

The Royal Geographical Society The Association of Spanish Geographers

Geography in Spain (1970-1990)

Spanish Contribution to the
27th International Geographical Congress (IGU)

Washington 1992



FUNDACION BBV

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© 1992 Estudio Gráfico Madrid
P.º del Prado, 14, Tel. 429 88 85
28014 Madrid

ISBN: 84-88405-03-0
Depósito legal: B-25.809-92

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Foreword

The 27th International Geography Congress which is to be held in August, 1992 represents an ideal occasion to offer a summary of the work of Spanish geographers over the last twenty years. With this objective in mind the Association of Spanish Geographers and the Royal Geographical Society, through the Spanish Committee of the International Geographical Union, took the decision of publishing a collective work as Spanish Geography's contribution to the Congress.

This work, entitled *Geography in Spain (1970-1990)*, brings together papers written by various authors on different aspects of the institutional organization of Geography and its scientific and intellectual results. Spain has undergone many changes since the 60s: democratic government has been reestablished, after a unique period of transition following the years of dictatorship, a process which aroused the interest of all political analysts; the 1978 Constitution restructured the state in a process of decentralization whereby 17 Communities were formed each with a considerable degree of political and administrative autonomy; in 1986 Spain was admitted as a full member of the European Community with the considerable consequences for production and society which the single market of 1993 entails; in the second half of the 80s, Spain experienced surging economic growth, aided by the favourable international climate. These changes have contributed to major upheavals in earlier territorial patterns and in turn in the expression of geographical information. Spanish geographers have not been able to remain indifferent to this in undertaking their research, and so a large part of their work is a reflection of these changes and the new reality.

Geographers have also been influenced by changes in the academic, scientific and professional conditions under which they have worked in the last two decades. The Spanish University, where most of the research and professional work of geographers continues to be carried out (in spite of the opening and expansion of other centres), has undergone unprecedented growth, as much in number of students as in centres. In this period Geography departments have been created in nearly all the Universities with the consequent increase in the number of lecturers and graduate geographers, as well as the publication of journals by these departments. At the same time, the teaching of geography at all levels has undergone radical changes, some of which have not always been for the better. Also, a national research policy has been put into effect, the priorities of which are decidedly orientated towards scientific and technical fields; though, indirectly they have produced the general effect of uniting forces collaborating on research programmes and lines of research. In recent years there has been a more general acceptance than previously existed for collaboration with foreign edu-

cation and research centres, particularly in Europe and North America, and a greater participation by Spanish geographers at international meetings. This has given rise to a degree of reorientation in geographical concerns which in turn is reflected in the results.

There also exists a greater enthusiasm to work collectively. In addition to the Royal Geographical Society and the Catalan and Basque Geographical Societies, the Spanish Association of Geographers was founded in 1975 in representation of the whole State. This has given support for scientific interchange and specialization as well as encouraging a large number of Working Groups and is tireless in its efforts to ensure that the professional work of Spanish geographers also obtains institutional recognition.

The time is therefore right to take stock of the situation, although it may be that in some fields or with regard to certain issues the proper perspective has yet to be achieved. Thus, the Association of Spanish Geographers and the Royal Geographical Society, through, as we have said, the Spanish Committee of the IGU, decided to seek the collaboration of a number of authors who could present the state of Spanish geography in three main sections: the academic and professional organization and the role played by geographical Institutions; basic research in the major traditional branches in which in earlier research periods the work carried out had in most cases been exemplary; and, finally, some of the new research perspectives of recent years, in accordance with new trends, new techniques or renewed concerns, as well as approaches which seek to integrate the distinct branches of Geography. In this way the work attempts to emphasize both the continuity in research topics and geographical ways of reasoning, in particular with several of the great masters of earlier times to whom present-day Spanish Geography owes a great deal of what it is today, and innovations of all kinds which have been introduced.

The editors have been responsible for coordinating this volume. As in all collective projects (at least in all similar works known to the editors) the finished product does not entirely correspond with the initial plan and unfortunately some contributions, albeit very few, which we would have wished to include are missing. But it is our belief that the present work achieves what we set out to achieve and offers a reasonably accurate and complete picture of contemporary Spanish Geography.

The authors were required to summarize in a few, inevitably brief, pages the scientific production of their distinct fields and branches. The aim was to offer a clear picture of the research carried out since 1970, of the authors and working groups which had undertaken the work, of the circumstances and means under and with which it was produced, of the perspectives which were taken and of the geographical reasoning and arguments which were used. The text together with a complementary bibliography was supposed to inform and guide both the expert reader of our Geography as well as those with little knowledge of it. Certain fields have required, either because of their complexity or regional or thematic diversity, the collaboration of several authors, with one of them, in some cases, acting as coordinator.

That some authors have wandered a little from the straight and narrow path marked out by these guidelines, which is always justifiable from an intellectual

point of view, does not detract, we believe, from the overall coherence and unity of the work. Seldom do intellectual questions come out winning under an imposition of excessively homogenous rules. The editors wish to express their grateful thanks to all the authors for both their work and their generosity and for the comprehension which they have shown towards some of these suggested limitations.

This work has been published both in its original Spanish edition as well as in an English translation. We strongly believe that in this way the work will gain a wider audience and that this will contribute to making the dialogue between the Spanish geographers and their colleagues from other countries more intense and this can only be for the good of Geography.

Finally, we must express our deepest and most sincere thanks to the Foundation Banco Bilbao Vizcaya whose understanding and support have made the publishing of this book possible. Spanish geographers have contracted a debt of gratitude with this Institution which we hope we can go some way to repaying with the quality of our work.

Montesquieu claimed that it is an admirable principle not to speak of things until they have been done. To date Spanish Geography as a whole has only been spoken of occasionally and then in very limited circles; but we hope that, in so far as it is considered worthy, this book will help to make the work of Spanish geographers more widely known.

The Editors

PART ONE

THE ORGANIZATION
OF ACADEMIC A PROFESSIONAL
GEOGRAPHY.
THE GEOGRAPHICAL INSTITUTIONS

1. GEOGRAPHICAL EDUCATION

1.1. GEOGRAPHY TEACHING IN SPANISH UNIVERSITIES

A. LÓPEZ-ONTIVEROS

An examination of this subject entails a certain risk at a time when we are in the middle of reorganizing the system of awarding degrees; it is the most important reorganization since the nineteenth century, as it will mean not a partial adjustment, but a change of model.

However, except for occasional references, our study does not go back beyond the Civil War. The background to the present situation is to be found in developments since then; and clearly it is the present situation that concerns us mainly here.

CURRICULA AND RECENT EXPANSION IN SPANISH UNIVERSITIES.

As is the case in other European states, the roots of the Spanish university system are to be found in the Middle Ages. The University of Salamanca was founded in 1218, and Valladolid in 1346. During this era, and during the Renaissance, *Siglo de Oro* and the Enlightenment, Spanish universities developed as public institutions; they were thus created, accredited, encouraged and organized by Royal authority. This characteristic has lasted until the present day.

More recently, in the nineteenth and twentieth centuries, three legal landmarks of great importance have shaped the course of the universities. These were the *Ley Moyano* (the Public Instruction Act) of 1857, the Spanish University Development Act of 1943, and the General Education Act of 1970 (14/1970). Although naturally universities had their individual features, one can point out certain characteristics which applied to all Spanish universities over this long period:

a) there was stability and little expansion in terms of numbers of universities. Most were either medieval or modern in origin - the Central University in Madrid, Barcelona, Granada, La Laguna, Oviedo, Salamanca, Santiago, Seville, Valencia, Valladolid and Zaragoza - with the exception of Murcia, founded in 1915. This also meant that there was little growth in student numbers. They were

all public universities, except for two private Jesuit universities, Deusto, founded in 1886, and Comillas in 1935.

b) there was a high degree of centralization, a vertical bureaucratic structure, and a total absence of autonomy. Universities depended economically and academically on the Ministry of Education.

c) as a result, curricula were absolutely uniform, both in terms of the length of courses and in the subjects taught. Degrees or national diplomas were validated, not by the university that awarded them but by the State Government. The Government turned them into either automatic passports to jobs in the Civil Service or a kind of public authorization to practise traditional professions such as medicine, law or engineering, among others. (International Council for Educational Development, 1987). With this system, obviously, the subject of geography gave no official title.

Ortega y Gasset's well-known work *Misión de la Universidad* (the University's mission) was published in 1939. Significantly, the origin of the book was a lecture entitled *Sobre reforma universitaria* (On University Reform); in the book he criticizes this bureaucratic and «professionalized» system (Ortega y Gasset, 1955). More recently, the International Council for Educational Development summarized and criticized what it calls the «Napoleonic model» in the following way:

In the old system, the power of decision over all university matters, both academic and organizational or managerial, was monopolized by the Central Government. Decisions were taken by the Ministry of Education and Science in Madrid. The only exception of any importance was a kind of subtle autocratic power exercised by a handful of professors who governed the university faculties as if they were dukedoms. In principle all the universities were equal. All the teaching centres followed the same curriculum, prepared down to the last detail by the Ministry. All the universities awarded the same «national degrees» approved and validated by the Government. These degrees were passports to positions of authority in the Civil Service, in the traditional professions, in the educational system and in politics. The teachers were Civil Servants, selected, appointed and paid by the Ministry; there was a uniform salary structure. The Ministry drew up the budget for each university and kept watch over the internal expenditure, in accordance with a common formula. At best, research projects were awarded only small quantities, as universities were considered to be teaching institutions in which research was of little or no importance. University Rectors were seldom more than representative figureheads with practically no say in decisions about academic or managerial aspects of the institutions that they presided. The real Rector was the Minister. (International Council 1987, 43)

From 1970 onwards Spanish universities underwent considerable changes, the most important being the following:

1. The number of students shot up: from 166,797 in 1960-61, to 329,149 in 1970-71, to over a million in 1988-89. The increase was not gradual, as in other European countries, but very sudden. This was due to the demographic and economic situation of Spain, and also to changes in social stratification (access of women, and of mature students to the university). (International Council, 1987).

2. By 1989, the number of universities had increased from the dozen historic universities to 39. There were now 998 centres, 281 faculties, 27 university colleges, 74 UNED associated centres, 52 senior technical colleges, and 144 university schools. It is not possible to make a breakdown of the situation of Spanish universities; nonetheless, we should mention some of their key features. On the one hand, universities and centres are widely dispersed, in keeping with the practically federal structure of the Spanish state. Although university services are available throughout the whole of the territory, the result of this is that the university network may also be fragmented to an absurd and inefficient degree. On the other hand, there is a concentration of resources in Madrid and Barcelona and the few other universities founded before the Civil War.

3. As a result, and due to the advances of science and the fragmentation of disciplines, new faculties were created and existing faculties were divided. In particular, the Faculty of Philosophy and Arts was divided into Philosophy and Education Sciences, Philology and Geography and History. As we will see, this division had a marked effect on the development of our discipline, geography.

In spite of the intentions of the General Education Act of 1970, the rampant growth of Spanish universities soon became chaotic. The *Ley de Reforma Universitaria* (University Reform Act, or L.R.U.), passed in 1983, was designed to remedy this. The key of the system that it imposed was university autonomy, recognized in Article 27 of the Constitution, described in depth in Articles 1 and 3 of the L.R.U., and upheld by two Constitutional Tribunal rulings. This university autonomy, more a fundamental right than an «institutional guarantee», has two sides: it means freedom of teaching, research and study for university students, and it also means that institutions have the power of self-regulation (Leguina Villa, 1989). The structure and content of university degree courses and curricula are undergoing thorough modification. We are now fully involved in a process which will multiply the number of degree courses, make curricula more modular and flexible, and, we believe, more in line with those currently in operation in Europe.

GEOGRAPHY IN SPANISH UNIVERSITIES FROM 1940 UNTIL THE 1973 CURRICULUM.

After this general outline of the evolution, structure and special problems of Spanish universities, we will now move on to examine recent developments in the specific case of geography. We will concentrate on three periods: the post-Civil War period, from 1940 onwards; the period after the 1973 Curriculum; and the recent period, in which the discipline has expanded fully. We will finish with a study of the creation of and proposals for curricula to come, and their current situation.

After the Civil War, according to Capel's study (Capel, 1976), geography was not only retained as a subject in secondary schools and centres of higher education (in business schools and teacher training colleges) but also in university faculties (there was a Professorship of Geography in Philosophy and Arts Faculties and a Professorship of Physical Geography in Science Faculties). In the area of research, the Juan Sebastián Elcano Institute was set up in 1940, with its delegate sections. In this year the Centre for Applied Geography, dependent on

the CSIC in Zaragoza, and the Institute for Studies of the Pyrenees were also set up. As Franco's régime considered geography as a «vehicle for nationalist ideologies» and an instrument for propagating the «unity of the fatherland», «geography was soon assigned an important role» (Capel); certainly geography was considered more important than other social sciences (Capel, 1976). In my opinion, however, the privileged status of geography after the Civil War should not be exaggerated; many declarations of the time were merely rhetorical in nature and geography still did not award a national degree, which is what really established the courses taught at universities. Continuing the nineteenth century tradition, geography «epistemologically had not only failed to cut its umbilical cord with history, but territory was still considered the 'theatre' of events, and geography as the «daughter» of history» (López Ontiveros, 1986, 4).

In the 1944 Plan, during the five-year course in the Philosophy and Arts degree there were only three geographical subjects: «General Geography», «Geography of Spain and of the Hispanic Peoples» and «Descriptive Geography of the World». Until 1955, when the University of Zaragoza instituted specializations in an experimental curriculum, there were no specialized courses in geography in Spanish universities; the first such plans in the University of Barcelona were in 1968.

In the meantime geographical research continued in the work of the institutes mentioned above and in the journals *Estudios Geográficos* of 1940, which replaced the *Boletín de la Sociedad Geográfica de Madrid*, *Pirineos*, 1944, *Geographica*, 1954, *Cuadernos de Geografía*, 1964, *Revista de Geografía*, 1967, *Papeles de la Universidad de Murcia*, 1968, *Cuadernos de Geografía*, Granada (later *Cuadernos Geográficos*) 1971 (Capel, 1976).

On the eve of the large-scale restructuring of the Curriculum of 1973, geography in Spain was one of the more modest disciplines at the level both of teaching and research: «its level has not yet reached that of other national schools of greater tradition». Although the influences of German, English, American and Portuguese geography are clear, the predominant ideas came from the French school «both from the point of view of the overall conception of the discipline and as far as working methods and techniques were concerned». This resulted in the «wide acceptance of the conception of geography as a science of synthesis and the importance given to local and regional studies», in spite of the great influence of history, the use of methods of an empirical and deductive nature, and the poverty of theoretical reflection. Geography was essentially academic and teaching-oriented, professional geographers being few and far between in private businesses, the administration and planning (Capel, 1976).

On the whole, Capel is very critical of this situation. With the benefit of hindsight, my appraisal is less harsh. The departmental structure of the times and the problem of the teaching staff, which Capel examines at length, should not occupy us, since they were by no means exclusive to geography; on the contrary, they were the manifestation of the chaotic situation, both academically and politically, of Spanish universities. In among the general atmosphere of apathy there was a clear desire for excellence and critical reflection on the part of the young geographers, and a group of teachers created Spanish geography as it is today by their hard work. Among them we should mention the names of Terán, Casas Torres and Solé Sabaris in the first generation, and their pupils López Gómez, García Fernández, Floristán, Vilá, Cabo, Bosque, Rosselló and Quirós.

SPANISH GEOGRAPHY IN THE 80's.

As a consequence of the spectacular growth of Spanish universities and the undertakings of the 1970 General Education Act, university geography in Spain was affected deeply by two structural modifications. Firstly, faculties of Geography and History were created, in which geography became a section, together with the sections of Art, History or the History of America; secondly, from 1973 onwards in most universities a curriculum was implemented based on a *Diplomatura* (Part One) course of three years, common to all sections, a *Licenciatura* (Part Two) course of two years with specific geographical subjects, and Doctorate studies.

This new situation, along with the growth of Spanish universities in general had two key effects: the growth of geography, and, for the first time in Spain the recognition, albeit not total, of a degree in the subject; it is this degree that confers distinction and efficacy in the world of Spanish studies. We can verify a great deal of this by reading an article by Bosque (BOSQUE, 1981) in which he deals with these themes with data that refer to 1980. He estimates that in Spain in 1979-80 there were some 1,500 students in the Geography specialization; 400 finished the *Licenciatura* (Part Two) course, and 12,000 were studying the *Diplomatura* (Part One) course. There were 268 university teachers of Geography.

The new curricula were quite varied but included in the *Diplomatura* «General Geography» (in some cases divided into «Physical Geography» and «Human Geography») «Geography of Spain» and «Descriptive Geography» as compulsory subjects; in a few cases there were also optional subjects. At the level of specialization, as we said, all the subjects are of a geographical nature, and although some are compulsory and others are optional, they can be classified in four groups in terms of their content: informative, conceptual - theoretical or epistemological - didactic and instrumental, or techniques for research or teaching. According to Bosque it appears that in terms of subjects the curricula implemented in a fairly subjective way could be classified as follows: a) in Castile and Leon, the plans were strictly traditional, and informative and compulsory subjects predominated; b) in Catalonia there was great receptiveness to new currents, with a large number of optional courses and conceptual, didactic and instrumental disciplines; c) intermediate, though tending towards the first; d) intermediate, though tending towards the Catalan model.

As for research, the number of geographical journals in circulation grew: in 1980 there were eleven. In the content and articles of these journals there was an almost total predominance of studies of a local or regional nature until 1971; from 1971 to 1980 the situation changed radically: «studies of a local or regional nature were relegated to a position of secondary importance, and studies of General Geography and, to an extent, of Epistemology and Method took their place». In general terms, this evolution is also perceptible in doctoral theses and in the bibliography used by researchers. Bosque states in relation to this and in relation to the structure of the curricula that one can deduce «in a broad sense, the influence of the French school ... on Spanish geographical research. In contrast, the importance of Anglo-Saxon and Germanic lines of research is as yet very limited».

This author's conclusions are of great interest to us a guide to this period:

«In a short period of time, scientific Geography in Spain has reached significant levels of development.... (both) in terms of the number of teachers, and in the number of students and graduates.... none of the sciences that could be considered to be immediate rivals - Sociology, Ethnology, Anthropology - have reached the same levels. Nonetheless, if we look at its content, its objectives and its concerns, we see that Spanish Geography does not seem to have reached a level comparable with that of the same science in France, the Anglo-Saxon countries, Italy or Germany. Its attachment to certain guidelines which some consider very traditional may be a basic reason for this. The privileged attention given to teacher training, and the neglect - sometimes more apparent than real - of other professional activities not related to teaching, are also essential factors. The result of this is the general sensation of dissatisfaction and crisis that now exists among the Spanish geographical community» (Bosque, 1981, p.199)

In my opinion, the growth of the discipline in those years depended totally on two external factors: the spectacular growth of Spanish universities, which naturally affected Geography, and the recognition of a specialization of Geography inside the Geography and History Section; as it was now partially assigned an official degree, it received a seal of recognition, without which it could make no headway in Spanish society. Nonetheless, the reasons for this growth require a more thorough analysis.

ANALYSIS OF THE RECENT EXPANSION OF SPANISH GEOGRAPHY.

By 1986 there had been little change. However, a special of the Bulletin of the Association of Spanish Geographers, published on the occasion of the Regional Conference of the I.G.U. held in Spain, contributed greatly to the data on Spanish Geography. This publication contained information about the Departments that existed, their preferred lines of research and their structure, geographical journals, subjects in all the curricula and a synthesis - by Departments as well - of all this information. It is a great source, a more or less faithful description of the state of Spanish Geography in 1986, and to a certain extent of its state today. Although we cannot examine it in every detail, we can give a general account of what it says. (A.G.E., 1986).

Geography is a discipline taught in all Spanish universities, and in most of them (there are five exceptions) it is a section in its own right inside the specialization of Geography and History. It is also studied in two Research Institutes, the «Juan Sebastián Elcano» and the Institute of Applied Geography, under the umbrella of the *Consejo Superior de Investigaciones Científicas* (Higher Council for Scientific Research, C.S.I.C.), the most important research organization in the country.

In each university Geography, inside the Faculties of Philosophy and Arts or the Faculty of Geography and History, is organized in Departments. There are 38 departments in all; in the larger universities, given their size, there are several departments.

Hundreds of doctoral theses have been presented since 1970, and thousands of students have graduated. 23 geographical journals are published in Spain; this total suggests dispersion but shows the vitality of geography that we mentioned

before. It bears witness to the lines of research of the Departments and all the specializations that exist in the subject.

Furthermore, the practice of geography has expanded outside the academic world and penetrated organizations - both national, and those that correspond to the autonomous regions - of territorial planning and administration in which the profession is exercised.

It is clear that the growth of Spanish geography is closely linked to, and contemporary with, three things: the growth of the discipline on a world-wide scale, the economic growth of Spain, and the opening of Spanish universities to large numbers. In this way we could claim that to a great extent it has been due to external factors. Perhaps, as the starting point was very low, this growth has been relatively greater than in other countries and greater than that of other disciplines with which it has lived in close contact in Spain. We should mention other factors of importance in the Spanish geographical boom: the need for spatial understanding and analysis of a territory like Spain which has undergone brutal changes as a result of the growth of the economy and of tourism, among other things: the process of organization of the autonomous regions in Spain, which has uprooted the political and administrative structures of 1833; the didactic force of geography, compared with other more bookish, less attractive disciplines; the epistemological concern of the geographer, less evident and convulsive in more traditional, stable subjects.

However, although no one can deny this growth, it is also true that few Spanish geographers contest the fact that this process suffers from many limitations and disproportions, because the growth has been irregular and incoherent. In the centrifugal process, although necessary and enriching, there is a risk of provincialisms and autonomism at any price. In general, Spanish geography has lived without external contacts, without integration in the international geographical institutions (especially, the I.G.U.). Due to lack of coordination and isolation, there may have been - and there may still be today - a waste of scientific resources both in terms of infrastructure and intellectual production. The growth of Geography within the university has not been accompanied by growth at other educational levels (in primary and secondary schools). For this reason there are hardly any teaching jobs available; like other areas, these jobs are in danger due to the general economic crisis.

Like so many other areas of life in Spain, Geography has grown enormously over recent decades. This is undeniably an achievement, even though there are occasional traces - inevitably, perhaps - of a certain «disorder and incoherence» (López Ontiveros, 1986).

The curricula also reflect this disorder and incoherence in the growth of Geography in Spain. There were neither unified criteria nor even coordination in their creation, and they present very little conceptual and terminological accuracy in their subjects. This is clear from the number of subjects - 86 - which is excessive if we bear in mind that the specialization is a two-year course. These disciplines can be brought together under the following headings:

1. «General Geography» and introductory areas of Geography.
2. «Physical Geography» and «Human Geography» which are widely accepted.

3. «Geography of Spain», either «General» or «Regional», taught almost everywhere, and «Geography of the Region».
4. «Descriptive Geography», only accepted as such by half the universities, symbolically present under other partial denominations; titles such as Geography of the EC or of South America are conspicuous by their absence. This is at variance with the so often mentioned regionalist tradition in Spanish Geography, and as we will see, it is also at variance with the later implementation of «Regional Geographical Analysis».
5. Under «Physical Geography» «Geomorphology» and «Climatology» are taught almost everywhere. «Biogeography» and «Hydrography» are much rarer.
6. Under «Human Geography», «Population Geography», «Agrarian» (the term «rural» is not consolidated yet) «Urban» and «Economic» are widely taught. Not so common is «Industrial Geography» and «Tertiary Geography» is almost non-existent.
7. Instrumental and conceptual subjects can be divided into «Techniques» and those that deal with «Concept, Method, Theory, History and Epistemology of Geography», which frequently appear with different titles and contents, and «Regional Geographical Analysis and «Regional planning», which we only find sporadically.

Our conclusions on the 1973 curricula are slightly different from other opinions described above:

- a) the plans are based on introductory disciplines («General Geography» «Physical Geography» and «Human Geography») «Geography of Spain» and the most consolidated parts of «Human» and «Physical Geography».
- b) they are based to a lesser extent on «Descriptive Geography», on the region in question and on a wide range of instrumental and conceptual subjects.
- c) there is very little representation of «Regional Geographical Analysis» in its theoretical form, or «Applied Geography» or «Regional planning».

