

## THE ANALYSIS OF ILLUSTRATIONS IN THE FOURTH GRADE GEOGRAPHY TEXTBOOKS

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### **ABSTRACT**

*This study focuses on the analysis of the illustrations found in five different Geography textbooks in Romania. The analysis is based on several criteria: number, size, clarity, pedagogical usefulness. The following conclusions have been drawn: the illustrations are numerous; most of the illustrations are too small and unclear to be efficiently used in the teaching activity; the purpose of some materials is purely illustrative; some illustrations are overcharged with details, which prevent children from understanding them. Authors and publishing houses are advised to choose the illustrations in the fourth class Geography textbooks more carefully.*

**Keywords:** *map, photography, schematic diagram, diagram, criterion*

### **INTRODUCTION**

The present qualitative research was conceived as a result of the realisation that the fourth class Geography textbooks do not have the most suitable illustrations for both the representation of the geographical aspects provided in the text and also for the facilitation of their understanding. The crucial question one has sought to answer is: what are the common

features of Geography textbook illustrations, relevant for the learning process, on the basis of which the illustrations can be analysed? This study focuses on the identification of some criteria for the analysis of the illustrations found in the Geography textbooks and on the examination of the maps, photographs, schematic drawings and diagrams presented in the textbooks in compliance with these criteria.

*The main objective* of the research is the examination of the illustrations in the fourth class Geography textbooks. The secondary objectives are the following: 1) The analysis of the number of illustrations; 2) The size of the illustrations; 3) The clarity of the illustrations; 4) The educational usefulness of the illustrations. On a global scale, there are many different criteria used for analysing textbooks: the quality of the scientific content of the textbook; the quality of the pedagogical transposition of the scientific content; the quality of the drawing up, the quality of the illustration (Segun, 1989; Gerard & Roegiers, 2003; *apud* Păcurar-Pop, Ciascai, 2010). Our aim is not to analyse the textbook illustrations by following those precise criteria, nor to compare them to other illustrations from foreign textbooks. The ultimate purpose of our study is to urge the authors of Geography textbooks and the Romanian publishing houses to rethink the illustration pattern they intend to accustom students with, to adapt it to the students' level of understanding and knowledge, rather than its mere adaptation to the publishing fees only.

## **THEORETICAL BACKGROUND**

In Romania, the alternative textbooks have been assessed based on the following criteria: correlation between the content and the school curriculum; content; language level; pedagogical method; the manner in which it is presented and edited; illustration; degree of originality; quality of the material (the printing quality). The assessment is based on 2-6 factors which are described in terms of sub points ranging from 5 to 15, depending on the complexity of the criterion (Copilu, Copil, Dărăbăneanu, 2002, *apud* Păcurar-Pop & Ciascai, 2010, p. 2).

Aiming at evaluating the illustrations in Biology textbooks, Păcurar-Pop & Ciascai (2010, p. 2) propose three categories of criteria: whether the illustrations are clear enough; whether the presence of an illustration is justified; whether the illustrations have numbers and captions.

In the specialised literature from Romania, there are no studies related to the illustrations in Geography textbooks. Dulamă (2009) argues that the diversity of images and the clarity of graphs ought to be some of the key features to the internal organisation of the textbook. The marking scheme drawn up by the same author used in assessing the illustrations of Geography textbooks includes a general criterion the illustrations in question should respect: *the existence of an appropriate number of graphs*

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*in each lesson.* As related to the photos found in textbooks, the author proposes the following criteria: *clarity*, which facilitates the analysis and the interpretation of the content; *size*, which allows the analysis and the interpretation of the content; *appropriate number of illustrations* in accordance with the content of the lesson and the time resources; *indication of author/ source*; *numbering of each photography*. Regarding the maps found in textbooks, she proposes the following criteria: *relevance* to the content of the lesson; *correctness of execution* in compliance with the international conventions (map scale, map legend, map orientation); *accuracy of content*; *clarity*, which contributes to a better analysis and interpretation of the content; *size*, which allows the analysis and interpretation of the content; *appropriate number of maps* in accordance with the content of the lesson and the time resources; *the amount of details used*; *indication of author/ source*; *numbering of each map*. Graphs found in the given textbooks are assessed by the following criteria: *relevance* to the content of the lesson; *correctness of execution*; *accuracy of content*; *clarity*, which contributes to a better analysis and interpretation of the content; *size*, which allows the analysis and interpretation of the content; *appropriate number of graphs* in accordance with the content of the lesson and the time resources; *indication of author/ source*; *numbering of each graph* (2009, 2012).

