

## **RENOVATION OF THE PHYSICAL GEOGRAPHY TEACHING IN THE SECONDARY SCHOOL. THE CLIMATOLOGY AS AN EXAMPLE**

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### **1. INTRODUCTION AND OBJECTIVES**

After five school years current of Geography textbooks have been used in the last year at the secondary school we carried out here an analysis of the treatment that these give to the Physical Geography and, more specifically, the climate in Spain. Other studies have already treated an general analysis of the books offering “*a number of general conclusions that serve as guidelines for debate on them rather than as a profound study on the contents of the texts and their valuation*” (Vera & De Lázaro, 2010, p. 174). It must therefore critically evaluate a study of one of the aspects that are vaguer, and certainly controversial, the climates of Spain. Working with manuals and its analysis has enabled us to detect some of the gaps with the contents for the last year at secondary school, gaps that usually come from the secondary school. This, then, leads us to propose a number of proposals concerning the possibilities of the subject in the new education law.

### **2. APPROACH TO CURRICULUM OF GEOGRAPHY**

The curriculum of Geography in the last year at the secondary school has been organized by the Ministry in five or six blocks of content, that once developed by the autonomies are specified in a variable number of units, which can reach up to 21. These, at the same time, have been treated very differently in textbooks, considering the versatility that the law provides, since the requirement arises with the development of the five blocks of content, one of which, moreover, is transversal. In this way the units have been reduced to 12 or 17, depending on the publishers, always maintaining a series

of reference contents from the Physical Geography, which plays a crucial role in the study of the entire of the Geography as point of reference.

### **3. THE GEOGRAPHY OF SPAIN IN SECONDARY SCHOOL. TRAINING HIGH VALUE OF PHYSICAL GEOGRAPHY**

The subject of Geography has had traditionally a close relationship with other materials or nearby sciences for their content such as Economics, Meteorology, Botany, Geology or Demography with which seems to have a dependency that has required a pre-treatment of issues of these sciences as a step to address the geographic knowledge of the climates, the vegetable landscapes or the relief, to give three examples.

The need to separate the Geography of these other sciences, which has created an almost insurmountable mark is justified in order to provide to the teaching of Geography of a role which is justified by its connection with the study of the territory. A study conducted in an integrated manner, both from a point of view physical and human, and in the first case in response to climatic, geomorphological and biogeographical factors. While in the analysis of the human environment are studied issues in relation to the settlement, the organization of the communication network or the exploitation of the territory.

In this spatial dimension is where the physical geography acquires its true educational value, because it is not only the center of the study of the territory, but allows connection with all other elements of the human landscape in relation to the territory.

### **4. TEXTBOOK OF GEOGRAPHY IN SECONDARY SCHOOL. VIRTUES AND GAPS**

Textbooks of Geography in the last year at secondary school have important virtues, among which point out an updated and supplemented information, with an extensive bibliography, including graphic and cartographic material in all units, and finally, a broad reference to practical activities. However, compared to these virtues major gaps and errors are observed. Among those can point out a graphic material not always in relation with what is said in the text, a map with legends that can be confusing because of its complexity. So sometimes it seems that the graphic and cartographic material is placed to fill the book, not to facilitate the study of the units.

Moreover, many books are designed more as university manuals, to which follow in their curricular development, than as textbooks designed specifically for pupils in the last year at secondary school, with a limited geographic knowledge, and an interest in geography that only reaches until the most immediately, that is, to pass at the end of the school year.

The conception of geography itself is hampered by the treatment given to it, in the sense that there is an absolute preference for the concept of Nature and Environment. This fact reveals a breakthrough in the Geography of conceptions linked to other nearby sciences such as Ecology, Biology or Phytosociology, but also is forgotten the fundamental sense of geographic science, which is the study of the territory as place of intervention of the human being: the study of climates, rivers or the vegetation of an area is carried out as a theoretical study of these aspects in Physical Geography, not as studies of Climatology, Hydrography or Vegetal Biology with applications practices.

## **5. THE CLIMATE OF SPAIN IN THE TEXTBOOK OF GEOGRAPHY: HOW FAR REACHES THE CLIMATE DIVERSITY?**

Treatment of climates in Spain follows traditional parameters, which little differ from those applicable 25 or 30 years ago. This aspect has to see with a clear continuity in the development of school materials for the last year at secondary school, where, in addition, it is turned back on innovations that have been incorporated into the scientific debate strongly, as global climate change, urban climate or climate risks.