GENESIS AND PROPOSALS FOR THE NEW CURRICULA FOR THE NEW GEOGRAPHY DEGREE.

Both the subject of geography in particular and the Spanish university system in general have undergone vertiginous and uneven growth. Nineteenth century characteristics persist in their regulations, structure and curricula, and the reforms during the seventies were only partial. Consequently the panorama of both the university system and geography as a subject seems totally chaotic. An attempt to impose order in keeping with the principles of the new democratic regime established in the 1978 Constitution was made *ex novo*. The provisions of the 1983 University Reform Act are especially interesting for Geography, as far as its areas of knowledge and curricula are concerned.

Areas of knowledge in Geography.

With the object of creating Departments and setting up Commissions for selecting civil service teaching staff «areas of knowledge are understood as fields of

cognizance characterized by the homogeneity of their object of knowledge, a common historical tradition and the existence of communities of researchers at home and abroad». The areas of knowledge in Geography are established as «Regional Geographical Analysis», «Physical Geography» and «Human Geography»¹.

In principle, the simplification and rationality of this solution seem praiseworthy, since university teachers of Geography had been giving courses with titles that had no homogeneity or logic whatever². Nonetheless, the solution adopted is controversial for several reasons. For some people, the only area of knowledge admissible was «Geography» as its premature division contradicts the historical tradition of Geography in Spain as a unit, the tradition that it has always presented; also, it has no precise specializations and is very vulnerable to competition from similar disciplines which may be more vigorous and coherent. This indeed is true in the case of the concession of the research resources to teaching staff in Physical Geography, dominated by geologists. Nevertheless, it seems absurd to set up a degree called «Geography» as if there were only one area of knowledge, or as if in «Chemistry» there were only one type of chemistry, or in «Law» only one type of law.

Although there have been no major objections as far as the areas of «Physical Geography» and «Human Geography» are concerned, there have been problems with «Regional Geographical Analysis». This area aims to revive a traditional part of Spanish geography and lays claim to subject matter that other sciences such as Economics also demand. However it is indeed difficult to mark its boundaries clearly; «Physical Geography» and «Human Geography» can carry out regional analysis and frequently do so. The reverse is also true.

In conclusion we may say that the growth of Geography in Spain was so fast that its cultivators lacked a common and specific historical tradition which would have helped them to claim clearly defined areas of knowledge.

The Group XIV proposal for the Geography curriculum.

The University Reform Act lays down that «the Government ... will establish which degrees are official and valid throughout the country and will also establish the general guidelines of the curricula to be followed in order to obtain and convalidate the degree». (Art. 28).»The universities will elaborate and pass their curricula, in which they will indicate the subjects, both compulsory and optional, which are to be studied in order to obtain the degree». (Art. 29). We should point out, however, that the first phase - Article 28 - is practically complete, and that the second - Article 29 - has hardly begun. As a result, curricula for Geography can only be analyzed in part.

For the elaboration of these plans, the Ministry for Education and Science created «Groups of experts»; geographers were in Group XIV, which also included Philosophy, History, History of Art, Musicology, Documentation and Archives and Religious Sciences. The group proposed the creation of nine Degree courses and two *Diplomaturas*; among the Degree courses there appeared a «Degree in Geography» and a «Degree in History, Geography and History of Art». At the same time, the core subjects proposed for the degree of Geography were:

Primer Ciclo (Part One): «Physical Geography», «Human Geography», «Techniques in Geography», «Geography of Spain», Regional Geographical Analysis», «Geomorphology», and «Urban Geography».

Segundo Ciclo (Part Two): «Climatology», «Rural Geography», «Theory and methods in Geography» «Geography in the EEC».

In the degree «History, Geography and History of Art» there were only three core subjects from Geography: «Physical Geography», «Human Geography», «Geography of Spain». There were a larger number, perhaps excessively so, of History subjects.

As one of the experts in Group XIV, I know all the details behind the proposals; here are some observations with reference to the degree in Geography:

1. The most important point was the creation, for the first time, of a degree in Geography, recognizing the genuine, independent nature of the discipline and its personality within the scientific world. As a result, Geography will develop scientifically and be transmitted through teaching without the support of other sciences. This support was of debatable value, even if the historical reasons behind it were easily explained.

2. The fundamental aims of the degree in «History, Geography and History of Art» were, from our point of view, to ensure that Geography was present in *bachillerato* (Secondary School) teaching, since the degree would train teachers for this area, and to enable geographers to continue teaching Geography in small universities and University Colleges in cases in which the size of the staff did not allow them to teach a specific degree in the discipline. This degree was not accepted by the Ministry for Education and Science; at the moment it seems that it will be substituted by an even more general one, «Humanities» in which there is only one core subject from Geography: «Human Geography».

3. The core subjects for the degree in Geography were proposed as such because they were generally considered to be consolidated, epistemologically basic, and accepted by all the geographers (we may recall what was said about the 1973 curricula). There are innovatory subjects and others which are contemporary in nature, and less defined; it was felt that the universities could include them in the range of compulsory and optional subjects.

In this way, the proposal aims at a certain balance between introductory subjects which belong in the *Diplomatura*, and other «content» subjects which are considered fundamental, and one instrumental subject to guarantee a certain «technical» character in the *Diplomatura*. There is another which allows theoretical and epistemological reflection at the end of the *Licenciatura*. It also aims at a scrupulous balance between subjects assigned to the three areas of knowledge; although their implementation was recent, they had created a series of interests in Spanish Geography which could not be ignored (López Ontiveros, 1987).

The alternative proposals by the universities.

The proposal of Group XIV was then analyzed by the universities, who made 29 alternative proposals and observations, which are worth examining here (Consejo de Universidades, 1988).

Degree. It was accepted unanimously that the *Licenciatura* should be called «Geography». Many felt that there should be a *Primer Ciclo* with a first degree, which would be called, significantly, «Diploma in Geography (Territorial Analysis)» This is the first sign of an approach which stresses the applied character of the curriculum. Nevertheless, the Ministry for Education and Science dismissed this *Diplomatura* unilaterally.

Core subjects and structure of the Degree. The desire for a structure of three years for *Diplomatura* and two years for *Licenciatura* was also practically unanimous; it was suggested that core subjects should be reduced to 30% of the course content, whereas in the previous proposal they had been made up 40%.

Core disciplines: The following were generally accepted:

«Physical Geography», «Human Geography», «Theory and Methods», and «Techniques in Geography» (as such, or under other names). The following did not reach general acceptance as core subjects: «Regional Geographical Analysis», «Geography of Spain», Geography of the EEC», and different parts of Physical Geography and Human Geography («Geomorphology», «Climatology», «Urban Geography», «Rural Geography», and «Population Geography», which did not appear in the Group XIV proposal).

«Regional planning» has made considerable headway, as have other branches of Applied Geography, in line with the current trends in favour of this applied subjects. This conception is clear too in the proposal of the Association of Spanish Geographers, after the study carried out by a Commission, whose conclusions are as follows: *Primer Ciclo* : «Regional Geographical Analysis», «Physical Geography», «Human Geography» and «Techniques in Geography»; *Segundo Ciclo* : «Applied Physical Geography», «Applied Human Geography» «Regional planning», and «Theory of Geography».

In practice, therefore, Spanish geographers want the degree in Geography to have three main bases: a) Introductory subjects in the *Diplomatura* «Regional Geographical Analysis», «Physical Geography», «Human Geography»; b) «Techniques in Geography» and Theory and Methods in Geography»; c) «Regional planning», and «Applied Physical and Human Geography». On the other hand they reject - and this is the great divergence from the Group XIV proposal - different parts of Geography specialized in terms of content, and «Descriptive Geography» and «Geography of Spain» for the core subjects.

The degree in Geography according to its general guidelines.

After diverse alternatives the Royal Decree 1447/1990, of 26 October, established «the University degree of *Licenciado* in Geography, official and valid throughout the country and will also establish the general guidelines of the curricula to be followed in order to obtain and convalidate the degree». We should bear in mind particularly the objectives of the teaching, how the subjects are organized, and the list of core subjects.

As for the objectives, we should note the emphasis that is put on the applied and practical nature of the teaching, which «should provide sufficient scientific training in basic and applied aspects of Geography, analysis and «Regional planning».

As for the organization of the subjects, there are two parts, or cycles, *Primer Ciclo* (Part One) and *Segundo Ciclo* (Part Two), with an overall length of four or five years, each *Ciclo* being at least two years; the teaching load is at least 300 credits, 120 for each *Ciclo*. Besides these two cycles there is the Doctorate cycle, specifically for graduates, which comprises courses and seminars in the Doctorate programme (dealing with methodology and training in research techniques, basic subject matter of the discipline and areas related to the programme). The Doctorate will last at least two years, and the presentation and approval of a Doctoral Thesis consisting of an original research project¹.

Finally, the core subjects laid down for the *Licenciatura* in Geography for the *Primer Ciclo* are «Geography of Spain», «Geography of Europe», «Physical Geography», «Human Geography» and «Techniques in Geography». For the *Segundo Ciclo* they are «Applied Physical Geography», «Applied Human Geography» «Regional planning» and «Theories and Methods of Geography». As can be seen, these core subjects only vary in one aspect from the proposal of the A.G.E. - in my opinion, it is an improvement - «Regional Geographical Analysis» is replaced by «Geography of Spain» and «Geography of Europe». This is a partial concession to the initial proposal of Group XIV. I say «partial» because other «content» disciplines have disappeared from the list of core subjects, and the other applied guidelines of Geography have prevailed; this development will probably direct the study of the discipline along new and unexpected paths. In any case, we will have to wait until the end of 1993 before we see how Geography in Spanish universities develops; this is the deadline for the universities to finish their curricula for the discipline with all its basic and optional subjects.

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1.2. THE NEW CURRICULA AND TEACHING IN SPANISH UNIVERSITIES.

A. HERNANDO

POLITICAL CONTEXT

The democratic period that started in 1975, and the increasing links with liberal Europe are two key factors in the development of Spanish universities today, which present a clear break with the institution and regulations inherited from the past. Since 1982, with the Socialist Party's ascent to power and the passing of the University Reform Act the following year, we have seen a set of regulations and decrees that have tried to shape a new form of university education. This Act is the foundation of a new university system, aiming above all to satisfy the present and future demands of a society and an economy whose links with Western Europe grow stronger every day. It gives a great amount of autonomy to the institution and tries to make its structures flexible enough to adapt to a changing world. There is a notable increase in the number of disciplines that can award degrees; one of these is Geography. The regulations created by this Act affect teaching staff, students and also teaching and learning norms.

One of the most innovative new policies is the concession to the different universities of the right to design their own study plans in an autonomous fashion. In the past, all the universities followed plans laid down by the Administration. We are all aware that the new situation is exceptional and unprecedented.

The political pragmatism behind the new regulations explains the limitations of Humanistic studies. These studies have a long tradition in Mediterranean Europe and it is within this context that Geography has developed until the present. Now attention is given to applied studies and the offer of training and study has diversified; classes devoted to practical activities, and fresh subjects with a clear applied bent, such as Regional Planning have been incorporated.

The geographical community has welcomed all these changes. Its vitality is evident from the provision for courses and activities which aim to improve its image and to raise the level of recognition among the general public, thanks to the incorporation of teaching which until now have been barely associated with Geography. There are, though, certain clouds on the horizon: for example, the low numbers of students in this speciality, due to the lack of knowledge of its possibilities. This is the result of the limited and partially distorted image promoted in secondary education.

THE CURRICULA.

The creation of the degree of Geography («Boletín Oficial del Estado» November 20th, 1990) brought with it a partial design of the teaching involved in the subject. The number of credits - a new name for evaluating learning experiences

or teaching units - required to obtain the degree is 300. They can be attained over a minimum period of four years. To make it easier to convalidate degrees and studies from the different universities, or subjects in the case of students who change university, the Administration proposed a proportion of common credits of 30% for all study plans. The rest depend on the Statutes of each university; the universities are responsible for imposing a larger proportion of compulsory subjects and for allowing students to choose courses in the Geography specialization or in others. For example, the University of Barcelona has made 50% compulsory and 20% optional (to be chosen from any specialization). The remaining 30% must be chosen from the Geography courses offered on an optional basis every year to students, which are theoretical, regional, instrumental or applied subjects.

The subjects laid down by the Administration correspond proportionally to Physical Geography, Human Geography and Regional Geography (Geography of Spain and Geography of Europe). There are others, such as Theory and Methods of Geography, Techniques in Geography and Regional Planning. This set of subjects makes up the core syllabus that universities must offer in order to confer degrees in Geography. To this offer of 108 credits established by the Ministry we should add other subjects of both compulsory and optional nature, which are decided at the level of each individual university. The traditions of research and teaching in each department, the number of members in each department, the specializations of departments and teachers explain the existence of a very varied syllabus within the Spanish context. Subjects of diverse natures - theoretical, thematic, regional, methodological and instrumental (such as Cartography) - and of an applied nature, linked especially to Regional Planning, are the characteristics of modern Geography education; to these we should add other subjects that students choose from outside the Geography curriculum.

Future geographers are required to follow approximately 75 credits annually, 150 in each two-year cycle of their instruction and training. In terms of hours of class, this supposes some 750 hours per year. Roughly half of these classes must be practical in nature. Regulations lay down a minimum of 30% for practical classes; as we mentioned before, for Geography and other Humanities subjects, this is a great novelty. The maximum allowed for theoretical classes is fifteen hours per week; if we multiply this figure by the number of weeks in an academic year (30) we find the theory/practice ratio.

Until now in Spain, there have been no external examinations at the end of the course to standardize criteria and present an academic profile of each university. The legislation does not make provision for them either. Each centre, and not the State of the Ministry of Education - as was the case before - issues the degree in question. The teaching staff of each university determines the nature and depth of knowledge and experience necessary to earn the degree in Geography. We should remember that, due to the pragmatism behind all this legislation, the second study cycle is considered as preparation for professional practice.

Because of the lack of research into teaching and learning in university Geography it is difficult to have a generalized idea of the area or to speak of a dominant university model. However, the programmes for the subjects, their bibliography, and personal contacts are proof enough of a tendency towards an educational model based on the transmission of knowledge, and familiarization

with concepts and ideas of the areas corresponding to the subjects mentioned; study is based on a limited number of authors, and knowledge based on the dogmatism and monopoly of the bibliography available. In recent years, the list of works has grown notably, with translations of English and North American material. Previously authors and works from the French school dominated. In the teaching given, there is little tradition of encouraging applied aspects of the discipline, or of familiarizing future professional geographers with problems and training them to solve them; nor is there much tradition of manipulating instruments used in obtaining, analyzing and presenting data, or of setting students tasks which will make up their professional future. Although study trips are common, field work is not yet compulsory for all Geography students. The tutorial guidance and independent work of students and other teaching and learning procedures are still little in evidence as fundamental ingredients of the study of Geography.

While regional studies used to dominate the educational philosophy of the recent past, the growing thematic specialization of teaching staff has meant that theories from Natural and Social Sciences, with marked empiricist influences within a neopositivist framework, have become widely accepted and followed. Conceptual and methodological tendencies, and others more recent - the modern and post-modern (although their influence is still slight) - are present alongside erudite traditions of an idiographical or historicist nature. If we look at the existing bibliography we will see that research studies are usually carried out on a regional scale, within the area of an Autonomous Community, or on a national scale; there are few international studies. Broadly the same is true of applied studies and projects; although they are larger in size, they do not have the necessary social impact to arouse the interest of the Administration or private spheres of activity.

An attempt is clearly made to offset these limitations in the new study plan. We should stress particularly the fact that «Geography of Europe», a subject with little research tradition, will become a compulsory, core subject. At present it is not to be found in the curricula. We hope that this move will prove to be a stimulus, and that it will enrich the Spanish geographical tradition, which until now has not been present in political debates and decisions on the European scale. The same can be said of the subject Regional Planning.

Despite the synthetic nature of many of the subjects taught, there are as yet few publications in Spanish within the scope of students. A substantial part of the bibliography is made up by foreign works. Although considerable efforts are being made by certain Spanish teachers and publishers, very few works by Spanish writers have been published. Paradoxically, there is a large number of geographical journals, published by the different Spanish universities.

It is not possible to study for the degree in Geography in all Spanish universities. This is due to the low numbers of teaching staff in many of the university departments and also to the explicit desire of the autonomous Administration to regulate the location and the number of universities that offer the degree. Apart from the limitations in human resources, all universities suffer from a lack of teaching resources, with under-equipped lecture halls and classrooms, libraries with few international books and reviews, general unavailability of cartography and aerial photography of diverse nature, and computer hardware and software.

Only the predicted fall in student numbers may make up for the lack of material resources, at least in the universities with large student numbers, such as Madrid and Barcelona.

We do not have at our disposal data on the subject of the quality of teaching, as there has been no research aimed at presenting a profile of modern graduates with their virtues and shortcomings. Recently, most universities have carried out various surveys in order to obtain diagnostic data. The aim of these projects is to improve certain aspects of teaching activity. We imagine that competitiveness and the increasing integration of Spain in Europe will call for an evaluation and appraisal of the efficiency of the teaching, the future occupation of our graduates, reasons for students giving up the courses, and other aspects, in a bid to raise the quality of our teaching.

Apart from the *Licenciatura* studies (the First Degree), many departments offer or participate in Post-graduate studies, leading to the presentation of doctorates. Two academic years, with classes of a very varied nature, depending on the teachers who give them, and the presentation of a written research project, are the requirements for students who wish to round off their academic careers. Other post-graduate studies, more related to the necessities of society, are as yet few in number, although there is some participation in post-graduate studies taught in other Faculties, in areas such as urban development, the Environment, Regional Planning or other studies.

A FUTURE OF PROMISE.

Although we should be careful of over-confidence, we can look to the immediate future with optimism. The reform of the universities has offered us the opportunity to train experts in geography - something without precedent in our history and something that has been achieved after numerous previous attempts. The autonomous character of the subject, now freed from its humanistic straitjacket, allows to plan its future development based on the needs of society, with themes and approaches of a markedly applied orientation. The vitality that Geography has shown over the last few years with the proposals for new subjects, the appearance of departments, the interest in developing other areas of research, has borne fruit with the creation of the degree of *Licenciado* in Geography.

At the same time, this invitation to train professionals is a great challenge for the geographical community. Like all novel situations, it poses certain problems. The sensitivity that we show to the labour market, the proposals for training that allow our students to compete with other professionals, and the public image that we project will attract new students who are well informed of what we have to offer. Indeed, student numbers will depend on this offer. The consolidation of Geography as a specialization within the university set-up will cause an increasing recognition of its contribution not only to knowledge and understanding of the society and world around us, but also to its improvement.

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APPENDIX

THE GEOGRAPHY CURRICULUM PASSED

BY THE UNIVERSITY OF BARCELONA

- List of subjects offered in the Geography degree course.
- Compulsory subjects should be taken by all students. They make up 50% of the total of credits required (150 out of 300).
- Optional subjects listed here may vary every two or three years. Most of them are worth six credits (about 60 hours of teaching). It is hoped to fit supply to demand. Optional subjects from the *Primer Ciclo* (Part One) may also be taken during the *Segundo Ciclo* (Part Two).
- In terms of teaching staff, some 800 credits are available.
- There will be two groups for compulsory subjects and one for optional subjects.
- This plan will come into force in October 1992.

COMPULSORY SUBJECTS

Part One

Physical Geography (24)

- Climatology (6)
- Geomorphology (6)
- Soil Geography (3)
- Hydrogeography (3)
- Biogeography (6)

Human Geography (24)

- Human Geography (12)
- Population Geography (6)
- Economic Geography (6)

Introduction to Regional Geographical Analysis (12)

- Introduction to Regional Geographical Analysis (6)
- Geography of Catalonia (6)

Geography of Spain (12)

Geography of Europe (12)

Techniques in Geography (18)

- General Cartography (6)
- Thematic Cartography (6)
- Quantitative Analysis Techniques (I) (6)

Part Two

Applied Physical Geography (12)

- Analytical climatology (6)
- Dynamic geomorphology (3)
- Protected natural spaces (3)

Applied Human Geography (12)

- Urban Geography (9)
- Rural Geography (3)

Regional Planning (12)

Theory and Methods of Geography (12)

- Theory and Methods of Geography (6)
- Theory and Methods of Physical Geography (3)
- Theory and Methods of Human Geography (3)

OPTIONAL SUBJECTS.

Part One

Climates of the Earth.
Synoptic climatology
Climatic geomorphology
Mediterranean erosion
Landscape geography

Social geography
Cultural geography
Political geography
Historical geography

Photo-interpretation and satellite images
Physical/mathematical bases in geography
Quantitative Analysis Techniques (II) (6)
Applied Computing Techniques in geography (I)
Applied Computing Techniques in geography (II)
Qualitative Analysis Techniques
Laboratory Analysis Techniques

Part Two

River geomorphology
Erosion processes
Geomorphology of cold regions
Geoecology of Mediterranean mountains
Littoral geoecology
Hydroedaphological processes

Dynamics of the climate
Microclimatology
Analysis of Meteosat images
Climate and atmospheric contamination
Climatology of the Western Mediterranean

Biogeography (II)
Biogeography of the Iberian peninsula
Biogeography of the Mediterranean

Geography of migrations and human resources
Demography

Territorial conflicts and social movements

Agrarian geography
Rural spaces

Internal space in the city
City and territory

Industrial geography
Geography of the Service Sector

Political geography: case study
Cultural geography: case study

The uses of water in Catalonia
Transport infrastructure in Catalonia
Catalan agriculture
Regional planning in Catalonia
Evolution of Catalan industry
Expansion of tourism in Catalonia

Geography of the Autonomous Communities of Spain
Territorial Divisions in Spain
Socio-economic contrasts between Spanish regions

Regional World Geography
Geography of Africa
Geography of Latin America
Geography of World Agriculture
South Asia

Sources and methods in Historical Geography
Historical Geography of forests

Geographical Information Systems
Cartography project
Toponymy

Research project in geography
Geography field work
Laboratory techniques and analysis (II)

Regional management
Regional Disparities
Analysis and evaluation of environmental impacts
Urban and regional planning

History of geography
History of cartography
History of geomorphology
Educational geography
Educational resources in geography teaching
Teaching practice in geography

for admission to university. At the high school level, there was also a Professional Training Program which ran parallel to BUP and COU; it was divided into two grades. In each one of these stages and levels, the role of geography differed greatly.

GEOGRAPHY IN THE «EDUCACION GENERAL BASICA» (ELEMENTARY SCHOOL)

In the new EGB, geography was eliminated as an independent subject. It fell into the domain of social sciences where it was combined with history and civics.

The *Ley General de Educación* (General Law of Education) decided that in the *Ciclo Inicial* (lower school), students, age seven and eight, would begin to come into contact with their immediate physical and social environment; in the following three years, they would begin studying their local surroundings, communities, regions, and Spain, with a global perspective which would include a familiarization of the most basic geographic characteristics of each of these areas. However, it is in the *Ciclo Medio* (middle school), with students age twelve, thirteen, and fourteen, that geography would acquire a greater role. In the first two years of this stage, sixth and seventh grades, specific geography units would already be fully integrated into the curriculum although these remained under the course heading of Social Sciences. In this way, the sixth grade curriculum included notions of general geography, both physical and human, and some units on the geography of Spain, along with a historical backdrop on Spanish and European society, and civic issues. The seventh grade curriculum consisted of the study of the continents, with a regional focus, coupled with history and civics.

In reality, in this phase Social Sciences never really integrated History, Geography, and other Social Sciences, in a coherent way. Rather, the curriculum juxtaposed thematic units from each one of these disciplines. As Martínez Varcárcel has pointed out, Geography had the secondary role of presenting a backdrop against which social and historical events transpired (Souto, 1990).