As far as the usefulness of illustrations is concerned, Dulamă states that: "Images are not introduced into the lesson with the sole purpose of having them exemplify a process or a phenomenon, but they also represent the object of analysis on the basis of which one acquires new information" (2001, p. 101).

## MATERIAL AND METHOD

*The content of the research.* The illustrations in five different fourth class Geography textbooks were analysed: *Geografie. Manual pentru clasa a IV-a* by Manuela Popescu and Ștefan Pacearcă (2006), Bucharest: Aramis Publishing House; *Geografie. Introducere în geografie. De la localitatea natală la planetă* (2008) by Octavian Mândruț, Bucharest: Corint Publishing House; *Geografie. Manual pentru clasa a IV-a* by Marcela Peneș and Ioan Șortan (2006), Bucharest: Marcela Peneș Publishing House; *Geografie. Manual pentru clasa a IV-a* by Elena Ban, Nicolae Cruțeru, Dorina-Maria Borza, Livia Buchilă and Olguța Morariu (2006), Bucharest: Niculescu Publishing House; *Geografie. Manual pentru clasa a IV-a* by Niculescu and Viorela Anastasiu, Celina Iordache, Dan Dumitru (2011), Bucharest: Editura Didactică și Pedagogică (EDP). The illustrations in question were analysed under three chapters: "Geographical elements of the near and local

horizon”; “Geographical elements of Romania”; “Romania in Europe and on the globe”.

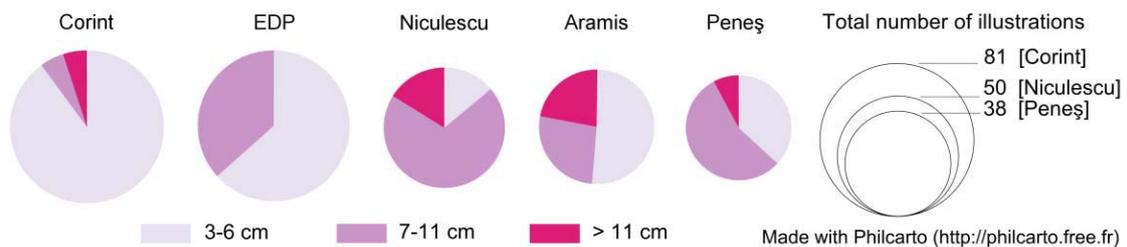
*Research methods.* The enumerative and subjective analyses were employed in the analysis of photographs, maps, diagrams, and schematic drawings. The following criteria were used in the analysis: number, size, clarity, pedagogical usefulness.

## RESULTS

**1). The number of illustrations.** We present in the following tables and figures the number and sizes of the illustrations as they are grouped in the three chapters.

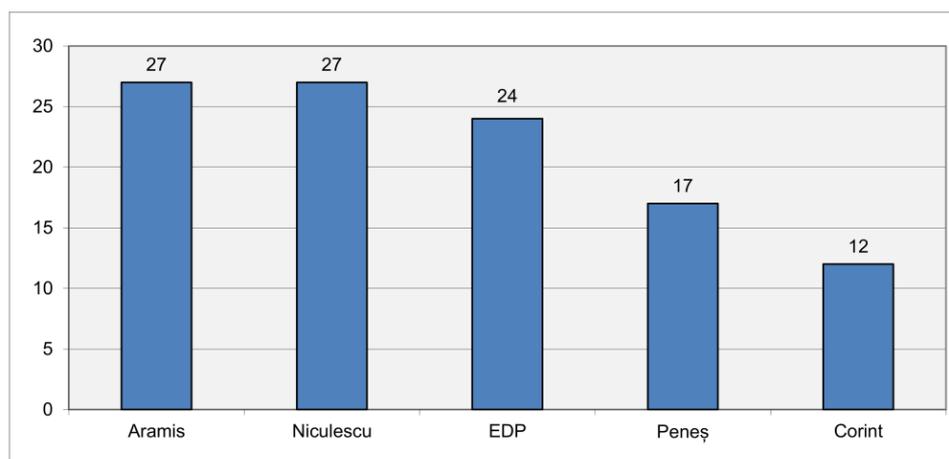
**Table 1.** The number of illustrations in the chapter “Geographical elements of the near and local horizon” and their sizes

