determined mainly by the following factors: a very long time of the Bible history and a very huge area on which the events described in the Bible occurred. In this long historical time, which stretches over 4 000 years, a lot of changes occurred on this territory such as changes of the boundaries of countries, changes of settlements and towns as well as the changes in the land cover.

The Bible cartography is represented by the three basic forms: Bible atlases, Bible maps (e.g. wall maps) and maps incorporated in the various editions of the Bible. The Bible atlases represent the most valuable cartographic material for presentation of the Bible

events. The Bible atlases appear both in the analogue form and in the digital-computerized form. Contemporary the analogue atlases are edited by various editorial houses.

There are several Bible atlases representing various content and various approaches to the cartographic presentation of the Bible events and territory on which these events occurred. The performed analysis of the content of the Bible atlases indicated that they can be divided into three groups according to the interrelation between: the geography of Bible territory, the history of Bible events, universal history. There are various proportions in these interrelations in particular atlases. It is necessary to underline, that sometimes the atlases constitute a set of various types of maps but, on the other hand, there are atlases which present the fusion of maps with the explanatory texts. Hence they can be treated as the monographs of the Bible history illustrated by maps.

The extend of the Bible territory sometimes cover total area of the history described both in the Old and the New Testament but in some atlases it is limited to the territory of the events which occurred only in the Old Testament. Also the extension of the historical period is various. In some cases it is strictly related to the history of the Bible events, sometimes it is limited to the selected periods, but in several cases it is extended beyond the Bible period.

Evaluation of *status quo* of the Bible cartography

The evaluation of the *status quo* of the Bible cartography, performed in the last years in the Institute of Geodesy and Cartography in Warsaw, indicated that most of the atlases, which are on the market, present different quality related both to the geographic and thematic content and to the cartographic presentation of maps in these atlases (Linsenbarth and Wrochna, 2007).

The performed analysis was related to the Bible atlases which were edited in the last decade in Poland. All these atlases are the polish editions of the foreign atlases in which the text was translated into Polish and the geographic names were replaced by Polish geographic names. The following atlases, representing the various types of such atlases, were analyzed and evaluated:

- Historical Bible Atlas (Galbiati and Serafini, 2004)
- Great Bible Atlas (Pitchard, 1997)
- The Bible Places (Team Media Limited, 2005)

The general aim of this paper is focused not only on the remarks to the particular atlases but on the main requirements for Bible atlases and on the indication of the mistakes, errors and omissions which occur in such atlases. The applied approach was based on a very detailed analysis of particular atlases and hence the general critical remarks were generated. The presented remarks are related to the most important parts of the Bible atlases.

Geographic reference data

The geographic reference data constitute the most crucial condition in the edition of the Bible atlases (Linsenbarth and Drachal, 2009). The geographic reference data in the form of the geographic reference maps should be used in the further process of elaboration of the historical or Bible event maps. In such a case the homogeneity of all various maps in the atlas can be achieved. In other case there will be lack of harmonization between thematic maps. The performed analysis indicated that in many cases this requirement was not fulfilled. In the following chapters the influence on the homogeneity of the thematic maps will be presented.

Applied projections

The selection of the proper geographic projection is very important for the preparation of the particular maps. Due to the huge area of the Bible events as minimum two types of projections should be applied: one for the larger territory and another one for the smaller territory e.g. for the old Palestine territory on which most of the Bible events occurred. Also the shape of these territories has to be taken under consideration. The shape of the territory, on which all the Bible events occurred, is extended in East-West direction, while the old Palestine territory is extended in North-South direction.

Much more danger is the application of various projections for particular thematic maps in the same atlas making completely different image of the same terrain. Contemporary cartographic technologies allow to apply various projections which make the image very attractive from the observer point of view, but introducing a very big distortion in the presentation of the terrain.

How these requirements are applied in practice. In contemporary atlases only in few cases the information referring to the applied projection is given. In many atlases such information is omitted. Also in many cases there is a lack of the geographic grid lines both on the reference map and on thematic maps.

In the Bible Historical Atlas (Galbiati and Serafini, 2004), in the introductory part, the physical map of Palestine is placed and it can be treated as a reference map. This reference map is related only to the Palestine territory which is divided into two parts: northern and southern. The map is without the geographical grid lines and there is a lack of information regarding applied projection.