GEOGRAPHY IN THE «ENSEÑANZAS MEDIAS» (HIGH SCHOOL)

In the new high school system, comprised of BUP and Professional Training Programs, Geography played a small role. In the latter, the curriculum did not even include geography. In the *Bachillerato* or BUP (high school), the presence of geography was limited to one subject. It was called «Human Geography and the Economy in the Current World» in the first year, and «Geography and History of Spain and Hispanic Nations» in the second year. This course entailed studying general characteristics, both physical and human, of the geography of Spain, combined with history of the same and of Iberoamerica. In COU, there was also a subject called Economic Geography, but it was eliminated early on.

The course «Human Geography and the Economy of the Current World» consisted of two different parts. The first entailed an analysis of the population and its major economic activities. Instead of following the old methodology of Economic Geography, based on extensive cataloguing that located economic activity and was accompanied by much statistical data, an attempt was made

1.3. THE GEOGRAPHY IN PRIMARY AND SECONDARY EDUCATION

J. CRESPO-REDONDO
E. FERNÁNDEZ DE DIEGO

In the more than half a century that has passed since the end of the Spanish Civil War, seven school programs have transpired, each with its own way of organizing primary and secondary education. These have followed the political, economic, and social evolution of the country. Geography was never excluded in these programs, but the importance assigned to our subject, its scientific basis, and the educational goals aspired, have differed greatly from one program to the next. In general, throughout this period, geography has played a small and diminishing role. The purpose of this paper is to analyze the treatment of our discipline in both the educational system that prevails and the one that will come gradually into effect as of the scholastic year 1991-92. The former derives from the *Ley General de Educación* (General Law of Education) of 1970, and the latter was established in the *Ley Orgánica de Ordenación General del Sistema Educativo* (Organic Law for the General Organization of the Education System) enacted in 1990.

THE «LEY GENERAL DE EDUCACION» and GEOGRAPHY

The authoritarian educational system that was imposed by the winning forces of the Civil War was closely tied to the totalitarian political regime and to its autarchic economy. However, this system came into crisis around 1960. Thereafter, Spain significantly developed economically; it became an industrialized nation thanks to the technocratic policies that were adopted. Spanish society also changed noticeably: extensive rural areas in the interior of the country were abandoned, the cities grew, the traditional rural family disappeared, the industrial proletariat increased, and the middle classes expanded. With technocratic and modernizing policies, the newly emerging Spain needed an educational system that would be less elitist and less geared towards the minority. The process of industrialization and the growth of the service sector necessitated a better trained labor force: workers with higher degrees, more high school graduates, and graduates with professional training. Thus, there was a need to expand education at all levels and to modernize the education system as a whole, both in terms of curriculum and methodology (Arroyo, 1990; Crespo Redondo, 1983).

The *Ley General de Educación* (General Law of Education) of 1970 attempted to answer all of these needs. It entailed not only a new curriculum, but also the complete revision of the school system. The previous primary education became the *Enseñanza General Básica*, EGB, and was extended to age fourteen; it was mandatory and free of cost for all Spaniards. The new high school, «unified and polyvalent», known as BUP, was consequently reduced to three years. The *Curso Preuniversitario* or COU (Pre-University Year) was required

towards a more human and cultural focus; as a novelty, the course included the study of the geographic areas that corresponded to each economic activity. The second part of the course consisted in having the students apply the knowledge acquired from the first section by studying certain imagined states as economic spaces. In our opinion, this approach has been unjustly criticized of following the tenets of traditional Regional Geography (Hernando, 1981; Souto, 1990). There is nothing in this curriculum that recalls Vidal's concept of regional space as a unique and singular entity; furthermore, in this program, students neither study regions nor landscape. Instead, they study the geographic characteristics of a few countries which «as models», represent «various types of economic systems and degrees of development» (González and Martín Moreno, 1989). Evidently, this is an approach which is not related to that of Regional Geography.

As stated above, in the third year, students take a multitudinous course entitled «Geography and History of Spain and Hispanic Nations». In actuality, the course only manages to present the geography and history of Spain. The curriculum begins with the physical traits of Spain and continues with a historical overview from pre-historic times to the present. It includes some geography units of a socio-economic nature on contemporary Spain. The decision to combine geography and history was not based on any ideological concept intended to explain Spain with geo-historical criteria, nor on any conscious and explicit Determinist calculation, and much less on any didactic pretensions to interdisciplinary education. In reality, the ministerial authorities decided that there was not enough room for both subjects separately in the curriculum, and so, they opted for combining them (González and Martín Moreno, 1989). Nevertheless, it is true that in the distribution of subjects, geography was given an auxiliary role with respect to history; it was meant simply to describe the physical environment and in this way, set the stage for historical material.

THE CRISIS OF THE «LEY GENERAL DE EDUCACION» (GENERAL LAW OF EDUCATION). GEOGRAPHY IN THE L.O.G.S.E.

The state of geography in the new curriculum established by the *Ley General de Educación* (General Law of Education) was immediately criticized. Some teachers complained of the absence of Physical Geography, the mix of Spanish geography and history, the inappropriateness of the material for the age group of the students, the insufficient time allotted in the school schedule. Parting from a different viewpoint, others denounced the encyclopedic and overly academic nature that, in their opinion, geography had been assigned in both EGB and BUP. This group wanted to integrate geography into a section of social sciences that would also encompass some areas of sociology and economy. In part, the curriculum they proposed would be determined by the interests of the students themselves. Their program would respond to the idea of a practical education that would serve one's life in the future. The role of geography in education was being debated in such a way that its place was determined not according to its scientific foundation, but rather on the basis of its educational capacity. Thus, a strong inclination for the elimination of the so-called academic geography and the introduction of a scholastic geography in its place arose among groups of high school and above all middle school teachers. The new kind of geography would be inscribed into the subjects of social

sciences. It would be especially oriented to the study of one's environment (Crespo Redondo y Rodríguez Santillana, 1989). This tendency first developed in the catalan institution Rosa Sensat, and later spread to other movements of pedagogic reforms that disseminated it throughout the country in the early 1980s.

On the other hand, at the time of Franco's death, it was already becoming clear that it was necessary to substitute the technocratic education system of 1970. A program that would respond to the new socio-economic situation and especially to the new constitutional values was urgently needed. The government of U.C.D. began to plan an education reform which they never finished. In 1983, the first socialist government initiated an experimental reform that affected geography in a sensible way (González Muñoz, 1989).

Currently, the reform of the education system is normatively almost complete. The L.O.G.S.E., enacted in 1990, will come into effect gradually. Among other stages and levels, the law provides for Elementary Education between six and twelve years of age, Mandatory Secondary Education, between twelve and sixteen years, and High School as of the age of sixteen, lasting two years. In each stage, geography will play a different role. The Ministry of Education and the Autonomous Communities have still to specify all the legal provisions of the new law. Thus, it is still not possible to know to what extent nor what kind of geography will be included at each stage. However, we do know enough to appreciate the new role of geography in Mandatory Secondary Education.

GEOGRAPHY IN THE NEW MANDATORY SECONDARY EDUCATION

Under this heading, we will investigate the degree to which our discipline is integrated into the domain of the social sciences in the new curriculum. In addition, we will note the geography topics selected for the curriculum, and analyze whether these are well chosen and formulated. Finally, we will evaluate the kind of geography education that can be attained with this new program (Crespo Redondo and Rodríguez Santillana, 1991).

1. Does the law dispose for geography to be taught as a separate discipline?

As was to be expected, considering the documents up for public discussion, the L.O.G.S.E. and the minimal requirements of the Decree established one area of study under the multi-referential denomination of Social Sciences, Geography, and History. Within this category, the preeminence of History and Geography is explicitly noted because of «its greater academic and cultural tradition...»; and in the secondary level (14-16 years old), its «division into units» is accepted, (article 20).

Thus the legal clause cited above assigns a single area of study for the Social Sciences, Geography, and History. Furthermore, it allows teachers to organize the course in different ways that may vary between the most pure division into subject units to a program that completely integrates the different disciplines.

2. How many and which are the geographic topics in this category of the curriculum?

The role assigned to geography within the area of Social Sciences is very different in each of the three main aspects of the curriculum. Its importance is somewhat small as far as general goals are concerned, but it is greater in terms of subject matter and also more relevant with regard to evaluation criteria.

Goals: The presence of geography within the general goals of the area of Social Sciences is small. In fact, there is only one goal, number four, among the eleven listed, that can be characterized as specifically relevant to geography.

Subject Matter: With respect to subject matter, the minimal requirements of the Decree assign significant importance to geography. Among its four thematic divisions, the entire first one, entitled Society and Territory, and part of the third, The Current World, are dedicated to various geography topics such as concepts and theoretical principles, methods for analyzing situations and the development of attitudes.

Among the first group of topics, the traditional geography concepts, which have always been incorporated to scholastic programs, predominate. Some of these are physical environment, population, economic activities, geographic spaces, the urban phenomenon, the global economic unevenness, development and underdevelopment. There is, however, a novelty that should be noted: the inclusion of issues pertaining to Political Geography, fashionable long ago in universities, and only now introduced to secondary education. The geography of Spain lacks its own unit, but according to the Decree, every and each aspect of general geography that is noted above, also has to be studied with respect to Spain. In addition, some typical topics of Environmental Education are incorporated into the curriculum. The inclusion of methods and procedures for analyzing cases, which is also a novelty, is highly significant. Among these, we should mention the use of information resources, graphic representation, cartography, and the initiation into field work.

Criteria for evaluations: The importance that the Decree concedes to geography in terms of the criteria it determines for education evaluation is also considerable: of the twenty nine criteria listed, nine are completely relevant to geography. Their breakdown faithfully follows the units in the section Society and Territory. In most cases what is to be evaluated is the ability to identify, characterize, and locate the principle concepts of geography in the world and in Spain. Other times, evaluations expect students to understand more complex matters, such as some spatial concepts or the environmental impact of human activity.

3. Are the geography units well chosen and correctly formulated?

The geography units in the curriculum are not always well chosen nor, in our opinion, are the topics correctly formulated from a scientific point of view. Basic concepts such as mediums, space, territory, and landscape are sometimes used correctly, but other times used arbitrarily or at least with certain inaccuracy and ambiguity.

Even the concept of geographic space, which is fundamental regardless of the geographic perspective one may take (traditional, quantitative, radical, or behavioral) is treated with obvious theoretical carelessness; in general, the idea of geographic space that seems to predominate is that it is an empty entity which acts as the local for certain social phenomena.

Another issue which should be analyzed is the degree of novelty in the subject matter selected. Perhaps some professors believe that the selection was made on the basis of overly traditional criteria. Indeed, the curriculum has not really adopted new trends in the discipline. Nevertheless, some new focuses at the secondary education level are not altogether absent. For example, the curriculum concedes a notable role to Political Geography and to geographic methods; there is a specific unit for each one of these topics. On the other hand, the more traditional trends in our discipline are not included, to the extent that there is not a single reference to the old descriptive geography.

The selection of geography units in the curriculum seems to have been made with prudence and a certain eclectic spirit—perhaps a bit timorous. It is indeed a sign of prudence that of the nine trends in the discipline, none was imposed above the others, thus, allowing teachers to develop their course according to their own opinions. The eclectic spirit is evident in the addition of some new subjects to the traditional topics, tied to a concept of geography as a science principally concerned with the analysis of the relationship between nature and society.

4. What kind of geography education can be achieved with this curriculum?

We believe that there is only one real geography education, one which is attained when the teaching of geography is not limited to its general educational aims. Ultimately, it is desirable to arouse the ambition to reach an understanding of all that is inherent to the discipline of geography, which can be summarized as the formation of a spatial consciousness in all citizens. The education of geography is to supply the student with conceptual tools and methods by which to analyze and act in space, and to recognize and explain its structures. In the end, it is about seeing the world from a geographic lense, understanding space and knowing how to live in it.

The issue which is of interest to us now is to what extent is this type of geography education, that we clearly advocate above, feasible in the new secondary school program. As we see it, thus far, the legal proceedings have neglected to take full advantage of the many educational virtues inherent in geography; furthermore, they have looked upon geography as an instrument exclusively at the service of reaching general educational goals. In conclusion, neither the L.O.G.S.E. nor the minimal requirements of the Decree explicitly establish a geography education per se; this is clear from the small role assigned to geography in the goals stated for the area of Social Sciences. Among those objectives, only the fourth fully relates to geography, stating that it can contribute to the development of the student and his or her ability to «identify and analyze at different levels the interactions that human society establishes with its surroundings, both in the use of space and of natural resources»; and it can also teach «to appreciate the economic, social, political, and environmental result of these interactions». There are two other goals which relate to geography although they are not exclusive to our discipline. The first is of an instrumental nature since it emphasizes as a goal the use of different types of information, among which cartography is mentioned. The second relates to acquiring positive attitudes such as the appreciation of the environment and one's surroundings. In none of the other goals, which total eleven, is geography assigned an explicit role.

In effect, the Decree deals with geography in a somewhat incoherent way. On the one hand, it assigns considerable importance to our subject with respect to topics

and criteria for evaluation, but on the other, it underestimates its contribution at the level of reaching educational goals. It seems that in general the educational goals are ascribed to the social sciences, and more specifically to sociology and political science, while in subject matter, leaving ethics aside, geography and history are emphasized more. It is unfortunate that the authors of the new school program did not take advantage of the educational possibilities of geography.

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2. GEOGRAPHICAL RESEARCH IN THE CONSEJO SUPERIOR DE INVESTIGACIONES CIENTIFICAS (HIGH COUNCIL FOR SCIENTIFIC RESEARCH)

M.A. MARTÍN-LOU

Geographical research analysis in Spain has been carried out by several authors in different works. Recently, J. Bosque Maurel made a detailed study of geographical research presented as «La geografía española: evolución y situación actual» at the XI Congreso Nacional de Geografía.

Geographical research and its evolution at the Consejo Superior de Investigaciones Científicas (C.S.I.C.) can not be dissociated from its progress at the University; to understand its present state we have to make a review going back to the C.S.I.C.'s creation.

In 1940, the C.S.I.C. was created to give a formal, institutional body to Spanish Science. In its chart, Geography had a place in the Instituto «Juan Sebastián Elcano»; said Institute was in the Patronato «Saavedra Fajardo», included in the Area or Division of Humanities.

In 1954, a subsidiary of Instituto «Elcano», called Department of Applied Geography, established itself at the Universidad de Zaragoza. In 1967, said Department became the Institute of Applied Geography, moved to Madrid, and was included in the Patronato «Alonso de Herrera», in the Division of Sciences.

For more than twenty years, from the very first moment, both Institutos «Elcano» and of Applied Geography were in total symbiosis with the University.

Besides their directors, Manuel de Terán and José Manuel Casas Torres, subjects of many pages, many University professors worked in both Institutos. Professors that later on continued the line drawn in Geography by Terán, Casas, Bullón, Melón, Gavira, Solé, etc.

The two journals published by the Institutos: *Estudios Geográficos*, constantly since 1940, and *Geographica* since 1954, show in the contributions by the collaborators that University and Council worked together.

The increasing number of university students that started in geographical science as well as of Geography subjects in the curricula turned many geographers trained in the Institutos from research into teaching. Posts offer was always bigger at the University than in the C.S.I.C. However, there are several university professors that obtained first a researcher post at the C.S.I.C., and later on got access to a university post. Thus, C.S.I.C. was a university professors breeding place in the starting years of Spanish Geography; most doctoral thesis read since the C.S.I.C.'s creation till 1970 were prepared there.

Though Geography was privileged since the beginning, with two Institutos and two journals, in the '80s there was a radical change.

Due to «scale economics», the C.S.I.C. started merging Institutos, mainly those in the Area of Humanities, where Social Studies disciplines were included.

With this new merging policy, and after long negotiations directed by unscientific reasonings, in 1986 the C.S.I.C.'s Board of Directors created the «Instituto de Economía y Geografía Aplicadas». The new «Applied Economy and Geography Institut» amalgamated the Institutos of Agrarian Economics, Applied Economics, «Jaime Balmés» of Sociology, «Juan Sebastián Elcano» of Geography and Institute of Applied Geography.

They gathered thus in the same Instituto researchers from different academic trainings: economists, geographers, sociologists, agronomists, and veterinarians, grouped under seemly-agreeing research lines.

Once the two Geography Institutes merged, both publications merged also under the oldest title: Estudios Geográficos.

Since the Ministry of Education decided to plan national research giving some priority lines, researchers at the C.S.I.C. (geographers included) undertook to carry out Research Projects, sponsored by different Ministry Departments as well as by the C.S.I.C., along research geographical lines developed in other institutions.

C.S.I.C. and University collaboration has never been broken; researchers at the C.S.I.C. have taken part in Doctorate Courses in different Universities, while the University professors do participate in Research Projects under the direction of researchers from the C.S.I.C.

Unfortunately, Geography's present situation in the C.S.I.C. goes through its worst period. From the existence of two Geography Institutos it has gone to its complete disappearance from the institution chart. Since October 1990, the just created «Instituto de Economía y Geografía Apliadas» became the «Centro de Investigaciones sobre la Economía, la Sociedad y el Medio» (Research Center on Economics, Society and Environment) in the Area of Humanities and Social Studies.

Nowadays, there are seventeen Geography researchers in a Scientific Division of Geographical Studies, name chosen by the researchers. They hope and wait for the C.S.I.C.'s authorities to find the scientific reason to allow Geography to reappear in the institution's chart, a place it ought to have kept.

The scientific objects of the C.S.I.C.'s geography researchers are basically analysing society-environment interrelations and its environmental consequences and studying the new problems and situations due to demographic dynamism and its economic, social and spatial consequences (de-population, migrations, intra-region and inter-regions unbalances, etc.). An applied object may be in Regional Development and technology transfer.

Methodologically, they focus on integral analysis procedures that stress diacronic dialogue between society and geographic environment, dialogue that both changes the environment and conditions society. Said general approach acts as framework for other concrete and detailed methodologies in sectorial researches.

In the last five years, the researchers have worked on:

- Aging in Spain: process, structure and geographical implications
- Applied study on the accessibility to the city of Toledo.
- Basic study of an area-problem: Sierra de Gata.
- Madrid's urban climate.
- Madrid's urban climate: the heat island.
- Geographical analysis of the provinces of Guadalajara, Toledo and Segovia: Use of Remote Sensing Techniques.
- New technologies applied to environmental diagnosis and planning in Spain and Latin-America.
- Environmental conditioning of irrigation agriculture in Western La Mancha.

The projects have been subsidized by the Comisión Interministerial de Ciencia y Tecnología, the Foreign Affairs Ministry, the Instituto de Territorio y Urbanismo, the Comisión Asesora de Investigación Científica y Técnica, and the Dirección General de Investigación Científica y Técnica.

Geography's future at the C.S.I.C. shows as very promising, if some minimum objectives are reached. These objectives are the following: to establish an Unidad Estructural de Investigación del C.S.I.C. for our discipline; to continue relating with the University, both collaborating the researchers in post-graduated teaching activities and working the professors in C.S.I.C.'s researches; finally, we need urgently a more generous research staff training grants policy. Research hardly keeps on without a continuous relay of people exchanging experience and knowledge for creativity and dreams.

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3. INSTITUTIONS DEVELOPING GEOGRAPHIC ACTIVITIES

A. CABO-ALONSO (CO-ORDINATOR)

J. BOSQUE-MAUREL

LL. CASASSAS I SIMÓ

R. NÚÑEZ DE LAS CUEVAS

A. PALADINI

Besides the Institutes or Departments of Geography attached to Universities and to the Higher Council of Scientific Research (Consejo Superior) Spain has other institutions involved in geographic activities. In the next pages we will comment on the main features of the most outstanding ones.

NATIONAL GEOGRAPHIC INSTITUTE

In 1870 the National Geographic Institute was founded in Spain by a non-military Ministry and was specially commissioned to draw a National Topographic Map at scale 1:50.000, and whose first page was published in 1875. The Institute undertook various other assignments like those connected with the determination of the Earth's shape and size, geodesic triangulations of various types, accurate levellings, weights and measures, and the topographic register of ground small-holding. It soon achieved successful recognition mainly through remarkable achievements such as the measure of the central base of Madrideojos and the invention by Ibañez de Ibero, the first chairman of the Institute, of a simple and accurate rule to measure bases. The Spanish bases were measured using these rules and also in 1880-81 the bases of Aarberg, Weinfelder and Bellinzone of the geodesic net of Swizerland. In a similar manner, it is worth mentioning the link that the Institute established in 1879 between the Spanish geodesic net and the Algerian one, which served to complete the measurement of a meridian arc, of 28 degrees wide, ranging from the Isles of Shetland to the Sahara area.

Along its 122 years, the Institute has drawn the base cartography of Spain and has established and maintains the geodesic and levelling nets. It is responsible for the geophysic information through the national seismic net and the observatories of Almeria, Málaga, Santa Cruz de Tenerife, Toledo, Santiago de Compostela, Logroño and Alicante. Moreover, it is involved in astronomic tasks in the observatories of Madrid, Yeles (Toledo), Calar Alto (Almeria) and Pico del Veleta (Granada), the last two in collaboration with Germany and France.

The above mentioned Topographic Map at scale 1:50.000 has 1.122 sheets format 20 x 10 minutes -the last one came out in 1964- and has seen three editions.

The 1870 edition, in five colours, with equal distance of curves of 20 metres, in Strave's poliedric Elipsoid projection, and taking the Madrid meridian as the source of the longitudes.

The 1964 edition, with similar features, differs, however, from the previous one in the prominence of the relief which is drawn with shading colour.

The 1970 one, which coincides with the previous two in the equidistance of 20 metres in the curves and with the last one in the shading of the relief, differs from both in the projection, being in this case the Hagford «datum» Postdam's Elipsoid, Projection UTM, as well as in the source of the longitudes, this time the Greenwich Meridian.

This Institute has published the Map at scale 1:25.000 supported by System RE-50 ever since 1975, for whose representation the Universal Transverse Marcator (UTM) has been chosen.

Other publications of the Institute include provincial maps at scales 1:200.000 and 1:500.000, maps of various autonomic regions at scales 1:200.000 and 1:400.000; a map of series «World» in collaboration with France and Portugal for the borders areas; Maps of the Iberian Peninsula, Baleares and Canary Islands at scales 1:750.000, 1:1.000.000, 1:2.000.000 and 1:2.500.000; maps of relief; topic maps; touristic and special areas maps like Straits of Gibraltar, National Parks etc.), spacial orthoimages 1:100.000 and 1:50.000, and the National Atlas of Spain.

The Institute participates in various national and international programs, such as those of spacial Geodesy, digital Cartography, Teledetection and Information geographic System, where lie the Cartographic Data Banks called BCN-25, BCN-50 and BCN-200. These Banks keep the graphic and numeric information that appears in the topographic maps at scale 1:25.000, 1:50.000 and 1:200.000, which are being digitalised and will be available to the public on magnetic tape. In order to carry out both tasks the Institute will make avail of the latest means and instruments.

In 1986 the Law of Ordination of Cartography was passed with the aim of preventing the breaking up and the duplication in the production of official cartography by the public administration. This law lays reponsibility on the State administration through the National Geographic Institute for the production of topographic maps at escale 1:25.000 and 1:50.000 and also creates two important instruments: The Central Registry of Cartography and the National Cartography Plan. The law also determines the character and functions of the Geography Higher Council.

The Institute has the status of a General Direction dependent on the State Secretary for the Water and Environment Policy, in turn belonging to the Public Works and Transport (MOPT). The General Direction has four branching Subdirections:

First, that of Geodesy and National Topographic Map; secondly, that of Astronomy and Geophysics; thirdly, the one in charge of Catographic Processes; and lastly, that running the General Secretary. In order to help sell the products the National Centre of Geographic information (CNIF) was created in 1990 as an autonomous institution. Its presidency is also held by the General Director of the Institute. From this last, two have been branched out: The Spanish Centre of Metrology and, since 1980, the Smallholding Topographic Registry.

The central premises of the Institute lie in Madrid where around one thousand specialists and administrative staff are employed. Geography Engineers are the directing staff, created in 1900.