Publishing House	Total number of photographs/schematic diagrams	Number of images according to the size of the width/height		
		3-6 cm	7-11 cm	over 11 cm
Aramis	45	23	12	10
Corint	81	73	4	4
Peneş	38	14	21	3
Niculescu	50	7	35	8
EDP	79	50	29	-



**Fig. 1.** The number of illustrations in the chapter “Geographical elements of the near and local horizon” and their sizes

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**Fig. 2.** The number of maps existent in the chapter "Geographical elements of Romania"

**2) Size of illustrations.** We present the sizes of the illustrations grouped in the three chapters in the tables and figures bellow:

**Table 3.** The number and sizes of maps in the chapter "Geographical elements of Romania"

Publishing house	Total number of maps analysed	Sizes of maps	
		Under 10x15 cm	Over or equal to 10x15 cm
Aramis	23	6	17
Corint	7	1	6
Marcela Peneş	11	5	6
Niculescu	15	2	13
EDP	17	4	13

**Table 4.** The number and sizes of photographs in the chapter "Geographical elements of Romania"

Publishing house	Total number of photographs/ schematic drawings	Number of images according to the size of the width/height		
		3-6 cm	7-11 cm	Over 11 cm
Aramis	106	67	10	29
Corint	57	50	7	-
Peneş	87	40	42	5
Niculescu	103	50	40	13
EDP	40	20	2	18

**Table 5.** The number and sizes of maps in the chapter "Romania in Europe and on the globe"

Publishing House	Total number of maps analysed	Sizes of maps	
		Under 10x15 cm	Over or equal to 10x15 cm
Aramis	5	1	4
Corint	7	2	5
Marcela Peneş	6	1	5
Niculescu	3	-	3
EDP	9	1	8

**Table 6.** The number and sizes of photographs in the chapter "Romania in Europe and on the globe"

Publishing house	Total number of photographs/ schematic diagrams	Number of images according to the size of the width/height		
		3-6 cm	7-11 cm	Over 11 cm
Aramis	32	18	14	-
Corint	4	3	1	-
Peneş	9	6	2	1
Niculescu	16	12	4	-
EDP	13	11	1	1

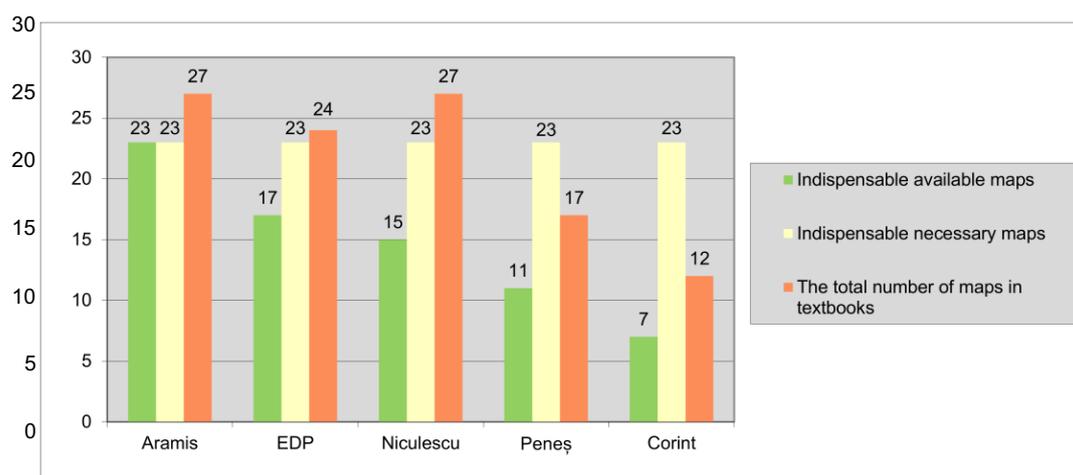
**3). The usefulness of the illustrations.** In the first column of table 7, we have mentioned the name of the maps that are absolutely necessary for the study of the Geography of Romania and in the next columns we have specified whether the maps exist in the textbooks under analysis.