In the Great Bible Atlas (Pitchard, 1997) two general semi-physical maps of the Palestine territory are located at the front and on the last page. The maps can be treated as geographic reference maps. The maps are at the scale 1:500 000 and have the coordinate grid lines every 10 km. Unfortunately the geographic grid lines are missing. Instead of the geographic grid the authors applied local coordinate grid system which is used only on the territory of the Near East. On this map the relief is presented by the hypsometric method arranged in four intervals: below sea level, 0-100 m, 100-500 m and over 500 m. Furthermore only generalized hydrographic network is presented and settlements with their names are located. On the map front page the settlements mentioned in the Old Testament are presented while on the last page the settlements

from the New Testament are indicated. On one of the last pages there is physical map of Palestine territory, with the geographic grid lines (every 30') but the scale is not given. Beside hydrographic network also the relief is shown by the shading method.

In the Great Bible Atlas (Pitchard, 1997) the thematic maps are prepared in various projections with various orientations. The names of applied projections are not given. Sometimes these projections are very fantastic, causing a very large deformation of the presented territory. Hence the same territory on various maps looks completely different. The application of various projections caused many errors in location of the same geographic objects in relation to the geographic grid lines. Also the shapes of the lakes are completely different (e.g. Lake Genezaret).

In the atlas under the title: "Bible Places" (Team Media Limited, 2005) one part of the maps has no geographic grid lines and information about applied projection is missing. On the other part of maps the geographic grid lines are presented. The general geographic map, located at the introduction part of the atlas (page 11), which is covering the total area of the Bible events, is without geographic grid lines. The geographic projection is not indicated, but the applied projection has largely deformed the proper shape of the territory: the map is enlarged in North-South direction and shortened in East-West direction, what is very well demonstrated on the Sinai and Asia Minor. There is another general geographic map (page 17) prepared in another projection which present completely different image of the mapped territory. It is necessary to underline that in such cases the linear scale - shown on these maps - is useless.

The thematic maps included in the atlas have the grid lines every 30'.

Map scale

The scale of the maps in the Bible atlases depends both on the format of a particular atlas and on the extent of the presented territory. Due to the fact that some of the events described in the Bible occurred on the huge areas and others occur on the limited territory, the application of two scales is preferred. In practice in the Bible atlases there are applied several scales for preparation of thematic maps. The scale of the maps should be given both on the reference map and on thematic maps. The map scale should be presented as a scale bar.

In several atlases the scale information is omitted or is not adequate. For example in the Bible Historical Atlas (Galibati and Serafini, 2004) only on the physical map the scale bar is presented. In the atlas there are some other physical and thematic maps on which such information is omitted. In the Great Bible Atlas (Pitchard, 1997) only on the physical map (index map) the scale is given.

In the atlas "Bible Places" (Team Media Limited, 2005) on all maps the scale bars are drawn, but due to the applied projections in several cases they do not represent true values.

Orography

The geographic reference map should present as well as possible the geographic space of the Bible territory. Hence the terrain topography should be reflected in such a way that the reader of a map can have the most objective perception of the terrain relief. It is necessary to underline that the Bible events are strongly connected with the terrain topography.

On the reference map the terrain orography may be presented by classical hypsometric method or by the digital terrain model. The digital terrain model gives the better perception of the terrain topography, but the human perception of the relief depends on the applied methods and parameters of DTM presentation. For this purposes the DTM based both on the satellite data or aerial photogrammetric photographs can be applied. In a case of hypsometric method an adequate contour interval has to be selected for proper presentation of the particular terrain character. Very important is the identification of the tops of the hills or mountain ranges and indication of their heights. Many of the Bible events occurred on the top of the mountains such like Mount Sinai, Mount Nebo, Mount Tabor, Mount Hermon, Mount of Olives etc., hence such information are very useful for Bible readers.

In the analyzed Bible atlases the orography is presented by various methods. In the Bible Historical Atlas (Galbiati and Serafini, 2004), on the physical map of Palestine, the terrain relief is presented by semi DTM method in which the mountains are shown in brown color with application of hill shading method. The tops of mountains are indicated and the heights of these tops are given. In the same atlas there are other physical maps referring to the Middle East on which the orography is presented in the same way but in green color.