ROYAL GEOGRAPHIC SOCIETY

This Society was founded after similar ones in Paris (1821), Berlin (1826) and London (1830) at a time when important explorations and geographic findings were being made, and when intense nationalist preoccupation and remarkable colonial tensions set the scene. Someone to show special concern for the creation of the Society was the cartographer Francisco Coello de Portugal y Quesada (1822-1899), author of *Atlas de España y sus posesiones de Ultramar*. Together with the engineer Eduardo Saavedra and the historian Joaquín Maldonado Macanaz, called a meeting with the support of the Ministry of Public Works and the director of the Royal Academy of History. This meeting was the prologue of the foundation of the Institute on 27 March 1876, which was given the name of Geographic Society of Madrid. The president elect was Fermín Caballero, father of the Spanish geographers. He died in that same year being his presidential successor the said Francisco Coello.

According to the written regulations the Society had as a central aim «...to encourage the development and spread of all branches of geographical knowledge», thus devoting itself «preferably to the study of the Spanish land, its provinces and the overseas dominions, as well as to those countries with which there are strong ties or seem convenient to be studied». All this must be seen in tune with the background of that period nationalistically biased and of colonial «esprit», even if with an undoubtful feeling of frustration and slowness clearly expressed by Coello in his address of the opening event. In it he made the proposal of «recovering the time lag, as we are making a late arrival, so as Spain, to whom the world is indebted for her many discoveries, would be taking part in what still remains to be explored».

In tune with the preoccupations of the times, the following year another institute, the Spanish Association for the Exploration of Africa, was founded, soon shifting its name to the Spanish Society of Africanists and Colonialists, and eventually becoming the Spanish Society of Commercial Geography, a branch of the Geographic and lastly merging with it since 1895.

In 1901 the Geographic Society of Madrid changed its locally biased name for the present one, namely the Royal Geographic Society. It came then under the auspices of the queen regent Maria Cristina, a heading of the State budget being assigned to it, as it was established by a decree announced by the Minister of Public Instruction.

In the first period of the Society's life, which may well span till the end of the First World War, colonial preoccupations were in the limelight, as the regulations required. Thus, the social and political backing surpassed then the academic and professional one. This was matched by the composition of its members, among which the cartographers were the only group to represent geographical interests. As important as this group were those of engineers and politicians, the whole spectrum being completed by geologists and historians. It was not until the turn of the century that geographers proper began to join it, eventually getting under their control the Secretary of the Society as well as the Library.

The Society undertook the publication of the *Boletín* (Bulletin) ever since it was founded, as «spokesman» of their various activities. To it the *Revista de Geo-*

grafía Colonial y Mercantil may be added since 1897. And whereas the latter has ceased to come out in 1924, the former has continued to be published to the present. Amongst other activities carried out in this first period of the Society, the following can be outlined: the support, including the material one, to different travels and explorations in northern Africa, more specifically to Sahara and Ifni, which were often commented in the quoted *Boletín*; the Debates on the «provincial division of Spain»; those focused on «The causes of the poverty of our land» in 1882; the meeting of a Spanish Commerce and Trade Geography Conference in 1893, and the Iberoamerican Geographical Societies Conference in 1892. And furthermore, the publication of *Geografía y Descripción de las Indias* by Juan López de Velasco in 1894; *Descripción y Cosmografía de España* by Fernando Colón in 1910-17, and lastly *Estudios geográficos de España* by Jerónimo Becker in 1917.

In the second period, which spans till the end of the 1960s, the social activity of the institution, in state Administration's tight control, diminished, in spite of a full program of talks, excursions and international exchanges still being offered. The *Boletín* was also coming out regularly and, though temporarily interrupted during the Civil War (1936-39), became the only scientific geographical Journal published in Spain during the period 1876 to 1940. In addition to this, the Society was one of the founders of the International Geographic Union and, since 1922 the Directing Board act both as the Spanish National Committee in that Union and as the staff responsible for the relationships between Spanish and international geographers. In the second period the Society published *Islario General de todas las Islas del Mundo* by Alonso de Santa Cruz in 1920; *Aviano, ora marítima* in 1924; and *Diario de la primera partida de la Demarcación de límites entre España y Portugal* in 1925-28. Then the Society began to participate in International Geography Conferences, starting by London in 1962, through contributions of Spanish geographers.

In a third period, the current one, the number of members of the Society does not vary much - now around five hundred - but their qualifications do vary: the great majority are geographers proper, a fact due to the new impulse of geography teaching at Universities since 1940 and particularly during the 70s and 80s.

To these must be added the geography engineers and a significant number of Secondary School Geography teachers. Titles were continued to be published like *Los puertos españoles* in 1946; *Diccionario de voces usadas en geografía física* by Pedro de Novo in 1949 among other.

The Society keeps its institutional and collective presence in the IGU Conferences through those who are professional geographers in our country. It has been present at New Delhi, Moscow, Tokio and Sydney presenting on those occasions a volume of papers as *Contribution of Spanish geographers*. Since the beginning of the 80s representatives of other geographical associations like the Scientific Research Council, the National Geographic Institute and the University were allowed to join the staff of the IGU Spanish Committee. The climax of the present period was the meeting of the Regional Conference of the Mediterranean Countries in 1986. It was sponsored by the Geographical Society and was organized by a committee where Professor Vilá Valentí, then director of the Department of Geography at Barcelona University and vicepresident of the IGU, had a leading role. The principal session of the Conference was held in

Barcelona, the various working groups or committees meeting in turn at other university cities.

The Society continues to plan excursions and scientific visits, as well as to hold series of talks, panel discussions, training and qualification courses, often in collaboration with other institutions, like the Madrid City Council, the Complutense University, the National Geographic Institute, the Royal College of Doctors and Bachelors, the Army Geographical Service, etc. The most outstanding evidence, however, of the Society's active life is the publications, above all in the *Boletín*, which has reached the volume CXXV.

Since 1976 the Society's Directing Board is chaired by Dr. José María Torroja Menéndez, geographical engineer and Professor of Astronomy of the Complutense University of Madrid. The house of the Society lies in the Royal Academy of Sciences.

THE GEOGRAPHICAL SERVICE OF THE ARMY

In mid-18th century the European states undertook the surveying of detailed maps of their respective lands in order to meet their military needs and encourage the economy. In all of them the armies were the ones to undertake that job. The same happened in Spain, where the Military Engineers Corps, created in 1711, was entrusted with the drawing of the maps of the kingdom and its provinces besides the population and fortification plans of the metropolis as well as overseas lands. Years later the majority of those cartographic services was taken over by the General Staff of the Army, created in 1810 but effectively in force since 1836. Two years later the so called Deposit of War was created as the specialised institute responsible for the drawing of military cartography. In 1942 took up its present name as Geographic Service of the Army.

This Service is incumbent on:

- The direction and performance of geodesic, astronomic, topographic and cartographic tasks necessary for the formation, publication and updating of military cartography and those concerned with the role of the army in peace and war.
- The formation and specialization of the suitable personnel so as to meet the specific demands of the Service and the army in general.
- The organization of the Geodesic, Topographic and Cartographic Service in times of war and the mobilization of the specialized personnel suitable for it.
- The collection of data, publications and investigation concerned with Spanish and General Geography.
- The distribution and sale of reglamentary military cartography.
- The acquisition, repair, mending and testing of topographic material, as well as the report on its usefulness.
- The publication of regulations and other printed documents of the General Headquarters of the Army.

- Represent the General Headquarters of the Army before similar military and civil services, national as well as foreign, in the High Geographic Council, in the National Committee of Geodesy and Geophysics and in the International Committees of Boundaries with France and Portugal.

Since 1987 the Service has joined the research programmes carried out by the Spanish government in the Antarctica. With this view in mind, several officers are sent there every year so as to perform geodesic-topographic surveys in the Spanish base of the Levingston and Deception Islands. In 1989 the Service developed a system of Military Geography information (SINFO-GEO) to which the digitation of the base-map Series L altimetry of the whole national territory has been added at scale 1:50.000, and currently planimetry is being tried. Finally, 1991 is the date of the project of publishing the Military Map of Spain at scale 1:25.000 distributed by NATO.

The Service is structured thus: Headquarters, Technical Departments, Body of Troops and Army School of Geodesy and Topography. Headquarters includes the Technical Secretary, embracing a Computer section, nine detached Geography Committees and three Topography sections; and the High Staff which includes the Personnel management, Information and Protocol, Planning, Frontiers, Resources and Economic-Administrative section. The Technical Departments include Photogrammetry, Automatic Cartography, Cartographic Education, Cartographic Reproduction and Geographic Studies and Archives. The School of Geodesy and Topography is in charge of the Promotion and Updating courses, the education of Military geodesians, topographers and cartographers as well as photographic interpreters.

The Service is based in the outskirts of Madrid, in barracks built in 1978 over a surface of 52.526 m² where there are six buildings which house both the troops and the above mentioned departments.

SPANISH GEOGRAPHERS ASSOCIATION

Before the 1940's the teaching of Geography in higher education consisted of little more than its physical aspects, being provided in University Faculties of Sciences. This panorama began then to be changed. Firstly, with the foundation of Geographic Institutes inside the Scientific Research Higher Council, and secondly, with the gradual increase of tenured posts as University lecturers in Geography. In both places were educated those who, having achieved their graduation, had to teach this subject to University centres, and to the existing Secondary education schools, plus the numerous ones that were being created. A wish soon sprang to create an organization that would link teachers and researchers of Geography, while providing channels for their activities. An eventual agreement was the accomplishment of that wish when the IV Colloquium of Geography was held in Oviedo in 1975. In the next one held in Granada two years later the Spanish Association of Geographers was founded. In it the Statutory Rules were passed, the first Directing Board was elected and Dr. Jesús García Fernández, the then Director of the Department of Geography in Valladolid University, was appointed first chairman. He excelled in his enthusiastic and active support in favor of the foundation of the Association.

According to the initial articles of the Rules, the Association was created in order to «promote and develop the Spanish geographic science». This basic purpose involved:

- holding scientific meetings.
- contributing to a better understanding of our science.
- achieving a consensus among the members before other institutions and whenever the Association be represented.
- co-ordinating the whole body in favor of Geography and
- collaborating with other geographic associations.

In order to achieve these goals the mentioned Rules pointed to some activities to be developed like: the meeting of scientific colloquia biannually, the organization of an information system on research work, the publication of the Spanish geographic activities and, if possible, the publication of worthy works.

Before that Colloquium in Oviedo other three had been held in Zaragoza, Madrid and Salamanca. All of them were backed by the Association for the Development of Sciences and lacked any kind of periodicity. In Granada's the Geographers Association, faithful to its founding Rules, took upon itself the organization of Colloquia every two years, and hitherto this has been the rule. The following Colloquia were held in Palma de Mallorca, Pamplona, Barcelona, Murcia, Zaragoza, Madrid (Complutense University) and Valencia; this last was the 11th held in 1991. The traditional denomination of Colloquium has been changed for that of Congress.

These are not the only scientific meetings encouraged by the Association. Every two years Colloquia of Rural Geography have been held in town like Alicante, La Rábida (Huelva), Jarandilla de la Vera (Cáceres), Santa Cruz de Tenerife, Santiago de Compostela, and lastly in 1991 Madrid (Autonomous University). Also, in recent years Iberian Coloquia have been held. They were initiated in Salamanca and the next were held, in turns between Spain and Portugal, in Lisbon, Barcelona, Coimbra and lastly in 1990 in León.

Those geographers specialised in the physical aspects of our science had been in frequent contact with the aim of studying various areas of our country. Once the Association was created, these meetings were substituted by the so called «Fieldwork Conference on Physical Geography». Since 1985 they have been held every year in Madrid, Barcelona, Sevilla, Murcia, Cádiz, Salamanca and Mallorca.

In all of them the central issues which have been discussed include not only morphological aspects but also climatic and biogeographic ones. Also worth mentioning are the Industrial Geography Conference, initiated in Madrid and followed by those held in Santiago de Compostela, Seville and Salamanca; the Conference on Geography of Spanish Population, which has been held three times in Salamanca, Palma de Mallorca and Malaga; and several others.

Amongst the meetings in progress or already called are: the 1st National Conference of Geography on Latinoamerican Countries, to be held in La Rábida (Huelva), the 4th Meeting of the Industrial Geography Group, the 7th Fieldwork

Conference of Physical Geography called by Santiago de Compostela; a new Colloquium on Iberian Geography to be held in Porto (Portugal); the 4th Summer Course of Geography devoted to Technology, Risks and Territory, and so on. Of course we are leaving out those that were and are being supported by some of the members of the Association independently from the Association's intervention, like the two on Iberoamerican Geography held in Salamanca and expectedly to be continued by the colleagues in the National Autonomous University of Mexico.

The numerous and frequent meetings are held thanks to the existence at present of some 40 University Departments or Institutions of Geography in our country, as well as to the number of teaching or research members, some 800 in the Association. Some of them are working in public institutions or in consultancy companies concerned with the territory planification and surveying. The great diversity of geographical aspects under their scrutiny has been the cause of the creation of Work Groups inside the Association. The following can be noted:

Physical Geography

Geography Didactics

Rural Geography

Population Geography

Industrial Geography

Quantitative Methods

Latin America

Urban Geography

Transports, and

Geography of Leisure, Entertainment and Travel

The Association Directing Board decide on the programme of the different scientific meetings as well as on those responsible for their organization. The meetings must be split up into various partial discussions due to the high number of participants who are able to present their work in them. All Conferences or Colloquium consist of workshops and debates, planning one or several study visits to the city of venue and its surroundings, as a complementary event. The reason why the venue changes continuously is due, among other things, to a sharing in the hardships of organization as well as to the participants wish to know directly the geographic features and transformation of different areas, this being helped by the excursions.

The Spanish Geographers Association sponsors the publication of the Proceedings of the scientific meetings. In some cases the publications of national conferences bear the same title of those meetings. For instance, the *IX Coloquio de Geografía* o, also the *X Congreso Nacional de Geografía*. In other cases, the titles bear relation to the themes dealt with in the conference. Thus, the Proceedings of the Colloquium held in Granada have the title of *Medio Físico. Desarrollo Regional y Geografía*. In the case of the editions of papers submitted in meetings which deal with partial aspects of our science, the titles are related to their theme. Thus, for instance, *I Coloquio Ibérico de Geografía*, or in a si-

milar way, *III Coloquio Nacional de Geografía Agraria, Actas del IV Coloquio de Geografía Rural, Terceras Jornadas de la Población Española*, etc.

The Association has published other titles: *Los paisajes rurales de España* in 1980, and *La Región y la Geografía Española*, of the same year, both the result of meetings held for the purpose and beside the regular ones. In any case, the publication is arranged with the financial support of the University that is the venue for the actual meeting, or the support provided by other institutions. There have been cases when this last has been the only one to bear the expenses. Thus, the great majority of the papers submitted to the Rural Geography Colloquium held in Santa Cruz de Tenerife were given to the print by the Ministry of Agriculture, Fishing and Nourishment in 1987 with the title *Estructuras y regímenes de tenencia de la tierra de España*.

The Association has its own *Boletín* since 1984. The twelve issues which have come out since 1991 include articles, themes for debate, information on Spanish and international geography and on the various research groups, news about other activities of interest for the members, also news about recent presentation of doctoral thesis, and book reviews. Furthermore an urgent informative sheet is sent out entitled *Noticias Geográficas* every four months. The first one, appeared in 1992, includes information about the Association itself and the research groups, about the courses, conferences and seminars announced in Spain and out of Spain, new publications and books received, and lastly as «*Varia geographica*» a list of address of the Geography Departments in Spain.

Amongst the rest of the activities that are worthy of note is the collaboration with the Royal Geography Society in the publication presented to the Conferences held by the International Geography Union as *Contribution from the Spanish geographers*. This Association is based in Madrid, in the premises that also house the Scientific Research Higher Council.

REGIONAL INSTITUTIONS

The institutions mentioned so far cover the national geographic area and, similarly, their members concentrate on aspects that refer to any of the autonomous Communities of Spain. Besides, some of these regional Communities have institutes or geographic societies that focus their activities primarily on their own region. Thus, the case of Catalonia is outstanding, having several geographic institutions. One is the so called **Institut Geogràfic de Catalunya**, founded in 1978 inside the department which is in charge of territorial policy and public works in the autonomous government or «*Generalitat*». We may also mention, among other geographic societies of Catalunya privately financed, the *Societat Catalana de Geografia* y la *Associació de Geògrafs Professionals de Catalunya*. Both deserve further comments.

The *Societat Catalana de Geografia* was founded in 1935 by a group of people interested in geographic studies: Pau Vila - the first chairman - Eduard Fontseré, Lluís Solé, Josep Iglesias and Pere Blasi, among others. The new society, since those early stages, was integrated in the «*Institut d'Estudis Catalans*», as a branch of this institution, holding its ordinary academic sessions in the premises of the Institut in Barcelona.

The Society directed its activities towards the study of geographic issues concerned with the Catalan region. Nevertheless, more general scientific analysis and discussions were not rejected, allowing in their programme room for the analysis of new theoretical trends, the methodology of the science as well as information about the research of foreign geographers who were invited to discuss it in the «Societat». Along the years a great number of investigators of different persuasions and origin have visited us: English and American, French, Brazilian, Hungarian, Indian, Israelite, Italian, Mexican, Polish, Portuguese and similarly, a number of geographers from different parts of Spain have been invited for a lecture.

The discussion raised in the conferences and debate is the spark for more and more frequent and wide range brief courses.

They deal with demography, geomorphology, urban questions, environment, space and territory, geographic thought, climatology, didactics and geography teaching, statistics and photointerpretation, mountainous regions problems, commercial activity territory, etc. These brief courses have been lectured on an interdisciplinary basis by outstanding geographers and scientists of other research areas. Among the directors of the courses can be mentioned: Anna Cabré, Lluís Cassasas, Paul Claval, J. Gómez Mendoza, A. Gómez Ortiz, J. Martín Vide, Emilio Murcia, A. Montserrat, David Serrat, J. Tricart, T. Vidal, Pau Vila, Joan Vilá, etc.

Sessions of the Societat Catalana de Geografia are held in other Catalan places: Berga, Falset, Figueres, Fraga, Girona, Granollers, Leida, Manresa, Sabadell, Terrassa, Villafrance, etc.

Either by own initiative or by request of other institutions, the Society has taken part in discussions on toponymy, dry grain growth in river basins, defence of volcanic land, threatened forest preservation, local council boundaries, territorial division of Catalonia, etc.

The influence of the Societat Catalana de Geografia outside is increasingly gaining ground. Among the latest collaborations with groups of foreign geographers are worth mentioning: The organization in Barcelona of the Third Plenary Session of the International Permanent Group of the Textile Industry Geography; also the Meeting of the Research Group «Geography and Public Administration» of the IGU; and the Catalano-Magyar Colloquium on Regional and Urban Planning; besides, the Conference on Regionality and the Intermediate Institutions; and lastly, the Commercial Activity Group Meeting.

Many of these activities are recorded in the *Trevalls de la Societat Catalana de Geografia*, which is being published by the Society since 1984, having come out 30 issues until the end of 1991. Usually, each of them includes a section with all the lectures given in the Society, contributions, reprints of worth reading old articles (with the addition of commentaries referring to the author and other circumstances) and notes of general interest such as bibliography, address lists, forthcoming activities, etc. A main characteristic of this publication is the welcome given to young investigators in the field.

One of the recent performances of the Society has been the organization of the First Catalan Geography Conference held in March 1991. 24 long papers were

presented and up to a hundred shorter ones. The papers were divided into nine thematic groupings which, with the purpose of spreading the Conference through the whole Catalonia, were based in nine important town. The Proceedings of the Conference have been published by the Societat Catalana de Geografia in three recent volumes.

The Society has now 400 members and the chairman is Vicent Biete Farré. It is based in Barcelona, in the same premises as the Institut d'Estudis Catalans.

In the same Autonomous Community of Barcelona there is another institution which has a geographical character, namely the Professional Association of Catalan Geographers. The need was felt of this association since «the activity of the geographers in the applied field of the analysis and territorial surveying, and the new instrumental techniques from a professional perspective, that is, paid for, with full time dedication and job regularity... has experienced a remarkable development». For these reasons the Association was created in 1988.

In a Review published by the Generalitat de Catalunya and the Catalan Institute of new Professions the reasons for the foundation of the Association are clearly exposed. There it is made clear that it will serve the purpose of holding together the great majority of the professional geographers with a non-teaching job in Catalonia, privately as well as in the state administration. Put in clearer terms, this wish has been expressed thus: «The Association is open and wishes to reach all the geographers interested in applied Geography professionally practised, whether they are at present directly involved or indirectly».

Hence, the aims of the Association proposed:

- to encourage and support the geographers' activities in the aspects of geographic analysis, in territorial surveying and in the development of the instrumental disciplines.

- the representation, support and promotion of the interests of the members in the cultural, social, economical and professional aspects.

- to spread news of the geographers activities in the field of analysis and territorial surveying and in the new instrumental disciplines.

- to easy the exchange of experiences among the members as well as the application of their knowledge and preparation, either in their own professional speciality or in related fields.

Consequently, the activities carried out by the Association in order to accomplish these aims are:

- Organization of open debates on professional experiences in applied Geography (urban research, territorial survey, cartography, territorial boundaries, etc)

- Handling the members' documents.

- Legal advise on issues affecting the practice of the profession.

- Intervention before the institutions and centres involved in the geographer's professional activity.

- Organization of courses on cartographic techniques and applications as well as talks in order to make the professional aspect of Geography widely known.

This last aspect is thought to include cartography, photointerpretation, systems of local geographic information, teledetection, toponymy, meteorology and climatology studies, prevention of catastrophic risks, environment handling, environmental studies, statistics planning, demography and population studies, urban studies, activities localization studies, rural studies, public investment planning, service administration and management, public health, functional spaces delimitation, tourist industry, council territory delimitation, territorial boundaries and publishing activities.

In another Autonomous Region, the Basque Country, there is a locally denominated *Euskal Geografi Elkargoa* i.e. Basque Geographic Institute «Andrés de Urdaneta» (INGEBA). It was founded as Social Activity of the San Sebastián (Saving Bank) and the name of Andrés de Urbaneta was added as a homage to an outstanding local cosmographer and explorer of the past. Further financial support has also come from other institutions, but the Institute keeps up its independent status. The founding project explained that the Institute «aims at encouraging all type of research work of geographic character on the Basque Country». The reason for its foundation was «the lack of a specialized centre of this type of investigations and activities justifies, even more, its creation and bringing into service». Making well clear that it was done «at an exciting moment for all Basque people, politically, economically and socially speaking», and furthermore, understanding that the Institute «is called to fill a gap in our scientific and cultural scenery, as well as to accomplish an important mission».

At the time of the foundation, the geographic work ahead had been stressed as fundamental in the INGEBA, since, as it was said, Geography «is an active science, and an applied and modern one for that, which could decisively contribute to guide our activities and to put our lives in harmony with everything in our geographic space; also to know, understand and love more and better our land». It was understood that Geography is a science of synthesis, the study of spacial relations of the phenomena, of the organization of the humanized space and scenery, «taking into account the fundamental principles of localization, distribution, generalization, activity, causality and connection».

According to all this, the main activities of the Institute are:

- Geographic research, following the latest scientific orientations in this branch of knowledge.
- The education of specialists in the geographic knowledge of the Basque Country,
- The rigorous publication research.
- The distribution of informative sheets to all members of the Institute.
- The organization of scientific courses, lectures and excursions.
- To build up a Library of Geographic specialization
- To participate in national and international scientific activities of non-governmental character, and lastly,
- To publish the journal *Lurralde. Investigación y Espacio*.

The first issue of this last publication came out in 1978, is biannual and contains scientific articles, geographic news and information about INGEBA itself.

4. FIFTY YEARS OF GEOGRAPHY IN SPAIN: A REVIEW BASED ON THE ANALYSIS OF ACADEMIC GEOGRAPHICAL JOURNALS

A. ALBET
M.D. GARCÍA-RAMÓN
J. NOGUÉ-FONT

INTRODUCTION

The bibliometrical analysis of articles appearing in Spanish academic geographical journals between 1940 and 1988 provides meaningful indicatives for an appraisal of the evolution of research fields and the scope of their study, as well as the characteristics of authors, journals and the university geography departments. In this period, a total of 29 journals can be identified; although, only 20 of them have a sufficient number of volumes to be of any statistical significance, given that the dates of the first edition differ and that their publication has been irregular (see Table 1).