**Table 7.** Maps that are necessary for the study of Geography

Map	Publishing House				
	Aramis	Corint	M. Peneş	Niculescu	EDP
Romania's borders and neighbours	X	X	X	X	X
Major areas of land	X	X	X	X	X
Climatic layers	X			X	X
Rivers and lakes	X	X	X	X	X
The Danube	X				
The Black Sea	X			X	
Vegetation layers	X				
The biggest cities	X	X		X	

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Underground resources and economic activities	X	X	X	X	
The Carpathian Mountains	X				
The Eastern Carpathians	X		X	X	X
The Southern Carpathians	X		X	X	X
The Western Carpathians	X		X	X	X
The Transylvanian Plateau	X			X	X
The Sub-Carpathians	X			X	X
The Western Hills	X				X
The Getic Plateau	X				X
The Moldavian Plateau	X				X
The Dobrogea Plateau	X	X	X		X
The Romanian Plain	X		X	X	X
The West Plain	X			X	X
The Danube Delta	X		X		X
The administrative units	X	X	X	X	X
<b>TOTAL</b>	<b>23</b>	<b>7</b>	<b>11</b>	<b>15</b>	<b>17</b>



**Fig. 3.** The number of maps which are absolutely necessary for the study of the Geography of Romania

In the first column in table 8, we have mentioned the name of the maps that are absolutely necessary when studying the chapter "*Romania in Europe and on the globe*", and in the next column we have indicated whether the precise maps exist in the textbooks under analysis.

**Table 8.** The maps which are absolutely necessary in Europe and on the globe"

Map	Publishing house				
	Aramis	Corint	M. Peneş	Niculescu	EDP
The physical map of Europe	X	X		X	X
The political map of Europe	X	X	X	X	X
The map of the European Union	X	X	X		X
The map of the continents (contour)	X	X	X		X
Hungary					
Bulgaria					
Serbia					
Ukraine					
The Republic of Moldova			X		
<b>TOTAL</b>	<b>4</b>	<b>4</b>	<b>4</b>	<b>2</b>	<b>4</b>

## DISCUSSIONS:

**1) The analysis of the number of illustrations.** In the chapter "Geographical elements of the near and local horizon", the number of illustrations differs greatly from one textbook to the other. The biggest number of illustrations can be found in the Corint and EDP textbooks (81, 79 respectively), and the smallest number can be found in the Peneş textbook (38). The situation changes when it comes to the chapter "Geographical elements of Romania", in the Aramis and Niculescu textbooks there are 27 maps and 106 and 103 photographs, respectively, whereas the Corint textbook has only 11 maps and 57 photographs and the EDP textbook - 17 maps and 40 photographs. In the chapter "Romania in Europe and on the globe", there are big differences related to the number of illustrations: the Aramis textbook has 32 photos, whereas the Corint textbook only 4.

**2) The analysis of the size of illustrations in textbooks.** In table 1, one can easily notice that, in the chapter entitled "*Geographical elements of the near and local horizon*" from all the textbooks, there are, generally

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speaking, photographs or maps of small sizes, notably in those textbooks published by the Corint and EDP Publishing Houses. The biggest number of medium-sized images can be found in the Niculescu and Marcela Peneş textbooks, whereas such medium-sized pictures are hardly available in the textbook published by the Corint Publishing House.