In the Great Bible Atlas (Pitchard, 1997) the orography on all thematic maps is shown by hill shading method but the spot heights are missing.

In the atlas "Bible Places" (Team Media Limited, 2005) the orography is presented by hill shading method. All the maps included in the atlas are printed in colors. On one part of the maps the mountains are shown in green color and on the other part of maps the relief is presented in light brown color. On these maps spot heights are not given.

Hydrographic network

The next very important element of the reference map and of the thematic maps is the hydrographic network, which is strongly connected with the orography. The main rivers, wadies as well as the coast lines of the lakes and seas should be presented. In the case of the Bible territory there is a huge depression of the Jordan Valley which should be depicted on the reference and thematic maps.

How these requirements are fulfilled in various atlases. In the Bible Historical Atlas (Galbiati and Serafini, 2004), on a physical map, a very densely hydrographic network is presented. Rivers are shown by white full lines and wadies by white broken lines. All rivers and wadies have their names. For the Genezaret Lake the water level is given (-209 m) but without information to which period this value is referred. But on the Dead

Sea this information is missing. On this physical map the road network is omitted. In the introduction part of the atlas there are several historical maps referring to particular historical periods. On these maps Euphrates River and Tigris River are reaching separately the Persian Gulf but they are merging into one ca 100 km before the Gulf. In the Great Bible Atlas (Pitchard, 1997) the hydrographic network is very generalized and limited only to the main rivers. The same remark is related to the atlas "Bible Places" (Team Media Limited, 2005) in which only the main rivers are presented. Only some of these rivers have names. There is the incorrect distinction between rivers and wadies.

Road network

The road network plays a very important role in the presentation of the Bible events hence it is necessary to present all the ancient roads existing in the given period of the Bible events.

On the physical map included in the Bible Historical Atlas (Galbiati and Serafini, 2004) the road network is omitted. In the Great Bible Atlas there are two maps dedicated to ancient roads: one is presenting the old roads in Palestine while the second one shows the roads on the Sinai. On all other thematic maps the roads are missing. In the atlas: "The Bible Places" (Team Media Limited, 2005) on all maps the roads are not drawn.

Land cover

The land cover should be also depicted on the reference map but should be limited to the main categories. Generally the land cover is not depicted in the Bible atlases. Only in the Great Bible Atlas (Pitchard, 1997) there is a separate map dedicated to the land cover.

Towns and settlements

In the case of the Bible atlases the presentation of towns, settlements and villages is very complicated. There are several reasons of such situation. Many of the places mentioned in the text of the Bible are - up to this date - not located. Many of these places changed their names during the history (e.g. Rabbat - Ammon - Philadelphia). There are various approaches to this problem. The best solution is to give the present name on the general physical map but on historical maps referring to the particular periods, the names which were used in these periods should be used.

For example in the Bible Historical Atlas (Galbiati and Serafini, 2004) on the general physical map the contemporary names are given. In the same atlas there are two additional maps presenting two periods of the Bible history: one from the very beginning to the Persian period and the other one referring to the Hellenistic and Roman Period. Hence on these maps the names which were used in these periods are given.

Another solution was applied in the Great Bible Atlas (Pitchard, 1997). On the front page of the atlas there is a map with all settlements which appear in the Old Testament, while on the last page there is another map referring to the New Testament.

Time changed geographic elements

It is necessary to remember that some of the environment elements were changed within the long time of the Bible history. The most permanent element of the map content is the terrain orography which generally is stable but in some cases, due to the volcanic eruptions, earthquakes, land slides etc., the local changes occur. The hydrographic network belongs to this category which can be change significantly. The large rivers existing in the ancient times disappeared and presently changed into wadies. There are coast line which changed due to the variation of water level. In the case of the Bible cartography the attention should be paid to the changes of water level of the Dead Sea. In the time of the New Testament the water level of the Dead Sea was ca 300 m below sea level and at the present days is ca 420 m below sea level. In the last years the water level is lowering ca 80 cm each year. The most significant changes occurred in the land cover. The huge territories which in the time of the Old Testament were covered by forest (e.g. Bashan area) were completely changed due to the human activity. Some of the ancient lakes disappeared like Lake Hule in old Palestine, which was meliorated in 1930 and now does not exist. There were many changes of the state boundaries, changes in the settlements and towns – some of them disappeared, some new were erected. The above mentioned changes caused serious problem in map preparation, hence on the maps the information should be given to which historical period the map is referring. How these requirements are applied in practice. Generally in all analyzed atlases the information regarding referring to the time changing elements are missing or only partially introduced.