Similarly, the study of references included as footnotes and in bibliographies are not only easy to analyse and appraise but also provide criteria for evaluating the process of thematic and methodological innovations in Spanish geography through a study of its receptiveness to foreign influences. These aspects (approached thematically or through a consideration of various significant variables) have been studied in depth elsewhere by these authors (García Ramón, 1986; García Ramón et alia, 1988; García Ramón & Nogué, 1984,1989). Others have undertaken diverse analyses (of research work included in Spanish geographical journals, of these mention should be made of Almoquera et alia, 1984; Del Río, 1975; and González & González, 1986, the latter being a study of Geographical Conferences and Symposiums).

The work published in these journals is indicative, to a large extent, of the changing fortunes in their own history and of their respective editorial policies but, moreover and very closely related to this, the work is also representative of the academic community of geographers.

EVOLUTION IN FIELDS AND SCOPE OF RESEARCH

A consideration of those articles published in these journals between 1940-1988, reveals the overall predominance of themes from human geography which comprise 51% of articles published, reaching a peak in the period 1950-69 (see Table 2). Although in absolute terms between 1969 and 1984 a five-yearly increase of 50% (approximately) was recorded, the proportion of articles in human geography (with respect to other research fields) fell from 66.7% to 42.8%, so that at the end of this period they represented 49.7% of the total. The most represented research areas are rural geography, historical geography and

TABLE 1
LIST OF ACADEMIC GEOGRAPHICAL JOURNALS (1940-1988)

título	universidad	published since	n° vols.
Anales de Geografía de la Universidad Complutense	Univ. Complutense (Madrid)	1981	7
Baética	Univ. de Málaga	1983	2
Boletín de la Asociación de Geógrafos Españoles	Asociación de Geógrafos Españoles (Tarragona)	1984	1
Cuadernos de Geografía	Univ. de València	1964	34
Cuadernos de Investigación Geográfica	Col. Univ. de La Rioja (Logroño)	1980	6
Cuadernos Geográficos de la Universidad de Granada	Univ. de Granada	1971	11
Didáctica Geográfica	Univ. de Murcia	1977	9
Documents d'Anàlisi Geogràfica	Univ. Autònoma de Barcelona	1974	12
Ería	Univ. de Oviedo	1980	7
Estudios Geográficos	Consejo Superior Investigaciones Científicas (Madrid)	1940	167
Geo-Crítica	Univ. de Barcelona	1976	56
Geografía y Sociedad	Univ. de Cantabria (Santander)	1981	1
* Geographica	Inst. de Geografía Aplicada (Madrid)	1954	25
Geographicalia	Univ. de Zaragoza	1977	14
Investigaciones Geográficas	Univ. d'Alacant	1983	3
Lurralde	Inst. Geográfico Vasco (San Sebastián)	1978	8
Norba	Univ. de Extremadura (Cáceres)	1981	1
Notes de Geografia Física	Univ. de Barcelona	1979	11
Papeles del Departamento de Geografía	Univ. de Murcia	1970	8
Paralelo 37	Inst. de Estudios Almerienses (Almería)	1977	7
Publicaciones del Departamento de Geografía	Univ. de Valladolid	1966	1
**Revista Catalana de Geografia	Inst. Cartogràfic de Catalunya (Barcelona)	1978	10
Revista de Estudios Andaluces	Univ. de Sevilla	1983	4
Revista de Geografía	Univ. de Barcelona	1967	18
Revista de Geografía Canaria	Univ. de La Laguna	1984	1
Revista de Geografía de León	Univ. de León	1985	1
Tarraco	Univ. de Barcelona (en Tarragona)	1980	3
Treballs de Geografia de Palma de Mallorca	Univ. de les Illes Balears (Palma de Mallorca)	1975	10
Treballs de la Societat Catalana de Geografia	Societat Catalana de Geografia (Barcelona)	1984	16

Source: Own elaboration

* Between 1954-58 it was published at the University of Zaragoza

** Between 1978-84 it was published by the Societat Catalana de Geografia (Barcelona)

population geography respectively. The three taken together comprise 55.7% of the total number of articles in human geography.

Almost one fourth of the articles published (23.7%) correspond to physical geography. In the 40s their presence was more important due to the development of studies in geomorphology, but subsequently the incidence of articles in this field declined dramatically reaching its lowest point in 1965-69 (scarcely 9%).

TABLE 2
EVOLUTION OF ARTICLES ACCORDING TO RESEARCH FIELDS (in %)

	1940- 1944	1945- 1949	1950- 1954	1955- 1959	1960- 1964	1965- 1969	1970- 1974	1975- 1979	1980- 1984	1985- 1988	1940- 1988
Physical Geography	34.3	27.2	16.2	12.9	17.6	9.0	16.4	22.8	34.4	24.0	23.7
Human Geography	56.2	48.1	70.8	66.6	65.4	66.7	52.9	44.9	42.8	49.7	51.0
Methods & Concepts	3.0	8.0	3.0	8.1	8.2	12.8	17.1	23.5	12.5	19.6	15.8
Others	6.5	16.7	10.0	12.4	8.8	11.5	13.6	8.8	10.3	6.8	9.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Own elaboration

From this moment on the trend was reversed and since 1980, when the proportion rose to 34.4%, a marked recovery has been observed with the publication of numerous articles in geomorphology, biogeography and climatology.

Articles dedicated to methods and concepts in geography do not represent more than 15.8% of the total (mainly related to the history of geographical thought) in the period under review. It should, however, be noted that their presence increased noticeably after 1965 reaching a peak (23.5%) in 1975-1979. The increase in these articles in given periods may be considered as a significant indicator of a growing interest for new approaches and methodologies.

With respect to the remaining articles, «others», which cannot be classified within these three groups, it is worth noting that up to 1964 there was a predominance of regional studies, after this date many articles related to cartography were written and, since 1975, many articles on didactics of geography have been published so that around 1980 about 35% of articles in this group were in applied geography.

Related to the thematic predominance of the various aspects of human geography, it is interesting to note that the scope of 68% of the articles refers to research carried out within Spain. Of these 18.6% refer to the «comarcas» («pays») and 16.8% are regional (approximately corresponding to the autonomous communities). Although over the whole period 18.6% of research refers to areas outside of Spain (mainly studies of other states) it is worth recording that between 1940 and 1954 more than 60% of articles referred to foreign areas so that in 1950-54 only 29.2% of articles were related to Spain. But from here on (and very quickly) the trend was reversed so that since 1960 articles whose scope of research remains within Spain constitute more than 76% of the total. Articles which make no reference to any geographical region comprise a small proportion of the total although after 1970 this number increased considerably coinciding with the growth in interest for geographical methods and concepts.

Although, overall, 77.1% of the articles are attributed to men (and 13.6% to women; the rest being of joint or unknown authorship), the number of articles written by women has gone from absolute zero in 1940-44 to a figure of 20.2% (1985-88), with certain increases being observed mainly after 1955 and 1970.

A study of research areas shows that women in the main have written about aspects of urban geography, rural geography and population geography respecti-

vely; human geography constituting 60.6% of of the articles written by women. The inclusion of studies made by women in human geography became evident after 1955 although the number did not become significant until 1970. In contrast, the contribution to physical geography and to methods and concepts in geography did not become significant until the end of the 70s.

Slightly more than one fourth (25.9%) of studies carried out on a local level within the Spanish state are by female authors. This confirms the relative «specialization» of the research undertaken by women to classic research areas, using traditional methodologies based on small scale areas within the Spanish state, and is a reflection of the limitations and marginalization that women have experienced in the academic and social contexts during many years. Indeed the study of foreign areas or the presentation of articles which make no reference to a specific region by women (largely a reflection of an overcoming of these disadvantages) did not become more prevalent until the end of the 70s and the start of the 80s (overall 85% of the articles written by women refer to the Spanish state).

Around 70% of articles in physical geography, human geography and in the category «others» refer to Spain; while, 59.7% of the articles referring to foreign countries and 55.9% of those referring to Spain are in human geography.

Looking at the evolution of the distribution of references by languages (Figure 1), we observe that references in Spain's languages have always a high percentage with a peak in the 60s. In the last decade this high proportion tends to decrease. References in French maintain a discreet presence tending to decline, which reflects the essential but decreasing influence of the French school on Spanish geography. References to German papers were high at the beginning of the 40s partly because of the political situation that favoured contacts with the nazi Germany. References to English papers start to appear from 1945 onwards, partly substituting the German ones, declining in the 60s and experiencing a steady growth from 1970 onwards.

THREE REPRESENTATIVE JOURNALS

Without wishing to present an exclusive or definitive selection, it is possible to identify three publications among the collection of academic geographical journals which may be considered of particular historical importance and value and in turn, representative of the diversity of events and circumstances within the recent history of Spanish geography (Figure 2).

The journal *Estudios Geográficos* published since 1940 by the «Consejo Superior de Investigaciones Científicas», was for nearly 15 years the only academic journal in existence, being initially a good indicator of the development and nature of Spanish geography of the time and a reflection of the influences of historical and social change. However, in the period analysed, the journal has remained faithful to its traditional research fields and to the methods and concepts used. The journal has predominantly published articles in rural geography (14%), historical geography (13%) and geomorphology (12%); overall, articles in human geography comprise 62% of the total and physical geography 21%, while applied geography scarcely reaches 1%; 86% of the articles are signed by men and practically all the contributors are Spanish. With regard to

bibliographic references, 70% are to works written in the languages of Spain (Basque, Castilian, Catalan, Galician); references to works in English do not become significant until the start of the 80s while in the early 40s the number of German references is very important. Foreign references are most noticeably present in articles in physical geography (49% of the references) and in studies of methods and concepts (55%); while, in applied geography and in regional studies references in the languages of Spain comprise around 90%.

Of equal relevance is the journal *Geographica* which, having begun life in Zaragoza in 1954, played a very important rôle in the early years of its publication in Spanish geography as regards the importation and diffusion of innovative ideas, before a change in orientation transformed its contents and influences. Both stages are a clear reflection of developments in Spanish geography during the period. The contribution of *Geographica* has been of great importance both quantitatively and qualitatively (giving abundant coverage to the latest theoretical and methodological trends at an international level); reflected in the numerous articles signed by non-Spanish contributors and, above all, in the publication of foreign book reviews (which comprise 64.4% of books reviewed in the period) and reports (88.4% of which are also foreign, being the greatest proportion among all Spanish journals).

Documents d'Anàlisi Geogràfica on the other hand, is representative of a new style of journal (a style reflected in other journals also published in Barcelona, such as *Revista de Geografia* published since 1967 and *Geocrítica*, which first appeared in 1976) with new research interests and methodologies and an innovativeness which is realised not only in a greater receptiveness to foreign influences but also in a direct and dynamic application of these trends. Thus the journal specializes in articles related to specific themes in methods and concepts of geography (53%) as well as human geography (39%), while physical geography is largely overlooked (1% - only 2 articles). Initially (1970-74) 80% of the contributors were foreigners and in the following five-year period they continued to predominate (52%); the foreign influence is also reflected in the book reviews as non-Spanish books comprise 77% of the total number of books reviewed. An analysis of the original language of the references quoted in the articles is again indicative of the great influence of texts published in Britain and America (41%) as well as in France (13%), while references to works in the languages of the Spanish state comprise 39% of the cases. It is apparent that references in English are concentrated in those articles related to methods and concepts, and more specifically, in discussions of techniques and methods and state of the art studies.

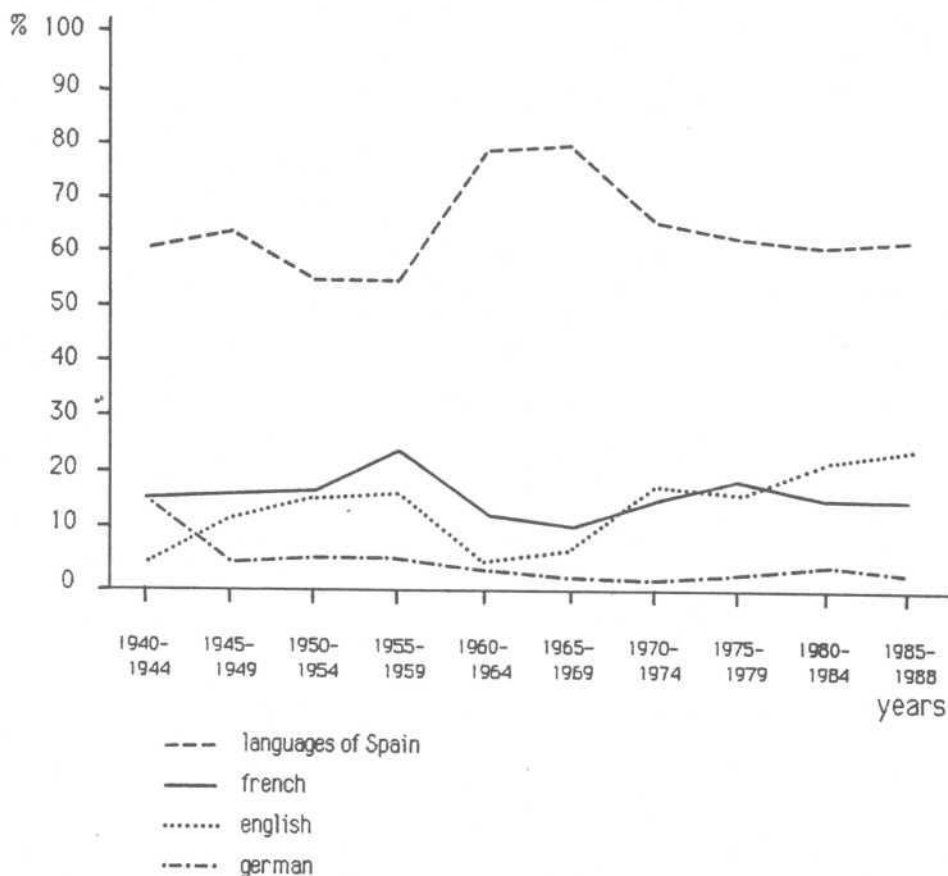
CONCLUDING REMARKS

Clearly, the frequency of reports, reviews and references to foreign works can not always be interpreted as a clear indicator of innovativeness (thematic or methodological) as this is largely conditioned by the research field, which generates a greater or lesser proportion of such references. Moreover, in each research field this might have a different meaning given that the evolution and intensity of the innovations recorded have been equally distinct. Although, it is evident that such an analysis cannot be extrapolated to other countries or contexts, considering the reality of Spanish geography in recent decades it seems difficult to deny that thematic and methodological innovation has not been related to contacts with the

geography of other countries where the discipline has enjoyed greater vitality and has reached a higher level of development.

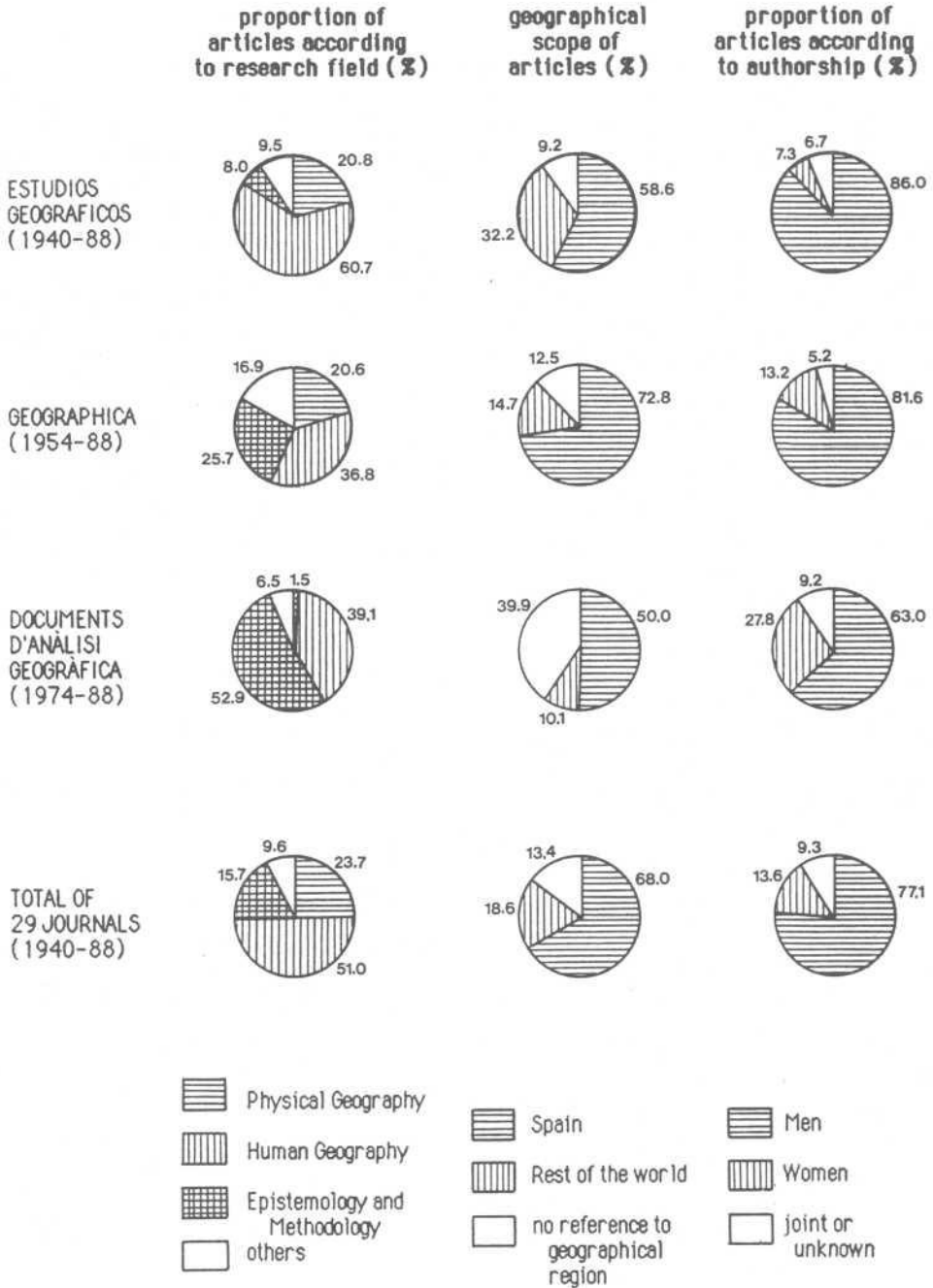
Hence, the distribution by language of the non-Spanish references and book reviews reflects the changing influence of various schools on Spanish geography: overall, the French influence maintains a discrete presence with a slightly increased tendency since the interwar years, evidence of the fundamental but now declining influence of the French school on Spanish geography. In the 40s there was a brief but strong German influence, resulting in part from the political situation which encouraged contacts with Nazi Germany, but which was due, above all, to the establishment of scientific links and the training of a large sector of Spanish university students in Germany in the period prior to the Civil War, though later they were quickly severed. It was in 1945 when references to works

FIGURE 1
EVOLUTION OF BIBLIOGRAPHIC REFERENCES ACCORDING TO LANGUAGE (%)



Source: Own elaboration

FIGURE 2
THREE REPRESENTATIVE JOURNALS



in English began somewhat timidly to appear, replacing in part the German influence, and following a slight fluctuation in the 60s, their presence experienced a new and uninterrupted rise in the 70s (comprising 23% of the total references in the 80s) being most influential in those journals with a reputation for being most innovative.

While *Estudios Geográficos* reflects the continuity and maintenance of certain classical geographic conceptions, *Geographica* is an isolated precedent of an innovative journal in both research fields and methodological aspects. *Documents d'Anàlisi Geogràfica* is an example of a publication which is concerned with the introduction of new concepts and study methods, being above all concerned with the theoretical debate of the general principles of geography. Journals which belong to this last category show a remarkable homogeneity in their content, characterized by the little importance given to physical geography, a high percentage of articles related to methods and concepts, a discrete presence of human geography and a relatively small proportion of articles examining small territorial areas (indeed, a large part of the articles do not make reference to any geographical region due to their methodological nature).

It is interesting to note the contradiction between this relative thematic specialization in journals most open to foreign influences and the frequency of foreign references in the distinct research fields in general (for example, the very high proportion of foreign references in studies made in physical geography in comparison with the proportion in human geography). The fact that the growth of studies in physical geography is still recent goes somewhat in providing an explanation for this discrepancy. It should also be noted that the journals least open to foreign influences are those in which there is a predominance of local studies.

Bellaterra, april 1991

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5. PROFESSIONAL GEOGRAPHY AND INSTITUTIONALIZATION OF ACADEMIC GEOGRAPHY IN SPAIN*

M.D. GARCÍA-RAMON
J. NOGUÉ-FONT

The professional practice of geography and its academic institutionalization have not been parallel in Spain. Before 1940, there were outstanding examples of professional geography, though at that time the discipline was almost absent from Spanish universities. After the Spanish Civil War (1936-39), however, and especially during the 1960s and 1970s, there was an intensive process of institutionalization of geography, just as its professional practice all but disappeared. Only after 1978 did academic and professional geography finally come together. This paper analyzes the causes of their historical separation and discusses the current status of geography in Spain.

SPANISH GEOGRAPHY BEFORE 1940 OR GEOGRAPHY OUTSIDE THE UNIVERSITY CLASSROOM

It is well known that in most European countries primary education developed during the second half of the nineteenth century either under state initiative or under that of private institutions (mainly religious). The teaching of geography took advantage of this process as it was included in most of the syllabuses of primary and secondary education (Capel, 1981). As a result of this development the first chairs of geography were created in European universities, in combination with other factors such as the role of Geographical Societies in connection with colonial expansion or the consideration of geography as a key element in the creation and diffusion of a sense of national identity among citizens.

A similar process also took place in Spain. In 1857 a bill was passed (the Public Instruction Act, also known as «Ley Moyano») that rationalized the numerous and chaotic syllabuses and reforms of public instruction that had appeared since the beginning of the century. This law became the basis for all the legislation related to teaching until the early decades of the twentieth century. Under this law many primary schools were opened all over the country, Teacher Training Colleges were also regulated and consolidated and primary education was made compulsory- and free for all those who could not afford it.

The «Ley Moyano» firmly established the teaching of geography in primary schools although it was less important than subjects like grammar, religion or calculus (Capel et al. 1985). The teaching of geography was also present in secondary schools with a basically descriptive bias and closely related to history, as can be observed in the Ministerio de Fomento's Newsletter, 22th August 1861:

«the teaching of geography will give only very basic ideas in the section of astronomy and physics but in the political and descriptive sections it will

* A similar version will be published in the journal *Nederlandse Geographische studies*

embrace the knowledge of the world's regions, in particular Europe and with a very special emphasis on Spain and its old and present colonies, and it will always be completed with practical exercises with maps...the teaching of history will be always accompanied by references to the previously acquired geographical knowledge» (Royal Decree and Instructions, 21st, 22nd, and 23rd August 1861, quoted in Capel 1985, p.54)

It must be pointed out that in earlier syllabuses in secondary school, geography was considered as a scientific subject to be taught in the first year together with geometry and arithmetic. This is an important turning point with relevant consequences for the later development of geography in Spain. Although from then on it was integrated into the area of Humanities in primary and secondary schools, at the university level geography was also present for several decades in the College of Sciences under such titles as Cosmography and earth Physics, geodesy, Phytography and Botanical Geography.

Thus, geography teaching in Spain in primary and secondary schools started in the middle of the last century. One could expect, therefore, that many chairs of geography should have been created in Spanish Universities and that the institutionalization of geography would have occurred at an early date. But it did not happen this way. The few chairs of geography that were created were subordinated to other curricula and were taken by teachers trained in other fields ; that was the case with mathematicians in the College of Sciences and historians in the College of Arts (Estébanez, 1982, p.31). In the latter, Historical Geography was initially taught but at the end of the century it changed to Political and Descriptive Geography. Geographers met a strong opposition from scientists from other fields (e.g. geologists, botanists, historians, and sociologists) when they tried to obtain positions of importance within the university syllabus. In spite of the steps taken by the «Real Sociedad Geográfica de Madrid» (created in 1876) in response to this situation, there was no significant change until the 1940s. Geographers were unable to influence the decisions of the «Ministerio de Fomento» as their scientific project was in competition with other projects. Thus, it is difficult to talk about the institutionalization of geography at the university level.