Taking into account the fact that textbooks have limited space to be covered, we urge authors to leave aside those graphs which are unnecessary, and thus the amount of space reserved for illustrations could become bigger, and the quality of the textbook would increase as well. As one can notice, all the textbooks have in common illustrations that could become very useful in the teaching process if their size exceeded 5x3 cm, the size they currently measure.

In general, the small size of maps is another problem textbooks share. In order to be successfully used in the teaching process, a map, irrespective of its type, should occupy at least half of a page, thus, it should measure about 10x15 cm (or A5 paper size 14,8x21cm). By means of following this criterion, maps have been divided into two categories which include, on the one hand, those photos that have smaller sizes and, on the other hand, those having this size or even exceed it. Only the maps found in the chapter: "*Geographical elements of Romania*" (Table 3), and which met the necessary criteria presented in the given study, have been analysed according to it, this investigation resulting in the conclusion that the majority of maps comply with the size standard.

Alongside maps, photographs and schematic diagrams are of utmost importance when it comes to studying *the Geography of Romania*. They should have the appropriate size so as to allow the perceiving of the essential characteristics of the real-life geographical aspects, landscapes, respectively. Similarly to the previous chapter, textbooks lack photographs of the appropriate size from the chapter "*Geographical elements of Romania*" (Table 4). The photographs are small, sometimes unclear and their purpose is more of an illustrative type, being at the same time, in some cases, doubtful. The same size criterion used with maps has been followed in the classification of photographs. An analysis of table 4 reveals that a very small number of the pictures depicted in textbooks meet the size criterion that would make them pedagogically useful. Despite being rich in valuable illustrations (especially the Aramis and Niculescu Publishing Houses textbooks), these cannot be exploited in class due to their very small size, barely allowing the student to distinguish the given landscape. Considering the limited space textbooks have for photographs, it would be more useful to introduce just a small number of bigger photographs to better serve their purpose instead of many small pictures.

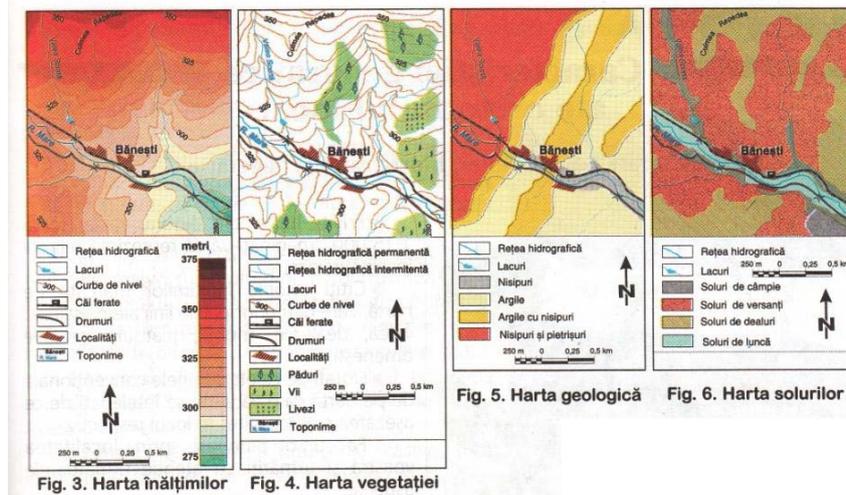
As far as their size is concerned, the maps found in the chapter "Romania in Europe and on the globe" comply with the size standards, being sufficiently big in order for the students and the teacher to be able to use them easily during the teaching activities. There is one exception.

though, the maps from the Corint textbook, which are big enough, but are unclear, and at times crowded with information, reason why they cannot be used in the teaching activities. Even though there are numerous photographs, teachers cannot make use of them with a pedagogical purpose in mind because their size is too small.