In textbooks, it is usually opted for a series of climatic classifications that bet to justify the climatic diversity from a division in which the emphasis is on a large number of types, variants and subtypes, which confuses the compression of the climatic reality of Spain. While in this academic level for end year at secondary school the essential must be in a study of climates tending to the essential of each one of them.

The major problems find in this area are of two kinds. First, the analysis missing a single classification, widely accepted by the scientific community, resulting in a variety of interpretations of the dominant climates in Spain that is excessive for the level of detail of last year at the secondary school. Own notions of scientific debate are translated, which are aimed rather to the student than to the textbooks for the last year at the secondary school. So this situation is observed in the case of Geography Manual of Spain by Editorial Ariel, in which is proposed a classification with four types of climates: the climates of Atlantic predominance, indoor climates, subtropical climates and the climates of Mediterranean predominance, where the climate Mediterranean is restricted “*to climatic varieties directly influenced by the continental sea*”, while the influence of the Atlantic atmospheric dynamics is attributed to both “*the Cantabrian region and the south-western peninsular territory, including Andalucía Western and Extremadura*” (Gil & Olcina, 2001, p. 100).

Secondly, analyses often suffer an oversimplification, with generalizations that are not always argue properly, by which, contrast with the excessive detail in the classifications (with their types and varieties). This simplification also has errors manifest by the lack of relation among the explained classification and its representation on the maps.

An essential element in the treatment of climates is its graphical representation through the maps. Its presentation usually confirms the distribution that has already been explained in the text; but it is not always the case, sometimes there are inconsistencies between the climates explained in the text and the legends in the map, which creates confusion. The representation of mountain climates is, in all cases, underrated superficially, so that the mountains are generally included in the oceanic climate in the North of the Peninsula, or in the Mediterranean climate in other cases, without own entity as a mountain climate.

## **6. PROPOSAL FOR THE STUDY OF THE CLIMATES IN THE LAST YEAR AT SECONDARY SCHOOL**

Establishing a climate division which results, at the same time, clear and simple of the climates of Spain, is a difficult task. Undoubtedly the access to climatic data has greatly facilitated the task when we compare data, and, therefore climatic areas.

The treatment of the climates of Spain in the secondary school should take different paths of those that have been followed so far. Firstly, it must be assessed the scale at which it is worked, it does not allow a level of exhaustive detail on the map, nor, secondly, it can investigate a wide casuistries of complex study in this level. Indeed, the analysis should be based on the factors and elements of the climate, which serve as explanation to understand the existing climates in Spain, but not as a climatological analysis by itself, but as a analysis with geographical criteria.

In short, the climates of Spain have some fundamental characteristics in relation with its latitude, its location (inside or coastal), its altitude and geomorphology. In the first case it is essential understand the difference among the climates of the Iberian Peninsula and those given in the Canary Islands, with emphasis on the situation of Spain to the south of the temperate zone, and in the case of the Canary Islands near in the warm zone; in the second case we must have clear about the influence of the sea in climates, either the Mediterranean Sea or the Atlantic Ocean, and the lack of such marine influence in the peninsular; Thirdly the altitude contributes to a major thermal contrast, and the distribution of the mountains introduces characters of isolation inside with relation to the next seas. Finally, the existence of a large mountain section identifies the mountain climates, with different characteristics depending on the inside or near to the coast character.

From this analysis is extracted, then, a number of general features to understand the climatic differences that exist in Spain, shaping climate zones in which, necessarily, there are a thermal and rainwater gradation from one climate to another. These differences, on the other hand, are necessary to understand the distribution of vegetal landscape, intrinsically linked to the climate.

## **7. CONCLUSIONS**

The apparent complexity of the distribution of climates in Spain should not be an obstacle to transmit some knowledge, such as is the Climatology, of a ordered and clear way. In this work some textbooks have to contribute with scientific rigor, and are prepared by specialist teachers in Geography, specifically for in the last year at secondary school, which does not always happen.

Adapting the curriculum of Climatology at this level, facilitates the geographical learning of the pupils, because Climatology is one of the supports of Physical Geography, and in the same direction, helps to an approach of Geography to the pupils. We advocate, in this sense, by a renewal of the textbooks, in what has to see with the Climatology, and therefore, with the treatment of the climates, to clarify the curriculum. This can be done since, firstly, of climatic concepts, which can be expressed with a geographical sense; secondly for an adaptation of the classifications academic for the last year at secondary school to whom are aimed the textbooks, so that the climates of Spain can be easily understood in general terms and without complex subdivisions; and, thirdly, through some thematic maps that clearly identify the location and extent of the Spanish climatic domains.