Academic geography- «la géographie des professeurs» in Lacoste's words (1976)- was almost non-existent until the 1940s. But things were different with the utilization of geographical knowledge and with the professional practice of geography outside of the university. Geographical knowledge was highly valued in a large number of non-academic circles, some of them mainly cultural in character but others of rather political or ideological nature (Gómez Mendoza & Ortega, 1986). In the first case, there was a close connection with the hiking movement from its beginning, specially on those regions where this movement had a strong nationalist flavour as was the case in Catalonia (Nogué-Font, 1991). In the second case, the contributions of geopolitical character- in the form of books, lectures made by geographers or other social scientists- should not be overlooked. They mainly refer to Spain's colonial problems or to the geostrategic position of the Iberian peninsula in the Mediterranean and the European context. Relevant examples are works like «Política de España en Africa» by Gonzalo de REPARAZ (1907), «Contribución al estudio de la península: Geografía militar de España by Díaz de Villegas (1936) or «España: Geopolítica del

Estado y del Imperio» by Vicens Vives (1940). It has to be pointed out that a strongly ideological and geopolitical discourse persisted during the first years of the Franco dictatorship- especially between 1940 and 1945- due to the close ideological connections between the Franco system and the German National-Socialist version.

Contradictory as it may seem, during this period the professional practice of geography in Spain showed a vitality- and at times a quality- that clearly contrasts with its low level of institutionalization in the universities. Catalonia is a good example because of the role played by geographers in the new territorial division implemented in that region in the 1930s (Lluch & Nello, 1984) as we will see later. It has often been asserted that if there is a Catalan school of geography, one of its most peculiar features is a very strong interest in regional planning (Cassasas,1979). It is important to point out that Catalan nationalism has always urged the abolition of the provincial division still existent today that was imposed by the Madrid government in 1833. In the different periods in which Catalonia gained and enjoyed some degree of political autonomy, geographers have been sought by regional governments to propose and implement alternative regional planning projects. This was the case in the period we are referring to and, in particular, during the Second Republic (1931-39).

In 1932, the Generalitat (the Catalan Government) asked the geographer Pau Vila (García Ramón and Nogué Font,1991) to prepare a project of territorial division. Pau Vila (who had never taught at the University) with a group of professionals (none of them university teachers) presented a radical project of territorial division that, for different reasons, was not implemented until 1936. Although Vila was considered a follower of the Vidalian tradition of regional geography, he designed a territorial division that was really very innovative for his time. The resulting 38 «comarques» («pays») were drawn on criteria not only based on physiographical or historical delimitations but mainly taking into account the market areas of the Catalan urban network of that time.

The work of Pau Vila is exceptional in its quality and modernity, but it must be pointed out that his contribution was not an isolated one. It was the highest point of a long and rich tradition of regional studies (studies of «comarques») that was broken by the political exile of many scientists following the Civil War (1936-39). Because of the work of Vila, a collective awareness emerged in Catalonia in the sense that the study and implementation of regional planning at different levels was the specific job of professional geographers- a type of professional who could not be found at the university. This lack of connection between professional practice and academic institutionalization of geography was to continue in Catalonia after 1940 as well as in the rest of Spain - but in opposite terms, that is with a growing academic institutionalization of geography and no professional practice outside the university.

GEOGRAPHY BETWEEN 1940 AND 1978. THE INSTITUTIONALIZATION OF GEOGRAPHICAL KNOWLEDGE IN THE UNIVERSITY.

Like other scientific disciplines, geography was badly hurt by Franco's dictatorship, first of all by the forced exile of a significant number of important

professionals (e.g. Miquel Santaló, Pau Vila, Gonzalo de Reparaz, Leonardo Martín Echevarría). The atmosphere of political repression and intellectual censorship of the post-war years, together with the exile of the above mentioned geographers, explains the sluggishness of the discipline in those decades. Nevertheless, several exceptions should be mentioned of geographers who were either too young or did not hold any relevant position before the war and were able to continue to work in Spain after 1939. This was the case of Dantín Cereceda, Armando Melón, Eloy Bullón, Manuel de Terán in Madrid and Lluís Solé Sabarís and Josep Iglesias in Barcelona.

Geography as an academic discipline, both at school and at the university level, was held in high esteem by the new political regime; nevertheless topics and approaches uncongenial with the dominant ideology were taken out of official syllabuses. But geography - in the same way as history- was conceived as a tool for the transmission of the nationalist ideology to reinforce the sense of unity of the country and to enhance the Spanish patriotic spirit. This was very similar to the role that many European programs of public instruction had played at the end of the 19th century.

Cut off from the analysis of certain topics of human geography and lacking a critical methodology, geography easily became an essentially descriptive and apolitical discipline. For this reason, the teaching of geography in primary and secondary schools was reinforced and it grew in importance (relative to other social sciences) in schools at the intermediate level (Schools of Commerce, and Teacher Training Colleges) and in the university. The presence of geography at the university level was more conspicuous in the College of Arts than in the College of Sciences, where it was only represented by one chair of physical geography. Last but not least, the Minister of Public Instruction from 1939 to 1951 was José Ibañez Martín, a former teacher of geography and history at the secondary level, who consistently gave support to the teaching of geography (Capel, 1976).

The institutionalization of geography in Spanish universities really became a fact after 1940, although, at the beginning, the scientific community of geographers grew at a very slow pace. Between 1940 and 1965 the number of geographers teaching at the university level increased slowly in parallel with the relatively low number of pupils at secondary schools (200,000 in 1945) and of university students too (40,000 in 1945 and slightly above 60,000 in 1960). For instance, in Spain in 1959 there were only eight full professors of geography in the Colleges of Arts and four more in the Colleges of Sciences (López Palomeque, et al. 1986). It was after the mid 1960s that the number of geographers teaching at the university level increased almost exponentially, a fact which is closely related to the impressive increase in the enrolment in secondary school (above one million in 1967) and to the astonishing rise in the number of university students- in particular in the College of Arts. In effect, the number of students in the Colleges of Arts increased from 17,000 in 1965 to 42,000 in 1970, almost 80,000 in 1975 and above 100,000 in 1980. The 1960s and the 1970's appear, then, as the decisive period for the consolidation of the geographic community in the university.

The spectacular increase in the number of university students was a key factor in the institutionalization of academic geography, now almost exclusively concen-

trated in the College of Arts (in many cases in the Faculty of Geography and History), where specific Departments of Geography appeared during the 1970s- a fact that would have been unthinkable a few years befo. Growth was impressive in every aspect that could be considered: the emergence of new departments, the number of students, the number of doctoral dissertations, the publication of new journals etc. For instance, before 1960, geography was present in the Spanish universities only through a dozen subjects, including those taught in the College of Sciences by geologists. As a matter of fact, in the College of Arts only three subjects were taught, that is «Geografía General», «Geografía de España» y «Geografía Descriptiva Mundial». But at the end of the 1970s and in the 1980s, about 150 different titles were taught in Spanish departamentos of geography, all of them located in the Colleges of Arts (López Palomeque, et al.1986, p.5). It is very important to point out that in 1974 a decree was passed that allowed the creation of departments wherever specific geography courses were taught; and this eventually led to the creation of specific curricula in geography in most universities. This formed the basis for the impressive increase in the number of students majoring in geography during 1970s and 1980s.

The case of the journals is most illustrative of this process of institutionalization. From 1940 up to 1964, only three specialized journals of geography existed, all of them being published outside of the university: *Boletín de la Real Sociedad Geográfica* (founded in 1876); *Estudios Geográficos* published since 1940 by the «Instituto Juan Sebastian Elcano» of the «Consejo Superior de Investigaciones Científicas»; and *Geographica*, which began publication in 1954, also by the «Consejo Superior de Investigaciones Científicas» at its branch in Zaragoza. It was not until 1964 that the first journal published by a university department of geography appeared- *Cuadernos de Geografía* at the University of Valencia. Between 1964 and 1978, another ten university journals began publication and fifteen were added after 1978. In sum, in Spain there are today 29 academic journals in geography, all of them founded -with only one exception- after 1940 and 24 of them created after 1964. They are vastly different in nature and some of them are published at irregular intervals; but almost all of them have in common that they are entirely dependent on one of the university Departments of Geography.

Apart from this tremendous upsurge of the institutionalization of geography in the Spanish university, a public center for specific geographical research was created as a branch of the «Consejo Superior de Investigaciones Científicas»- the above mentioned «Instituto Juan Sebastian Elcano» established in 1940. It played a fundamental role in the process we are examining since between 1940 and 1960, when Geography departments did not still exist, the Institute (with branches in Barcelona, Madrid and Zaragoza) was the only place where researchers could be trained. It had specialized libraries, granted awards every year to the best doctoral dissertation and research works, published relevant pieces of research and the above mentioned journal- *Estudios Geográficos* - and organized scientific meetings (Jaca in 1941; Granada in 1942; Santiago de Compostela in 1943; and Pamplona in 1944).

Once the teaching and research in geography was gradually institutionalized in Spanish universities after 1940, a parallel progress in the professional practice of geography might be expected. However, this did not happen. The professional

geographer was almost non-existent in Spain until after 1970. The Franco regime favoured the teaching of geography and, as a consequence, the profile of the geographer was as a professor and, to a lesser extent, as a researcher. It is clear that the system was not interested in favouring the profile of the geographer as a planner who is able to act in the field of regional planning. In part, this resulted from ignorance of this dimension of geography, but above all, from an aversion to any practical recognition of the need to implement the legal framework (rarely taken into account even when it existed) in regional planning and in resource management. In sum, the lack of any democratic control in the decision-making process led politicians in executive positions to disregard the contribution of professional like regional or urban planners. During this period only a few exceptions can be observed such as, for instance, Salvador Llobet who participated in the «Plan General de Ordenación de la Provincia de Barcelona» (1959), though his recommendations were scarcely followed. Also, José Manuel Casa Torres strongly favoured applied geography- although his idea of it was rather restrictive- and he created a Department of Applied Geography in Zaragoza and, later in Madrid, the «Instituto de Geografía Aplicada» within the «Consejo Superior de Investigaciones Científicas». In fact, he was a consultant for the elaboration of the well known Development Plans that signalled a new phase in the economic policy of the regime in the 1960s and early 1970s (Casas Torres, 1973).

Putting aside the above mentioned exceptions (and perhaps a few more), professional practice in geography was irrelevant until the 1970s; at the same time academic geography was clearly institutionalized. The promulgation of a democratic Constitution in 1978 was a turning point; it opened a new period in which the professional practice of geography received encouragement and expanded rapidly.

ACADEMIC INSTITUTIONALIZATION VERSUS PROFESSIONAL PRACTICE: SPANISH GEOGRAPHY BETWEEN 1978 AND 1990.

During the last thirteen years, the process of institutionalization of academic geography has continued, although at a much slower pace. Between 1978 and 1985 new journals appeared, new university Departments were created and the number of students in the College of Arts, and, consequently, in the sections of Geography increased or, in some cases, maintained their numbers. Around 1985 the process of academic institutionalization was completed. That year also marked a clear change in the hitherto expansionary trend. Neither new journals nor new departments (except for the cases of partition of big preexisting departments) were created that time, and the number of students in the Colleges of Arts began to diminished gradually. This was partly because no teaching positions were created in the secondary schools, which had been the most important outlet for graduates in the Colleges of Arts. The gradual marginalization of geography in the new syllabuses of secondary schools only aggravated this situation.

Precisely at this moment the professional practice of geography acquired an increasing relevance and a debate on this subject has arisen within the academic community of geographers (Oliva, 1984; Troitiño, 1984). For the first time in our history, we face a sort of confluence between the professional practice of

geography and its academic institutionalization which is clearly reflected, for instance, in the design of the new geography curricula that will be implemented in some universities in 1993. Another sign of the increasing presence of professional geographers, as opposed to academic geographers, is the creation of specific professional associations to take care of issues and interests rather different from those concerning academic geographers; a pioneer initiative has been that of the «Associació de Geògrafs Professionals de Catalunya», which has been very active in the recent past (Mateu, 1988).

Several reasons explained this upsurge in the professional practice of geography in Spain. The 1978 Constitution opened a political situation with great potential for the development of the professional practice of geography. The Constitution transformed a strongly centralized state into the «Estado de las Autonomías» with a largely decentralized political and administrative structure. Spain is nowadays divided into 17 autonomous regions («Comunidades Autonomas») to which powers have been transferred in fields as significant for professional geographers as urban and regional planning, environmental management, cartography and the like. After four decades of the marginalization of regional planning, autonomous governments needed studies in those fields and commissioned for the services of skilled professionals, among them the geographers. Some autonomous governments, the Catalan government for instance, recently included, the position of geographer among their civil servants for the first time (*Diari Oficial de la Generalitat de Catalunya*, 959, 29.02.1988, p.781).

It should also be mentioned that the new land use regulations («Ley del Suelo») give almost full jurisdiction in urban and regional planning to the municipal governments, and that the first free municipal elections after the Civil War were held in 1979. In just twelve years the new municipal governments have had to carry out duties that they had not done in the preceding forty years as far as urban planning was concerned. Although to a lesser extent than architects, economists and lawyers, geographers have taken professional advantage of this situation and many new graduates in geography are working for the municipal governments, either on a permanent or temporary basis.

A second reason that helps to explain this increase of the professional practice of geography in Spain is the country's entry in the E.E.C. Since 1986, Spain has been a full member of the Community which has meant that it has been necessary to adapt Spanish legislation gradually to the European one. An example that affects geographers is the Spanish regulation on environmental matters was almost non-existent, but the homogenization of E.E.C. legislation decrees that the environmental impact now has to be assessed before the implementation of urban and regional planning. This opens new professional prospects to geographers trained with the required skills. In addition to this, integration into the E.E.C. has also influenced the programs on regional development of marginal or depressed regions (mountain or border areas, deindustrializing regions, and the like). In sum, social awareness of regional planning problems, and of environmental issues in particular, has gradually increased in Spain in recent years, and this has created a new and greater demand for disciplines that in one way or another are concerned with geographical space.

A third reason for this blooming of professional geography is in the supply side. This situation coincided with an increasing number of graduate students in

geography who for the first time appeared in the job market as a result of the implementation of specific curricula of geography that followed the creation of geography departments after the 1974 decree. There was a real pressure for the creation of specific positions for geographers in the administration, and this allowed certain positions to be taken up by geographers and not by other professionals as had happened in the past. In part, this situation also explains the appearance of private consulting offices run by geographers who are taking advantage of the consolidation of a professional profile initially only to be found in the public administration.

One final reason to take into account for a fuller understanding of this process is more elusive but nonetheless deserves attention. It is the internal evolution of the discipline itself that has facilitated this blooming of applied geography that during the 1970s was held back by the reluctance of radical geographers to make any compromise with the established social order, as represented by governments at their different levels (Taylor, 1985; García-Ramón, 1988). On the one hand, radical geography has clearly lost ground within the community of geographers during the 1980s and, consequently, there seems to be much less concern with the political and social implications of the professional practice. On the other hand, we should point out that, in Spain, the nature of government has also substantially changed in this period when an authoritarian system gave way to a more participative and democratic one. This partly explains the willingness of, at least, a part of the geographical community to engage in a closer cooperation with the administration.

CONCLUSIONS

Only since 1978 have the academic insitutionalization of geography and the professional practice of the discipline followed parallel paths; and some kind of balance can be foreseen in the near future as is already the case in quite a few European countries. This is an entirely new situation in the history of Spanish geography. If it is true that before 1940 some outstanding cases of what could be called professional geography can be mentioned, geography was almost absent from Spanish universities. But, from 1940 to 1978, the situation was quite the reverse: academic geography acquired an unprecedented strength while applied professional geography almost disappeared.

It could be said then, that the present situation of Spanish geography is ideal since eventually a sort of balance seems to have been achieved between academic institutionalization and professional practice. However, it is our contention that several important challenges have to be faced in order to consolidate the accomplishments of recent years.

The first challenge is related to the training of new geographers in which a balance has to be achieved between theory and the more professional skills required in applied geography. In spite of what might be thought, Spanish geography has a heavy deficit in social theory and this is apparent not only in the university curricula but also in the research work. Good applied geography requires adequate training in many skills and techniques but must also be backed by a solid theoretical foundation that ensures coherence in the choice and use of these techniques. The current reform of university curricula provides academic

geographers the opportunity to meet this challenge successfully if we are able to design adequate curricula to train good professional geographers as well as researchers or secondary school teachers.

In relation to this, a second challenge is presented by the current changes in secondary school curricula that relegates geography to a very marginal position within an undifferentiated package of «Social Sciences». The absence of specific geographical subjects in secondary school threatens the prospects for the discipline at the university level as it will be much more difficult to recruit students in the future. This is clear from the experience of several countries, in particular the U.S.

A third challenge is, perhaps, the most difficult to meet. The social perception of the geographer's role has to be enhanced, not only by means of what we have called «applied geography» but also in fields in which geography is now poorly represented, like the editorial world. There are few books published by Spanish geographers and only a few foreign works are translated, if textbooks are not counted. Geography books take up little space on the bookshelves of Spanish bookshops, in clear contrast with other subjects in social sciences like history, sociology and even anthropology. A greater social prominence of geographers should not only be achieved through their participation in regional and urban planning but also- or even more- through the diffusion of their approaches and opinions on subjects that currently are of great concern for our society. Geographers have a great deal to say on subjects like the explosion of European nationalisms, the disintegration of the Eastern block, armed and political struggles, desertification, pollution and many many others.

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PART TWO

BASIC LINES OF RESEARCH

1. STUDIES OF THE HISTORY OF SPANISH GEOGRAPHY

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FEATURES OF THE HISTORICAL STUDIES OF GEOGRAPHY

Spanish Geography has shown a traditional concern for its own history (Bosque Maurel, 1984). Gonzalo de Reparaz's (1943) thorough and carefully researched reconstruction of the history of Geography in Spain, Amando Melón's numerous studies, with their particular focus on Humboldt's connections with Spain and Latin America, and some of the research carried out by José Gavira (1939), are among the best examples of this concern. This rich tradition has been maintained by the research completed in this field in the last twenty years, although the eighties have been more productive. Reference is made frequently to the same historical periods and to the same authors as in earlier research. However, the traditional interpretation of the history of Geography as a history of discoveries (Urteaga, 1987) has been abandoned, to be replaced by a concern for a more geographic interpretation with the use of different methods and techniques. In this respect, the history of Geography has undergone a significant conceptual and methodological renewal.

This review aims to guide the reader through more than 150 works, identifying research trends and programmes and interpreting their main findings. This has necessitated a selective approach and the omission of, insofar as it is possible, references to Historical Geography - a fruitful and popular field of research for Spanish geographers -, research into the history of Geography not carried out by geographers and those studies which have tried to reconstruct the whole or part of the history of the distinct branches of Geography, as in Geomorphology, Rural or Urban Geography. Here we shall be concerned only with the work of geographers who have written in a general nature about the history of Spanish Geography.

Firstly, concerns and questions generated by the research in this field during the last two decades must be discussed. The research programme led by Horacio Capel, to which we shall later return, is responsible for a voluminous collection of work which expounds a case for its acceptance within the history of science and the scientific community. The work considers the dilemma of continuity or change in the development of geographic ideas; before concluding that the history of modern geographic thought should be presented in terms of a recurring conflict between positivism and historicism, as proposed by Cassirer and von Wright amongst others, and attempts to illustrate this hypothesis with reference to Geomorphology (Capel, 1989, 29; Capel, 1983; Grau and López, 1984; Grau and Sala, 1982-83). The same group of researchers also share an institutional and socioprofessional perspective of the development of the scientific communities: the key to the development of the latter lies in the strategies carried out by the

members of the community to ensure their own scientific field with its own strong institutions. In this way, Geography would have survived the loss of its mathematical and astronomic branches, due to the pedagogic function it fulfilled in the 19th century. This had a decisive influence in its institutionalization in the universities and in the appearance and consolidation of a scientific community of geographers. This research programme has worked on the premise that the history of geographic thought can only be properly interpreted if we take into consideration, not only scientific ideas, but also the socioprofessional interests of geographers together with their somewhat complex, contradictory and conflictive relations with other competing scientific communities (Capel, 1980, 14-15), and has tried to documentate and ratify these ideas at various points in the process.

Along side this line of research, related to the sociology of science, are to be found others of a more «internal nature», as they have come to be labelled. Seen from this point of view, it would be necessary to reconstruct the development of current geographic concepts and problems, but also, and more importantly, the epistemological attitudes with which geographers faced these problems and the way in which they reasoned (Ortega Cantero, 1987, 28). Thus, this research aspires to both a concrete and subjective understanding of the very cognitive processes used by geographers at each step. This type of questioning underlies some of the historical research undertaken in the study of the introduction of the modern geographic tradition in Spain, among which is included the work of the Universidad Autónoma of Madrid (Gómez Mendoza and Ortega Cantero, eds., 1992).

In addition to these initial considerations, research into the history of Geography in the eighties shares another common concern: to recover the Spanish tradition following the massive adoption of methodological innovation in the 1970's, and thereby to confirm the scientific dimension and the specific nature of the Geography being undertaken in Spain. Referring to historical studies of Geography in Spain and Latin America, one author has even spoken of the «political dimension» of the research, insofar as it might contribute to reducing the inferiority complex experienced by the Spanish at certain times in their history over their inability to work scientifically (Capel, 1989, 32; Capel, 1987).

The formal situation of the historical study of Geography is ambiguous. There is a predominance of studies carried out by individuals, not as a part of a research programme, but as a complement to their main areas of research. There is one important exception, however: the team of researchers formed by Horacio Capel at the University of Barcelona, whose ideas are propagated in «Geocrítica». For Capel historical investigation has become the fundamental intellectual task, forming the basis of a copious arsenal of publications. The work carried out under his direction and inspiration forms a relatively coherent whole, constituting for almost twenty years a research programme with the same objectives (Capel, 1989), in spite of the rethinking of stand points and the swing in trends which form an inherent part of intellectual work. The research programme, «Territorio, Sociedad y Pensamiento Geográfico en España e Iberoamérica» (Land, Society and Geographic Thought in Spain and Latin America), is integrated into the programme promoted by the «Consejo Superior de Investigaciones Científicas» (CSIC) for scientific and cultural exchange between Spain and Latin America.

A further programme, financed by the «Comisión de Investigación Científica y Técnica» (CICYT), is that being undertaken by María Dolores Garcia Ramón and

Joan Nogué at the Universidad Autónoma in Barcelona, researching recent methodological innovation in Spanish Geography and, more specifically, foreign influences on this. The last forty years are being studied largely by means of bibliometric analysis and video taped interviews. Finally, at the Universidad Autónoma in Madrid, a team led by Josefina Gómez Mendoza and Nicolás Ortega Cantero, is investigating the introduction of the modern tradition in Spanish Geography from the middle of the 19th century, examining the complex and plural relations existing between Naturalism and Geography in the period from the Restoration in 1875 to the Spanish Civil War in 1936. Between 1987 and 1990 this programme was financed by the «Fundación del Banco Exterior de España» under the title «Naturalism and Geography in Spain from the middle of the 19th century until the Civil War». Ortega Cantero is also leading research into «Geographic Representations of Latin America» sponsored by CICYT (1989-1991).