Thematic maps

Generally there is a lack of reference map which should be used for the elaboration and edition of thematic maps. This resulted in not homogeneous presentation of thematic maps hence the same geographical objects have sometimes different location on various thematic maps. This is a very serious problem in most of the analyzed atlases. In the process of preparation and edition of the thematic maps, sometimes a large groups of branch oriented specialists are involved hence the maps are prepared in various manners and in accordance to the different schools of cartography. In many cases in the same atlas several projections are used, hence it is very difficult to compare the maps because the same territory looks completely different. In many atlases there is a lack of the geographic grids on the maps. Particular maps are printed in various scales, what complicate the evaluation and perception of the map contents.

In the Bible atlases various proportions of thematic maps referring to the particular periods of Bible events occur. In some atlases the same period is characterized by one map, while in the other atlases by several maps. Of course this depends on the

appropriate idea of the atlas authors and on the needs of the final users to which the atlases are addressed. The number of maps in atlases varied from 40 up to more than 200. Also the format of atlases is various.

In the Bible Historical Atlas (Galbiati and Serafini, 2004) there are 180 thematic maps presenting both the historical events and Bible events. They are linked to the chosen historical periods. All these maps are without geographic grid lines and without scale. The content of these maps present only generalized hydrographic network. The orography and the road network are missing. The particular territories are presented in various colors. To each map the description of the presented events is added.

In the Great Bible Atlas (Pitchard, 1997) the thematic maps are printed in various projections and with various orientations. On all maps the geographic grid lines are presented. The thematic content is shown in light brown color presenting very generally the terrain orography. The application of various projections affected the proper location of towns and settlements. The same towns are located in various positions in accordance to geographic coordinates. For example the old town Karkemisz is located on the different sides of Euphrates River.

In the atlas "The Bible Places" (Team Media Limited, 2005) besides the maps covering large areas there is a lot of small thematic maps dedicated to the chosen Bible events. All of them have similar character and similar color approach. They are presenting Bible places in the given periods and the traces of military campaigns. The boundaries of territories are shown in broken white lines. To each map a short description is added.

In the case of atlases which have purely geographic character the properly prepared legend is very important. In such cases the title of the map and the legend constitute the only information about the thematic content of the map. Different situation is in the case of atlases which have double character i.e. the thematic maps connected with the text which explains their content. Not very often there are references to particular places in the Bible text. This remark refers to title of the map, to the map contents and to the explanatory text. In several atlases there is a lack of full indexes of all geographic names presented on maps. Only in seldom cases there are several additional maps and information such as geological maps, geomorphologic maps, climatic maps or description of geography and general history of the Bible territory.

Indexes to the place names

All the analyzed atlases have the indexes of the place names but they are prepared in various manners. Usually there are common indexes both to the geographical place names and to the names of persons. In the Bible Historical Atlas (Galbiati and Serafini) there is a common index both for names and places. In the Great Bible Atlas there is so called geographical index. In the atlas of Bible places the common index is attached, but with indication which names appear on the maps and which appear only in the explanatory text.

In the Great Bible Atlas (Pitchard, 1997) many of the geographical names appearing on the maps are omitted in the index.

Conclusions

The performed analysis of the Bible atlases indicated that generally they are not fulfilling the cartographic requirements. The Bible atlases are prepared separately by various authors hence the maps incorporated in these atlases present different forms of cartographic presentation. There are atlases which are rather collection of various types of maps prepared in various scales on the basis of different editorial approaches. The general physical maps of the Bible territory are generally missing. In many cases the terrain relief is depicted incorrectly. Due to the lack of the reference map which should be used in the process of thematic maps elaboration the maps are not homogeneous. On maps included in the atlases the various geographic projection are applied causing different perception of the mapped territory.

The performed analysis of the contemporary Bible atlases indicated, that the Bible atlases should be prepared by the interdisciplinary team composed of the Bible researches, cartographers, geographers and historians.

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