**3) The analysis of the degree of clarity of the illustrations in textbooks.** By clarity one understands the quality of the graphic material from a visual point of view. Irrespective of size, one image should allow the clear distinction between the objects presented. Differences between textbooks have been discovered. The clearest illustrations are found in the Aramis textbook, as it has only drawings in the first part, the photographs being introduced only in the second part. Regardless of the type of the graphic material presented, the quality is the same, the student having the opportunity to easily perceive the main aspects of the image. The same occurs with the EDP and Marcela Peneş textbooks. The Niculescu textbook has photographs of a good quality too, and at times, their quality is even better. The Corint textbook includes schematic diagrams and photographs which are relevant for the lessons as far as their content is concerned, but unclear and almost impossible to use in class due to the printing/editing conditions of the textbook.

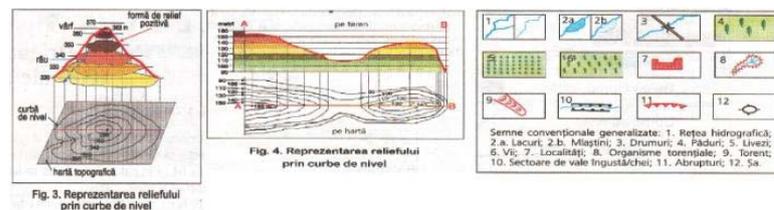
**4) The analysis of the usefulness of the illustrations in textbooks.** When analysing the usefulness of the illustrations, both the content of the lessons and the students' level of knowledge have been taken into account. The students start using maps for the first time in the fourth class. For this reason, they should include only brief and important information, without too many details. The excessive use of conventional signs and the great variety of map types creates difficulty for students in understanding their content. Take for example the Niculescu textbook, where, in the lesson entitled *Map orientation. Maps of the local horizon* (page 13), six cartographic items are provided for analysis (the topographic map, the height map, the vegetation map, the geological map, the soil map and the tourist map). These maps can only have an illustrative purpose for 4th graders as they are unable to perceive an image of the same territory "in layers" and they cannot understand the differences and similarities as they do not have the necessary previous knowledge.

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**Fig. 4.** Maps of the local horizon that are not adapted to the students' age (E. Ban, 2006, p. 13)

The schematic diagrams, in which the passing from the three-dimensional representation to the two-dimensional one is presented through level curves, are difficult to understand by children too, especially as there are no practical exercises that might teach them the dimensional representation of the data from the field. We choose not to comment on the mistakes present in figures 4 and 5 as they will represent the object of another study.



**Fig. 5.** The representation of land areas through level curves (E. Ban, 2006, p. 11)

Taking into account the manner in which Geography is studied in the fourth class, starting from the general features of the natural setting and then focusing on separate areas of land, we consider that at least one map should be used in each lesson. A brief inventory of all the maps from the five textbooks under analysis reveals differences as regards their number. The smallest number of maps can be found in the Corint textbook (12), whereas the biggest number of maps is in the Aramis and Niculescu textbooks (27) (Table 7).

We consider that the study of the Geography of Romania cannot be efficient enough without a set of maps that might allow students shape an overview of the country's territory (the map of the major land areas, the river map, the vegetation map and the fauna map, etc.), or a more detailed image (the maps of the different land areas). Out of the total number of maps this chapter might include, twenty-three have been chosen (table 7), which are considered indispensable, and the textbooks have been analysed from this perspective too. By comparing the data related to the total number of maps on the one hand, and that of the indispensable ones on the other hand, one can observe that the Aramis textbook ranks first as it includes all the selected images and a few more. The Corint textbook has only seven of the chosen maps and ranks last (table 7).

By counting the maps that are missing, we conclude that the biggest problems are in the case of the maps of land areas, more precisely during that stage of study where they are most needed. We outline the fact that the Corint textbook, instead of exclusively offering a map showing the area under analysis, it provides, lesson after lesson, a succession of the same map of the major land areas in Romania. These small-sized maps do not allow students but the mere possibility to establish the position of the land area under analysis within the general map of the country.