However, as stated earlier, the work of these research programmes should not detract from the number of geographers working in this field on an individual basis, some with an exceptional consistency, as is the case of Antonio López Ontiveros at the University of Córdoba, Juan Vilá Valentí in Barcelona, Joaquín Bosque Maurel at the Complutense in Madrid and Francisco Quirós Linares in Oviedo. Occasional collections of papers have temporarily brought together authors from different universities and fields of research, as in the early study of Roman Centuriations in Spain (Rosselló, 1974), and as is happening now with the reissue by province of the general replies of the Catastro de Ensenada (mid-18th century land register). More recently, these collections have been published in tribute to or in memory of distinguished geographers, revealing thereby the important rôles played in the history of Spanish and Catalan Geography by Manuel de Terán Alvarez, Luis Solé Sabaris and Pau Vila i Dinares. The reissue of certain classics is in itself a good opportunity, albeit of varying significance, for introductory research though, in general, of a bibliographic nature. The naturalist Cavanilles is a good example of this (Mateu, 1991). The incorporation of certain Spanish researchers into the Commission for the History of Geography and Geographic Thought of the International Geographical Union (IGU) and into the International Union for the History and the Philosophy of Science (IUHPS) has meant that they have been able to report at the scientific meetings of the Commission the results that they have obtained in their work. The overall result has been the recent appearance of biobibliographic studies of Spanish Geographers in the journal «Geographers» (Marti-Henneberg, 1985; Mollá, 1986; García Ballesteros, 1987; Riudor, 1988; García Ramón y Nogué, 1991a; Rodríguez Esteban, 1991).

The research methods used closely reflect the issues earlier identified as being at the centre of current debate and at the heart of recent research programmes. Those taking a more sociological approach to the history of Geography and its related fields have preferred to catalogue authors and their works, establish proper chronologies, determine the institutional structure and the processes used in selecting and appointing the technical staff and the scientific community and to apply various quantitative indices of a bibliometric nature, in preparation for the latter prosopographic analysis (Capel, 1989 40; Capel et al. 1988b, 9; García Ramón, 1988). On the other hand, those who study geographic ideas and reasoning and epistemological attitudes seek, above all, an understanding of the

author's work and the intellectual and scientific environment in which it was carried out. This involves them in an in depth reading, a comparison and contextualization of significant works, and a resort to extensive quotation, in attempting to let the author speak for himself, while supplying the appropriate references. The results are an attempt to interpret the intellectual development of authors, episodes, questions and problems. Neither iconographic nor lexicographic analyses have yet to be attempted, but neither has their eventual use been discounted (Capel, 1989, 52). However, the use of personal video taped interviews has been used in researching the most recent aspects of geographic thought in Spain (García Ramón and Nogué, 1989).

Few works of a global nature were produced in this period under review. Vilá Valentí (1989a) offers the most general picture of Spanish geographers and geographic research. In a publication aimed at a wide audience, he outlines how our present knowledge of the geography of Spain has developed, by reviewing the ways in which Spain has been described, by analysing conceptual and terminological problems since the Renaissance, and by reexamining geographic texts, etc. Somewhat before the period under review, Enric Lluch had attempted to assess the modern Catalan school of Geography (Lluch, 1961). In a discussion of general texts, it is worth remembering the study carried out by Jesús García Fernández of the history of the region of Castile. He expounds, in an unorthodox manner, as much for its political dimension as for its historiographic and geographic approach, how a continuous perception of the unity of Castile since medieval times, based on her most impressive physiognomic feature, «las llanuras» (the plains) is contrasted with a scholarly tradition, albeit of a small minority, which dates from the 16th century and distinguishes two historic regions, Castile and León. This latter tradition has, however, recently acquired wide acceptance (García Fernández, 1985).

The above are examples of the few publications existing which examine history of Geography in a global way, be it from the reexamination of distinct issues, or from the perspective of a school of thought, or a regional interpretation. In the last twenty years the study of more limited periods and concrete issues has been more usual. These studies go back at most, with some exceptions, to the Geography of the Renaissance; though two major periods of emphasis exist: the 19th century and the last fifty years. It would therefore appear to be appropriate to attempt a more detailed presentation of the historiographical production of Spanish Geography according to the distribution of research in three periods: from the Renaissance to the 18th century, the 19th century and the 20th century up to the Civil War and, finally, the last five decades.

RESEARCH INTO PERIODS EARLIER THAN THE 19th CENTURY

The historiographic concern of Spanish researchers in the last twenty years has concentrated, above all, on the period from the 19th century to the present day, opting, therefore for what Capel has called a short chronology. The exception has been the collection of work produced by the University of Barcelona and, especially, Capel's own work. The latter has described how his initial enquiries in the second half of the 1970's into the corporate behaviour of contemporary geographers (Capel, 1976, 1977) led him to formulate a series of enquiries to a period prior to the 19th century. Capel outlines the path his research took him

along: from contemporary Geography to that of the 18th century; from here to the branches of Geography, including those of Physical Geography, in the same period; from here to the theories of the earth's physical structure and the philosophical undercurrents which influenced them; and finally from here to the influence of religious beliefs on the development of Geology (Capel, 1989, 64). It is an attempt at the definitive reconstruction of the history of Geography from the Renaissance and the scientific revolution to the present day, «taking into account that the modern age is essential in the modification of the content of the discipline of Geography and that the changes undergone since the classical age may be considered (because of the problems raised) insignificant» (Ibid, 33).

The first question to be analysed is that of the introduction into Spain of the scientific revolution by the «novadores» (innovators) - mainly Valencians and Madrilénians - discussed in the work carried out by historians of science such as José Luis Peset (1974), Víctor Navarro Brotons (1974) and José M. López Piñero (1969, 1979). One of the latter's theories is that this introduction might have proved an excessive price to pay, representing a break from the Spanish scientific tradition. On investigating the tension between Platonism and Organicism on the one hand and between religious beliefs and scientific theories on the other, in Geographic and Geological theories about the earth's internal structure, Capel has discovered the persistence of ancient scientific explanations, old myths, and, consequently, a continuity which would deny, or at least reduce the significance of, the breakaway theories (Capel, 1980, 1982b, 1985). This is not to deny the influence that works such as «Mundus Subterraneus» by Kircher had in Spain, a true geocosmic view of the 17th century (Sierra, 1981). However, it is recognised that the development of geological thought cannot be understood without taking into account the philosophical and theological debates of the modern age (Capel, 1980).

Related to this, but occurring somewhat later, Capel himself has maintained that, especially, from the time of the changes in university curricula in mathematics, nautical studies and the first reorganisation in cartography, Geography, which since the Renaissance had been a physical-mathematical science associated with the resolution of the problems of the scientific revolution, became excluded, as the culmination of a process which had developed throughout the 18th century, from mathematical disciplines and became to be identified as an encyclopaedic and descriptive study of the countries of the world (Capel, 1980, 1981, 1982a, 1988). This theory of the transformation of Geography into a descriptive discipline is at the heart of the geographic historiography of the Barcelona school and is clearly reflected, as we shall see, in its interpretation of the 19th century. Vilá Valentí has recently suggested that the Enlightenment would have entailed a break in the prevailing chorographic thought (Vilá, 1989b).

However, to continue along the path taken by Capel and his followers, these latter considerations awoke their interest in other 18th century professional bodies; cartographers, sailors, and above all, military engineers. In the members of this latter body they have identified the authors of an outstanding spatial contribution in the form of important territorial analyses and geographic descriptions (Capel et al. 1983; Capel et al., 1988a; Sánchez, 1987). The research carried out so far has involved the systematic inventory, and analysis of the

institutional structure of the military engineers, their sociological makeup and the scientific training of their members. An analysis of the scientific production and the spatial interventions of the military engineers remains to be known. It is worthy of note that the incorporation of Omar Moncada into the team has meant an increased understanding of the Mexican situation (Capel et al., 1988a).

Certain other questions posed by Capel in his earlier studies have been the object of analysis in an understanding of the 18th century. For instance, the dichotomy - optimism-pessimism - in the consideration of Nature (Capel, 1985) which has its origin in a history of conservationist ideas which Luis Urteaga traces back to enlightened rationality, although recognising, in general, the predominance, at that time, of the idea of progress and an optimistic conception of natural resources and their exploitation by man (Urteaga, 1984 and 1987). Thus, in this author's interpretation there can be seen a contradiction between a strong optimism over man's ability to transform Nature and contradictory assertions over the delicacy of the natural equilibrium and the depredatory capacity of human action.

The major Bourbon reforms; territorial organization and tax unification and reform provide the main source of 18th century documentation, most notably the Catastro de Ensenada and the Tomás López map. Their importance is reflected in their wide use by geographers and the new attention they are receiving in historiographic research (Camarero, 1987). Indeed, the recent initiative to publish by province the general replies of the Catastro del Marqués de la Ensenada might be a good opportunity to recover for geographic use the state of territorial districts in the middle of the 18th century (López Ontiveros, 1990). The same applies to travel literature (Mateu, 1983, 1991) and the scientific findings of the overseas expeditions during the Age of Enlightenment. Finally, the dictionaries of the Spanish Enlightenment (Capel, 1981b), geographic and historical descriptions of the kingdoms and provinces, which were a prelude to the great ventures of a similar nature a century later, are worthy of major consideration.

As can be seen, studies in this section have focused largely on the 18th century; yet, this should not obscure other developments. We have already mentioned the research carried out by Vicenç Rosselló and other authors at the University of Valencia into Roman Centuriations (Rosselló, 1974). Thus reflecting this author's concern to explore the possibilities for collaboration in Spain between Geography and Archaeology (Rosselló, 1987a). The same geographer has also become interested in studying the contribution of those who have chronicled the Valencian world in different ages (Rosselló, 1988, 1990). This has led to a recognition of the importance of the work of the great naturalist, Cavanilles (Rosselló, 1980, 1984). Antonio López Gómez, of the Universidad Autónoma in Madrid, but formerly at the University of Valencia, has also been concerned with the work of the ancient chroniclers in an effort to establish the state of Valencian agriculture in the second half of the 16th century (López Gómez, 1981).

RESEARCH INTO THE 19th CENTURY AND THE FIRST THIRD OF THE 20th CENTURY

There are two main reasons for renewed interest in the 19th century and the early decades of this century. On the one hand, the last century saw the acceptance

of Geography into the different levels of the education system in accordance with liberal-bourgeois education reform, thereby producing the so-called academic institutionalisation of Geography. This particular aspect has been, above all, of interest to various authors at the University of Barcelona working with Capel. On the other hand, this period witnessed the introduction of the modern geographic tradition into Spain, together with a considerable geographic dimension, in its diverse and often subtle manifestations, adopted by Spanish culture, and by scientific, technical and even administrative thought. These latter issues have stimulated a diversity of enquiries and research although some trends within this can be identified.

Taking the first of these; the theory remains that after the process of specialization begun in the 18th century and becoming more evident in the 19th (see the previous section), Geography could have disappeared and its functions could have been integrated into other sciences (such as Geology and Cosmology etc.); and that this did not happen is due, above all, to reasons of education, that is the presence of Geography in teaching with clearly defined educational functions and scientific disclosure (Capel, 1989, 50; Capel, 1977). Hence the interest shown in clarifying the presence and the functions of Geography in the Spanish education system and, above all, in elementary education, and consequently the relation between this geographic historiography and the history of education. Thus, the organization of teaching at different levels and the role of Geography in them has been studied (by reviewing curricula, recompiling text books, applying quantitative measures, etc.), as well as the influence of pedagogical ideas on the teaching of Geography and on the structure and content of text books (Capel et al., 1988b; Luis, 1985). This has been achieved by researching the teaching of Geography in the Escuelas Normales (centres training teachers of primary education) (Melcón, 1989, a and b), entrance requirements to the training body of Geography teachers (Sánchez Pérez, 1981) and the production of geographic publications destined for educational centres (Capel et al., 1988b).

Certain aspects of the initial hypothesis regarding the relation between the teaching of geography and bourgeois reformism have disturbed these researchers: in the first place, despite the insistence of the consolidation of the divorce between Geography and Mathematics and in the consequent redefinition of the geographic discipline, that this separation should take so long to be reflected at elementary levels, given that the general understanding about the structure of the universe and the earth continued to be taught through Geography manuals; secondly, the considerable delay in the introduction of Geography as a compulsory subject in the Spanish education system, remaining tied to History during nearly all of the 19th century. Finally, the innovative nature of the pedagogy of certain geographers, the teachers of the Escuelas Normales, and more specifically of Rafael Torres Campos, has also been recognised by other schools and perspectives, in relation to their links with the Institución Libre de Enseñanza (Rodríguez Esteban, 1988 and 1991). Bosque Maurel has shown that Spanish geography in our century began to develop before the Civil War, both in quality and quantity; but that this development took place not in the universities, but rather in the Escuelas Normales and in the Institutos of secondary education (Bosque, 1990). Vilá Valentí has called this the «pedagogic route» as opposed to the «naturalist route» taken by modern Spanish Geography.

The second aspect, of a more general nature, is related to the complex of enquiries regarding the presence of Geography (and of geographic interpretations) in Spanish scientific development from 1875 until the outbreak of the war (Suárez de Vivero, 1983). In this respect, the collected research brought together in one volume of naturalist and geographic thought (Gómez Mendoza, Ortega Cantero et al., 1992) attempts to show to what extent the renewal of modern geography in Spain went through its naturalist orientation as much for those aspects incorporated from the modern geographic tradition as for its joining of interests and research (including the merger at times) with naturalist authors of various origins. So that the first modern Geography in Spain would have followed two routes of development: one more specifically naturalist and the other, no less naturalist but more Ritterian, in its application of the bases of natural order to the study of History. It is worthy of note the rôle played in this modernisation by the Institución Libre de Enseñanza (ILE) and, later, and with even greater impetus, by the Junta para Ampliación de Estudios e Investigaciones Científicas (JAEIC), an institute which was active in the first decades of the 20th century in promoting the development of science in Spain in close connection with European and American science (Ortega Cantero, 1986; 1988 and 1991), only for its work to be brought to an abrupt halt by the Civil War and the emmigration of its most prominent members.

But this hypothesis transcends the delimitation - albeit weak and diffuse - of the field of Geography. Various naturalists and professionals widely trained in naturalism, such as foresters, show themselves to be aware of the specific Spanish geography, using foreign innovations in performing a modern science in their own fields, though remaining so attent to the Spanish reality, - what Manuel de Terán called the geographic genius of the Iberian Peninsula - that they finish by reasoning in geographic terms, as in Geobotany - general and forest - Zoogeography and even Geology (Sanz Herráiz, 1992; Gómez Mendoza, 1992; Blázquez, 1992). Earlier works had previously identified this interrelation of knowledge (Solé, 1941; López Ontiveros, 1982; Martí Henneberg, 1983; Mollá, 1986).

The geographic nature of 19th century thought and of the regenerationist age does not end here. It has other manifestations which have been emphasised in various works: in polytology, anthropology and sociology (López Gómez, 1978; López Ontiveros, 1984; Urteaga, 1985); in major land policies, as in hydraulics and forestry, which were based on a careful consideration of which part of Spanish problems (poor distribution of rainfall due to relief structure) and the proposed solutions were geographic (Ortega Cantero, 1984; Gómez Mendoza and Ortega Cantero, 1988 and 1992); in the creation of environmental policies and the protection of nature (Gómez Mendoza, 1991; Mata, 1991); in the founding of the first scientific excursion and climbing clubs (Martí-Henneberg, 1986; Mollá, 1991); in the new colonial project at the end of the century assuming the necessity of geographic knowledge to improve efficiency (Llorente, 1987 and 1988); and, in the history of certain scientific concepts (García Fernández, 1990; Vilá Valentí, 1991).

The great geographic, cartographic and statistical discoveries and the great decisions of territorial organization during the 19th century are currently the subject of geographic review. In the first of these cases, two related geographic

works stand out as the best expression of the renewing spirit of the 19th century liberal bourgeois: Pascual Madoz's «Diccionario Geográfico-Estadístico-Histórico», and Francisco Coello's «Atlas», both of which describe Spain and her Overseas Possessions. Francisco Quirós has recently proposed a global and systematic reading of Madoz in order to present a picture of Spanish cities in the middle of the 19th century, at the time when the effects of the first industrial revolution and the liberal political system began to manifest themselves and thus to provide support to Coello's cartography (Quirós, 1991). We have already mentioned the provincial reissue of Madoz's Dictionary. Furthermore, the cartographic work of the Instituto Geográfico Nacional is now being researched and, more specifically, the drawing of the National Topographic Map (Nadal and Urteaga, 1990), within a line of study which connects bourgeois reform with the territorial administrative patterns (Nadal, 1985, 1986, 1987).

Detailed research of the provincial organization in 1833 has yet to be made, but would be of major importance for a geographic interpretation of the modern history of Spain. On the other hand, Catalan geographers have stressed the rôle of Pau Vila in the territorial division of Catalonia undertaken by the Generalidad (autonomous government) in 1932, of interest for the delimitation of areas («comarques») founded not only on physiographic or historical criteria but also on market service areas (Casassas, 1979; Lluch and Nelo, 1984). The issue is related to the territorial nature of Catalan nationalism, also the subject of current research (Nogué, 1991).

The Geographic Societies and Institutes have shared the attention of researchers seeking their historiographic recovery and a renewed interpretation of their work. The Real Sociedad Geográfica, founded in 1876 as the Sociedad Geográfica de Madrid, is being studied in detail; the development of its activities, the origin of its members, and its connection with colonial thinking at the end of the century and pedagogic reform, and its ambiguous relations with the introduction of modern Geography (Rodríguez Esteban, 1991; Vilá, 1977; Mollá, 1985). The rôle of the Sociedad Catalana de Geografía seems to have been of greater relevance in earlier times, particularly during the Republic, but was to collapse in the first years of the Franco dictatorship («the years of the catacombs» according to Solé) only to reestablish itself in the sixties under the protection of the Instituto de Estudios Catalanes (Solé, 1985). In turn the Junta para Ampliación de Estudios e Investigaciones Científicas fulfilled a relevant rôle in the first decades of the 20th century, by providing scholarships abroad, which allowed a direct knowledge of the evolution of the more dynamic European geographic science (Ortega Cantero, 1991).

The Junta specifically patronized the geographic study of Spanish regions and landscapes, and in this sense helped to renew the vision provided by the traveller and to modify the meaning behind the experience of travelling. This aspect studied by Ortega Cantero (1988) is incorporated into the concern shown by Spanish scholars to understand the contribution and the geographic meaning of travel literature at different moments of the period to which we refer. Many authors have looked at these aspects, most notably; Nicolás Ortega Cantero on the whole Spanish landscape described by the romantic travellers, Lopéz Ontiveros on the Andalusia as seen by the same travellers and on the unexplored Spain whose explorers included great English Naturalists such as Chapman and

Buck (López Ontiveros, 1989); the pictures of romantic and liberal Madrid traced by Brandis (1988); and the relation between literature and geography which Zulueta has untangled in the works of the generation of writers of '98 as a product of their travelling vocation (1988).

Finally, there remains one last question which has aroused the interest of specialists in latter years: medical literature which relates health and disease with environmental factors. At the end of the 19th century there was a proliferation of medical topographies, until interest diminished due to the bacteriological revolution. In the relation between medical topographies and Geography, Luis Urteaga has identified three spatial concepts of disease: characteristics of place (above all climatic) which would favour certain epidemics; miasmatic and malignant emanations from determined locations such as marshland or certain urban areas; and social phenomena such as overcrowding and poverty which would increase the miasmatic risks (Urteaga, 1980; López Ontiveros, 1986). Thus, the geographic interest for medical literature and from this the relation which has been established between hygiene and environmentalism (Urteaga, 1985).

RESEARCH INTO THE LAST FIFTY YEARS AND THE SPANISH SCHOOL OF GEOGRAPHY

As has been shown in the previous section, certain key points in the interpretation of the modernization of Geography in Spain up to the Civil War have begun to make themselves apparent. In recent years, the number of studies attempting to extend these lines of interpretation to include present day Geography have been numerous. However, the review which has been made so far is incomplete and fragmentary and its interpretations too general due to the very complexity and lack of perspective on recent events. Initial conclusions which might be drawn can be resumed in the three following points.

Firstly, the relation between the evolution of postwar Spanish Geography and certain distinguished university geographers is well-known. Among the most noteworthy are Manuel de Terán and Solé Sabarís, and - for partly different reasons - José Manuel Casas Torres, all of whom are linked, moreover, to the Instituto Juan Sebastian Elcano of CSIC. The recent deaths of Terán and Solé have provided the opportunity not only to review their work and intellectual growth (as has been done with other authors) but also to reflect on what they have represented in the maturation of geographic thought in Spain (Cabo, 1987 and 1988; García Ballesteros, 1981, 1987; Gómez Mendoza, 1987; López Gómez, 1987; Martínez de Pison, 1987; Riudor, 1988; Vilá, 1986). The similarities shared by both authors have been recognised; the conscience from a shared liberal and humanistic tradition, and their faithfulness to geographic criteria (Ortega, 1991). It is evident that they did not break with the naturalist and landscapist tradition of the previous age. On the contrary, while Solé contributed to a renewal of Geomorphology, Terán continued to be aware of nature, not as a rhetorical resource but conferring on it all its weight within geographic reasoning. But, at the same time, it seems right to believe, in terms of initial studies made, that to Terán belongs the first true human inflection of Spanish Geography, the introduction into geographic discourse, as an explanatory factor, of the dynamism of human and social groups.

A second consideration linked to the leading rôles played by Terán, Solé and Casas Torres, is the dominating influence, beginning in the 50s, of French Geography represented by the Vidal School and, as a consequence, of a regional and landscape perspective (Vilá, 1984; Riudor, 1989; Solé, 1985). Although the events need to be studied more thoroughly, the influence of the modern French tradition and the progressive rejection of the German influence are slowly being revealed. The relations between certain Spanish universities and Institutes of Geography with the Institutes and Departments of Grenoble, Bordeaux and Toulouse, the encouragement given to Geography by Deffontaine head of the «Instituto Francés» in Barcelona after the war, the presence of such renowned geographers as Birot, Faucher, De Martonne, Sermet and Blanchard in Spain, the exchanges made with French centres by young researchers and Spanish teachers, the translation of some of the great works of French Geography and the accurate review of a large part of recent publications in the Spanish journals, «Estudios Geográficos», «Pirineos» and «Geographica» are just some of the ways in which the dominance of the French influence was established.

Related to the first manifestations of this influence, at a time before the war, some authors, above all the Catalans, had tried to adapt the Vidalian method to regional studies, as interpreted by Lucien Febvre, believing in man's active adaptation to the environment (Riudor, 1989, 23). However, the regional monograph was not to take root until a systematic study of the Spanish geographical reality was undertaken from a modern perspective, that is in the mid 50s and especially in the 60s. Doctoral theses undertook studies of regions or «comarcas»; while undergraduate dissertations concentrated on the municipalities. The few authors who have so far proposed an interpretation believe that an evolved or reformed regional model was followed, centred more on concrete and fundamental aspects than on a regional synthesis and therefore more atuned with the evolution of French Geography (Riudor, 1989; Vilá, 1984). According to Riudor it is the larger syntheses of Spanish Geography which have maintained a greater faith with the initial Vidalian idea attempting to identify the basic units and to reconstruct the mosaic. Be that as it may, this hypothesis, as can be seen, is concerned with profound issues and requires an extremely detailed and careful study. The research mentioned has begun to follow a highly interesting path.

Finally, research into the introduction of new geographies, at the end of the seventies, has so far largely been undertaken using bibliometric analyses (García Ramón, Belil and Clos, 1988; García Ramón and Nogué, 1989). The new interest in Geography from the English speaking world is apparent; although, it is not possible to be precise about the degree or rate of displacement experienced by French regional geography. It is equally apparent that, in this transition, Spanish geographers paid more attention to theoretical rudiments than to empirical work. Moreover, the acceptance and imitation of foreign interpretations of the geographical task was greater than in those earlier periods, reviewed here in their incipient historiography, in which furthermore an attempt was made to present a Spanish interpretation of new ways of thinking.

A degree of agreement seems to have been reached on this central issue regarding recent developments, but there are related questions which are arousing the interest of several researchers. We shall mention here, in relation to the work published, firstly, the fortune experienced by Political Geography in the early

years of Franco; its detachment from university Geography and its present day reassimilation (Bosque Sendra, 1987; Bosque Sendra and García Ballesteros, 1985; García Ballesteros, Bosque Maurel and Bosque Sendra, 1988). Secondly, on examining the relations between the professional practice of Geography and academic Geography, some of the reasons which might help to explain the considerable estrangement between both parties in the 50s and 60s and their present day closeness have been suggested (García Ramón and Nogué, 1991b).