In the chapter entitled "Romania in Europe and on the globe", the requirements of the school curriculum cannot be met without a high quality cartographic material which ought to include: a physical map of Europe, a political map, a map of the European Union, a map of the continents (a contour map), maps of Romania's neighbour countries, and a schematic diagram of the solar system (Table 8). There should be in the form of either actual maps or mute-maps (very useful at this stage of study). In table 8, one can notice that textbooks include a maximum number of four out of the nine maps we consider indispensable. The maps of Romania's neighbour countries are ignored, even though these countries are briefly taught and students are asked to locate on the map land areas, rivers, lakes, and cities. In the textbooks belonging to the following publishing houses: Marcela Peneş, Corint, Niculescu, and EDP, authors have chosen political maps that show all the states to be studied (with an addition of the name of each state and its capital city). The Aramis textbook chose to present small pictures showing small buildings or places, each being representative for the state in question.

A mistake has been noticed in four textbooks (exception: the Aramis textbook), namely the inclusion of Pluto within the category of planets and its representation on the schematic diagram of the solar system. We would like to mention that, starting with 2006, Pluto has no longer been considered a planet, and textbooks should adapt their data in accordance with the latest scientific discoveries.

As a whole, this chapter includes incomplete cartographic information, improvements being necessary in the case of each textbook so as to ease the student's teaching process and the learning guidance undertaken by the teacher.

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**5) The correlation between the illustrations and the content of the lesson.** Irrespective of their size and type, illustrations should be linked to the content of the texts and/ or the exercises that join the written information. In most cases, this requirement is met, but there are some illustrations having only a mere illustrative purpose, as are the portraits of Julius Cesar and Pope Gregory VIII (page 19), which accompany the explanations concerning the calendars that bear their name or the portraits of peasant women from the lesson *Geographical features of the locality and the surroundings* from Marcela Peneș textbook, page 15.

The geographic information is also illustrated with the help of graphs, being especially used at the end of the secondary school and in high school, when students are capable of not only reading them, but also interpreting and even producing them. Some notions, however, such as axis, abscissa, ordinate, need to be learnt by students, for the first time, at Mathematics, and only then can they be introduced in the Geography textbooks. We mention that in the climatic graphs one operates with negative temperatures, and negative numbers are only taught in the second part of the sixth class. Taking this data into consideration, but also because they require understanding of abstract notions, we can conclude that their use is not appropriate at the primary classes. However, they exist in the Niculescu textbook, in the lesson entitled *Practical applications in the local horizon* (pages 16-17), where the temperatures of February, the annual temperatures and the climatic calendar of November are presented.



Fig. 2. Temperaturile lunii februarie

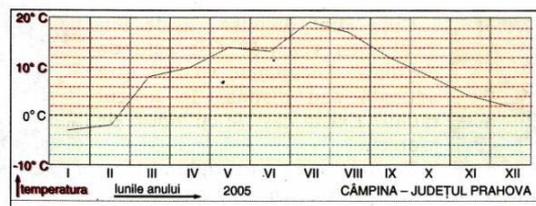


Fig. 3. Temperaturile anuale

**Fig. 6.** Examples of climatic graphs that have not been adapted to the fourth class (E. Ban, 2006, p. 16)

## CONCLUSIONS

As far as the illustrations from the fourth class Geography textbooks are concerned, the following conclusions have been drawn: the illustrations are numerous; most of the illustrations are too inefficiently used in the teaching activity; the purely illustrative; some illustrations are too crowded with details, which prevents children from understanding them, and they are also filled with mistakes. The clarity and the size of illustrations, which most of the times overpasses that of a stamp, the overcrowding with details make it almost impossible to use in class, obliging the teacher to search for other visual resources that might give him the opportunity to work with students.

In order for the first year of studying Geography to be highly successful, we recommend the authors and the publishing houses to carefully choose the illustrations that accompany the texts of the lessons in the fourth class Geography textbooks. They should be closely connected to the content of the lessons, they should have the appropriate size so as to allow students analyse them, they should offer information that is relevant and easily available at their age, and they should not include mistakes. The illustrations in such textbooks should allow a student of this age, who reads the lesson from the textbook on his own, correlate information of different types (written and cartographic).

Taking the above conclusions into account, we consider that future research could be guided into the following directions: the study of other textbooks from different grades, including the extension of the analysis criteria; the study of the Geography textbooks from other countries; the comparative study of textbooks from both Romania and different other countries.

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