We have tried here to present as complete a picture as possible of the historical studies of Spanish Geography carried out in the last twenty years. The distinct ways of thinking with their differing complexities justify, or at least explain, the uneven attention, in some cases the mere mention, we have been able to give them. Yet this is an unavoidable difficulty when endeavouring to present the state of the art. We trust in having been able to convey some of the richness of enquiry present in the renewed Spanish historiography.

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2. THE GEOGRAPHICAL CONTRIBUTION TO SPANISH GEOMORPHOLOGY

E. MARTÍNEZ DE PISÓN

«... modern researchers, who study the Physical World, not in their lodgings or rooms, but in the mountains, on the plains, in the forests, in the rivers, in the sea, investigating nature itself...»

P.B.J. Feijóo: Teatro Critico (1726-39)

THE ROOTS

In 1775 Bowles wrote in his «Geografía Física de España», «My work consists of facts and explanations. The former will always be true, although the latter will one day cease to be so». Nevertheless, in this first Physical Geography of Spain are to be found the fluvialist theories which were to provide the initial bases, in the 18th century, for what might be termed «morphogenetics», from which would be derived later the geomorphological system - the normal erosion cycle.

In the same year in which D'Arcet gave his famous lecture on fluvialism to the College de France (Martinez de Pison, 1975 and 1991), Bowles did not hesitate in attributing the form of the valleys to river erosion, in part maybe because of vague influences from Buffon but largely due to his own experience; «It can clearly be seen,» he wrote, «that the river has made way for itself through the rocks, by eating them away.» And elsewhere, «...the large valley, which has not been formed by a sinking of the land; because for this to be so; the lower strata would be like the upper ones; and the opposite is the case, the lower strata on one side are parallel to those on the other; from which it can be inferred, that it is the water which has eroded this land, sweeping away the earth.» «It is evident that the section of the valley which has been left empty formed a part of the same extended mass as the valley slopes». He even describes the process within the general tradition, as did D'Arcet, which was a prelude to the system, «It is evident that the hills have been formed by rain water... and that all this land has been flat; those parts which are without valleys, have a hard rock base, so as the water starts to wash over them the gulleys begin to form. I have seen some in these first stages, indicating that within twenty years a hill will have formed. Thus, it can be inferred that if there are mountains which are being destroyed and converted into plains, there are also plains which are being converted into mountains».

The valleys around Madrid led him to seek the cause of their origin in «the imperceptible degradation of the rocks,...the rapid flow of the streams, the heavy rain falls which transport and sweep away the earth, the underground springs which hollow out the ground», causes which considered together «are more than sufficient to create a country of hills and valleys; and if one realizes the effects of a spring or stream, however small it might be, ... one will see in a few years that it has eaten and carved out the ground to such a degree to form a valley ...

in some places the rock is still quite strong, but one can see how it is transformed from one state to another, that is from stone to gravel, sand or soil». «As these stones (smooth and rounded) are to be found in great abundance in nearly all river beds, it is very easy to conclude that the waters transport them and in the process they are rolled along and become smooth...I have believed this to be so all my life».

However, the terraces of the Tagus, suspended above the river bed and today immobile, made him question their fluvial origin. He examined different examples, which led him to the same conclusion, «I do not know», he confessed, «with what hypothesis nor with what chronology it is possible to imagine that any river has run across a summit of this height». Nevertheless, during his fieldwork he had witnessed pebbles being rolled along «by the water of the streams in the floods and storms»; «...the pebbles lie on highly inclined ground, their own weight induces them to roll, the water adds to their weight, and carries the earth which binds and holds them together in the bed, forcing them to move until they reach a place where they come to rest through their own natural weight and location». But the observant Bowles thought only in the remobilization of the terrace deposits (the origin of which he did not believe to be fluvial) as the only way of supplying these pebbles, and thus remained on the threshold of unearthing the geomorphological truths which later would be developed (Bowles, 1775).

When Cavanilles published his «Observaciones» in 1795, he had previously attended classes with D'Arcet and it is evident that he had also read both Bowles and Buffon. Thus, although he reasons as a fluvialist, occasionally he is influenced by the teaching of the great French naturalist (Mateu, 1980 and 1983). The influence of Bowles is apparent in his description of the now widespread ideas regarding the relief formation of the plains - shared also by D'Arcet - («the destruction continues, and no doubt it will continue until everything remains flat», wrote Cavanilles) and in his reasoning («the mountains, today separated, were joined in a previous age ...»). Elsewhere the influence of D'Arcet is apparent when he differentiates between «ordinary» and «extraordinary» causes of erosion, and even the ideas of Buffon are evident when he somewhat contradictorily states: «the mountains formed on the sea beds, and furrows were opened wide by the currents...». But even this observation inevitably leads him back to fluvialism: «the rain began to furrow the recently formed land, and to rob it of its soil marking out the first lines, which in time would become the river channels... until at last they excavated the valley that today lies ~~between~~ on the mountains»; «from which as much loam, soil, and pebbles that could be removed was all swept along» (Mateu, Ibid). In this way, he concludes «the form of the mountains changes». Therefore before the end of the 18th century, at least, the geomorphological concern in modern Spanish geography had been clearly stated.

At the turn of the 18th century and the beginning of the 19th, the travels undertaken by foreign naturalists throughout Spanish territory, such as Ramond's travels in the Pyrenees and Humboldt's in the Teide - and somewhat later those undertaken by Von Buch - led to an increase in the rigour and precision of the observations made on Spanish landforms at the local level, extending their observations to other elements, characteristic of mountains (such as glaciers) and volcanoes. The contributions made by Ramond and Humboldt might be considered geographic while those of Von Buch geological, but it was not until much

later that Spanish work was to appear in either of these two fields which would contribute to an understanding of the landforms. Undoubtedly, the naturalists of the 19th century promoted the geographic aspects of the Natural Sciences, and their overlapping interests (Sanz Herraiz, 1989), but, in general, they ignored the geomorphological aspects. The drawing of the geological map, on the one hand, and the writing of the «Memorias», on the other, gave rise, however, to a certain basic cartographic interest, and to some detailed descriptions of what could be called the Physical Geography of the Peninsula, which, although not containing any explicit morphological analyses, represented a clear advance on the existing state of information (Blázquez, 1991).

Against this background, however, several significant contributions do stand out. Amongst which is the work of Casiano de Prado, a geomorphological essay, «Descripción Física y Geológica de la Provincia de Madrid», published in 1864, in which he presents a classification of granitic forms, using a Spanish terminology which would be worth recovering today. He distinguishes the forms derived from upheaval from those produced by denudation. Moreover, he introduced a rich Castilian nomenclature (e.g. formas rectas, curvas, recortadas, llanas, en depresión, cabezos, cerrillos, berruecos, riscos, lanchas, cantos redondeados and angulosos, fisuras, tolmos, tolmeras, placas, prismas, pirámides, canchos, etc.) which could easily, without any loss of scientific rigour, replace the English expressions in widespread use among Spanish geomorphologists today. The detailed analytical descriptions of granitic forms and the study of the decomposition of granite, its derived shapes and relief, particularly in La Pedriza de Manzanares, according to the crystals, the fracture, the surface area, and the shapes of the kettle holes and the pillars, among many other aspects make this essay one of the first Spanish lithomorphological monographs. In the same way, his studies of what might be glacial phenomena in the Sierra de Guadamarra are indicative of the morphological interests of Casiano de Prado; while on the other hand, his enthusiasm for «physical description» is indicative of the author's geographic approach, which means that we can, at least partially, include him here among those contributions made to geomorphology. (Prado, 1864).

The 7th Volume of the «Memorias» of the Instituto Geológico, dedicated to Pliocene, Diluvial and Alluvial Systems, written by Mallada and published in 1911, shows the limitations of the information gathered in Spain at the start of the present century related to glacial morphology; however, there had already been contributions in this field by a certain number of authors, such as Baysse-lance, Cortázar, Drasche, Hernández-Pacheco, Macpherson, Mallada, Mazarredo, Penck, Prado, Quiroga; Schimper, Schrader: taken together their work comprises a disperse collection of observations which indicate, at least, the existence of glacial phenomena in the mountains of the Iberian Peninsula and the birth of a field of research, which should also be included in the foundations of Spanish geomorphology, although they are only partially geographic in nature.

As a direct result of the incorporation of the first global essays of geomorphology by Davis and Penck, Torres Campos was to write a significant and meticulous review of the 6th International Conference of the Geographic Sciences, held in London in 1895. The review includes a chapter entitled «The Morphology of the Earth's Surface», thereby deliberately echoing the paper delivered at the conference by Penck. Torres Campos points out that Geography is systematically

drawing nearer to an understanding of nature through its physical branch and one of the concerns of the latter is «morphology», which «characterizes and classifies the forms of the earth's surface according to natural factors». These forms are derived from an evolutionary process, from the repercussions of internal structures. «Thus morphology encompasses within its definition landforms and their creation». Torres Campos goes on to state that in the United States this study had become known as «Geomorphology». This probably represents one of the first occasions in which the term «Geomorfología» was used in Castilian and was described with such precision in the Spanish scientific world, attributing it specifically to Physical Geography. Torres Campos mentions the founders of the science who by this time already formed a large group. In Spain do exist works «inspired in the same tradition» by Vilanova, Botella, Macpherson, and Linares. Penck's systematization included here is in itself highly interesting and the author has commented on it elsewhere (Martínez de Pisón, 1984), but here we wish to point out its incorporation at the end of the century into Spanish Geography. (Torres Campos, 1896).

Also at the end of the 19th century what might be termed morphostructural units of the Iberian Peninsula were introduced into the Geography manuals (Solé, 1966 and López Gómez, 1990). Based on an enumerative conception, the work completed by Fischer in 1893 entailed a scientific innovation by introducing geological terminology in the definition of these units, based on their major forms. In 1896 Lapparent's map of the natural regions of Spain appeared, based on the same criteria. López Gómez highlights the importance of the contributions of Hernández-Pacheco and of Dantin, who already in our century were initiating the modern Spanish Physical Geography. Indeed, the establishment of these units, which today are taken for granted, constituted a fundamental development, «a radical change» in Spanish Geomorphology.

It should be pointed out that the morphological notion of the «Meseta», used to define the interior of the Iberian Peninsula, was introduced by Humboldt but did not come into wider acceptance until its use by Reclus (Solé, 1966).

Hernández-Pacheco was, in the same way as Prado, to carry out a «physiographic» and «geological» synthesis, by which he claimed «the landscape is a result of the geographic environment and the geological reality». For example, the rocky crag «is one of the fundamental elements constituting the geographic landscape». Thus he made quite clear the connection between both fields of study. The Physical Geography of Spain from then on was to be based on this synthesis, which is not surprising given the quality of the work. For Dantin, on the other hand, geomorphology was not in itself quite so crucial, but he believed «the foundations on which we base our physical geography are, at each step, geological». It is the earth's materials and tectonics which «explain, in large part, the present-day regional landforms and their hydrography and biogeography», and therefore he conceded to Geomorphology «the utmost interest». This demonstrates the role which this science was to play in Spanish Geography. As in other countries, particularly France, Geomorphology became fundamental in regional studies, and it was in this area in which it was to develop.

In the meantime, geomorphology had also made important advances in other specific fields, as was the case following the karstic observations made by Cortázar in 1874. The contributions made in the first quarter of the 20th century

were of great importance in the study of glacial landforms, thanks to the systematic research undertaken by Obermaier, Carandell, Fernández Navarro and Huguet del Villar, which established the characteristics, the magnitude and the locations of glacial features in Spanish mountains. However, in the methods used by the researchers there was still a mixture of influences from Prehistory, Geology and Geography.

In the 30s hypotheses of polycyclical modelling were also developed, those formulated by Schwenzner in explaining the Sistema Central (central mountain chain) are illustrative of this, giving rise to a process of lengthy reconsideration, which, at the time, meant efforts to find global morphological explanations, which although well constructed were excessively theoretical. They originated from a morphology then highly popular in other countries, increasingly more abstract - but quite distinct from the realism of, for example, Hernández Pacheco's theories of river terraces -, which implied perhaps a greater connection to geometry than to naturalism, a fact which would not fail to be of consequence. Thus, two stages have been identified (Muñoz, 1988), the first at the start of the century, «Physiographic and naturalist», and the second, prior to the Civil War, in which Davis' Cycle was introduced; however the number of its supporters was still very small. In any case it is a complying morphology to the main methodological currents of the time.

THE TRUNK

P. Birot and L. Solé, both of whom were physical geographers, although the latter was also a geologist, were to make important studies of the morphology of the Iberian Peninsula. Their research was carried out within the traditions of French Geography of the 30s and 40s, and was responsible for introducing these methods into Spain, giving rise to a collection of specialized pieces of research, which later would provide the bases of a subsequent understanding of certain regions. This research, therefore represents the rooting. of Spanish geomorphological research.

As Muñoz has rightly indicated this influence, although great, was not only French in origin, but also German, as an important group of researchers from this latter country, including some well-known geographers, was working in Spain up to the 60s. Research areas also began to diversify, so as from 1960, apart from taking an interest in fluvial and glacial modelling, researchers began particularly to look at climatic (periglacial, semi-arid, etc.), karstic, coastal and structural morphological processes. At the same time, sedimentological techniques began to have an influence on Spanish geomorphological research (Muñoz, 1988), coinciding with a shift in thinking towards a morphoclimatic understanding, put forward in the theses and methods expounded by Tricart. The result was that before 1970 Geomorphology was set up and introduced, both epistemologically and methodologically, into the geography departments of the Spanish University.

Nevertheless, the road embarked upon earlier was not, at least in the initial stages, to be abandoned. This can be seen, for instance, in glacial morphology, which later was to suffer temporary neglect, when geomorphologists changed their approach (geologists and geographers, in general, may, for the same reasons, also have changed their approach, albeit in other aspects). The scholastic

cycle, however, was to be permanently abandoned. These events are symptomatic, respectively, of the temporary abandonment of the naturalist spirit and a wider loss of faith in the system. This was to occur at a time when adaptation to accurate analysis using specific techniques, importation of models with a restricted application to specific cases and adaptation to various international influences was on the increase.

With reference to the glacial research made at this time it is worth remembering the contributions made in Cantabria by Carlé, FernándezBollo, Gómez de la Larena, González Echegaray, Hazera, F. Hernández-Pacheco (13 studies made between 1930 and 1962), Kopp, Lotze, Llopis, Miotke, Nussbaum, Saenz García, Saenz Ridruejo, Schmitz, Vidal Box and Vosseler. And those made in the Spanish Pyrenees, by Barrère (at least 12 publications), Boyé, Casteret, Faucher, Fontboté, García Sainz (18 studies), Gomez de Larena, Hernández Pacheco, Llopis, Llobet, Martí Bono, Nussbaum, Plandé, Riba, Sermet, Solé, Taillefer, Viers and Vidal Box. In the Sistema Central by Alía, Asensio, Franzle, Hernández Pacheco, Menéndez Amor, Vaudour, Vidal Box and Wernet. In the Ibérica by López Gómez, Riba and Thornes. In the Béticas by Dresch, García Sainz, Hempel, Messerli, Paschinger, Sermet and Solé. In short, this represents an important contribution, with a significant participation by geographers.

Birot and Solé's work on the morphology of the «Cordillera Central Española» (Spanish Central Mountain Range) written in 1954 exemplifies the debate on erosive surfaces. The evolution of relief is given a cyclical interpretation, based on typical erosion surfaces and tectonic uplevelling, the influence of which gives rise to the major existing landforms. Their analysis is complex, detailed and meticulous. Sanz Herráiz highlights one significant paragraph from this work, indicative, he claims of a belief in «the conceptual strength of cyclical theory»: «This inability to reduce the development of events to one single, simple formula seems to reveal a certain weakness. It would clearly be more reassuring for the spirit to admit that the principal massifs of the Cordillera Central are residual nuclei which have escaped the attacks of the erosion cycle... But it is difficult to be satisfied by this simple solution». Those who have conscientiously read through this work, and they are probably few in number, will know that this publication has contributed to the strength of Spanish geomorphology. (Birot and Solé, 1954).

The first volume of «Geografía de España y Portugal» edited by M. de Terán and published in 1952 marks, however, an indisputable landmark in the brief history of Spanish morphology. It was written by L. Solé Sabarís, with the collaboration of N. Llopis. The information collected and presented is abundant, detailed and meticulously expounded as well as being intelligently expressed. The illustrations, highly specialized in their content, are both numerous and expressive, in particular the block diagrams. Spanish morphology demonstrated in this book its real worth, that it had capable researchers and that it knew the Spanish territory. The bibliography is further evidence of this, offering a long list of references which has served as a guide to other scholars over many years. The content of this unique book embraces physiography, rock type, structural units and their geological evolution and the detailed study of large structural forms: first, the Hercynian mountains and the Alpine chains and then the Meseta and its surrounding areas, the Galician massif, the Cantabrian and Iberian chains, the

Pyrenees, the Ebro Valley, the Catalan coastal chain, the Béticas and the Guadalquivir and the Balearics. As can be seen the Canary Islands are not included, a fact which, unfortunately, is hard to justify. The geological evolution is integrated with the morphological history, the fluvial network, the morphostructural units, the erosion surfaces, glacial processes, indeed with all the main prevailing research interests.

However, in retrospect, other characteristics can also be identified: the work is more geological than geomorphological in its conception, it presents theories which logically have been superceded, there is an unevenness of coverage of certain subjects and sectors, there is a lack of strictly geomorphological cartography; yet all of this would have been typical of the period in which it was written. Today such a study would take a different approach concentrating on: structural-morphotectonic forms, lithomorphology, forms and evolution of the model, morphological units and their corresponding cartography, processes, experimental data, etc., together with other regional information. But it is unlikely that such an exhaustive study could be repeated. The work is representative of its era and, within these limitations, was a vital contribution. The geographers of later generations are undoubtedly indebted to this work. (Solé and Llopis, 1952).

In the middle of the present century the contribution made by geographers to geomorphological research began to grow (Muñoz, 1988), at the same time as the journal, published by the «Instituto Juan Sebastián Elcano», of the CSIC, «Estudios Geográficos», became the main publication for such studies. The interest shown by Terán, editor of the Geography of Spain mentioned earlier and Secretary of this journal, for Geomorphology was constant, although his own research was usually in other fields of geography.

However, in his articles he writes on such subjects as volcanic craters, the evolution of theories related to orogenesis, continental drift and Quaternary research, but in relation to their position within geographic understanding, an understanding which they serve to enhance. That is, within a wider geographic conception than that which is concerned solely with data collection.

It is in this belief that Terán quotes Richthofen, who claimed that Geography explains the boundary on our planet where land, sea and sky come together: continents, countries, landscapes, villages; and that Terán writes «the earth which sustains us and the air we breathe, the rocks and their vegetation, the skies and the seas, the waters which flow from the earth into the seas, the plains and the mountains, the cultivated fields, the village and the city and all things which man contributes to his natural horizon.» It is an understanding of this reality which is the object of geography: «reality in the earth's surface is not the landform away from the climatic conditions acting thereon, away from its vegetation cover, and from all that is added by man's labours, the reality is this coherent whole» (Terán, 1960).

Working within the same tradition, Jesús García Fernández describes geomorphological research as the study of «the infrastructure of the landscape»; claiming that an understanding of relief has a fundamental importance in the geographic goal. Thus, he stresses the importance of the «form» and its origin within the geographic objective and the organization of the earth's surface; that is the

present-day relief, which, to a greater or lesser extent, is composed of inherited forms, which, «do not correspond to present-day erosive processes». The first principle of Geomorphology is that of the constructive forces; the architects of the continents and originators of segregated spaces, which, in turn, define the major ecological zones. These are the structural landforms which give the basic shape to the relief. However, according to García Fernández, it is the scholarly spirit and the geological focus which have had a greater influence on the geographer than the earth's surface itself, and that this has caused a shift of interest especially towards erosive forms, ignoring the hierarchization of events. This hierarchization shows that «the erosive forms not only appear as dependent of the structural forms, in most cases the latter are the cause of their origin. Thus, the morphosculptures are subordinate to the morphostructures». Therefore, in Geography the essence of Geomorphology are the structural forms, «the real framework of relief» (García Fernández, 1990).

The research and teaching of García Fernández has consequently been guided by these criteria. His work has been fundamental both in the dedication of a large number of geographers to the field of Geomorphology since the 60s, and in the maintenance of the lines of research in structural morphology; in short, in the introduction of a way of interpreting relief in Geography. One of the ways in which this influence has been extended has been through a series of «Geomorphology Field Work Courses», organized by this Professor of Geography at the Universidad de Valladolid since 1966. Several generations of geographers have passed through these courses, now in their 23rd edition, some of whom are now lecturers in Geomorphology in various Spanish universities. On the whole, these highly influential courses have been noticeable for the silent and persistent way in which they have gone about their demanding work; above all, during the first decade when there were very few centres equipped for this teaching in Spain. The rigorousness of the courses, the implicitness of the method, the interest of the research areas, the intelligent development of the course, the field work giving first hand experience of landforms and the region, the creation of the belief that this type of study was a normal part of the geographer's task, among other factors, gave rise to a way of thinking in Geomorphology which has subsequently been passed from teachers to their students.

Also in the 60s, V. Rosselló published his first morphological studies of the Valencian coast, a tradition which he and his many followers have maintained to the present day, in an impressive collection of publications, representing a clearly defined school within Spanish Geography. The tradition gained even greater impetus from Rosselló's study of Mallorca, published in 1964, in which morphology was interpreted within a more global section of the Natural Landscape, while the latter was interpreted in a complex incorporating all the constituents of geographic space. It was this development which led to an important morphological contribution to theories of a regional nature, which are not always recognised today, and which represents a very geographical way of understanding and contributing to an understanding of relief.

It should not be forgotten that the education of the geographer at this time demanded a global training, so it is not unusual, for example, that there exists a monograph on periglacial modelling written by A. Floristan in 1953, or that a practising geomorphologist might be the author of books related to human

geography. Similarly, S. Llobet, who is well known for his role in the establishment of geomorphology among Catalan geographers, published a study on Andorra in 1947, which contains a very important geomorphological analysis, albeit alongside research areas which include, for example, a study of rural life, which, incidentally, is today of particular interest.

Nevertheless, in 1964 Mensua published specific descriptions of the glacises of the Ebro and in 1969 published models of the Muela de Zaragoza, and shortly afterwards researched and published, with other geomorphologists, models of similar features, showing that the specialization of geographers in the field of Geomorphology had already started to take place. Indeed in the case of Mensua we could even talk of a specialization in certain aspects of climatic morphogenesis. As a result, not only individuals, but groups of geographers, were beginning to emerge, showing a professional and specialised interest in distinct aspects of morphological research.

The organization of the universities which was then taking place meant the establishment of Geography departments which were better able to adapt to these trends. Albentosa has reported that «in 1950 there were only 5 professors of Geography and this figure had only increased up to 11 by 1960», but between this date and 1972 «Geography departments were started in all Universities (Albentosa, 1982).

THE BRANCHES

The institutionalization of Physical Geography in the universities, which made possible the introduction of geomorphology, took place gradually up to 1985. The first step was the design of curricula containing the subject of Geomorphology, this stimulated a teaching interest and the subsequent training of students, which in turn, led to the writing of dissertations and doctoral theses, culminating in research programmes investigating quite specific questions. The process was completed with the creation of lectureships and chairs in Physical Geography and the marking out of the boundaries of the subject. As a result, Geomorphology was logically to undergo growth within the Geography departments. The first doctoral theses specifically in Physical Geography date from 1973 and 1976, and are a reflection of these developments, but immediately after this date and up to the present day there has been an increase in the number of geomorphological studies in those universities where the subject has taken root.

According to the information compiled by J. Muñoz, between 1970 and 1984 some 500 geomorphological studies were published in Spain by 275 different authors, representing an increase of 300% on the 1950s (Muñoz, 1988). The geographic nature of these studies, however, has not been lost, although they have acquired other environmental aspects, based on the ideas of Tricart and climatic morphology, establishing a relation with those elements which make up the natural landscape, yet, inevitably this is not true of all cases. Also, it has been a time for renewal of techniques, with a growing influence from the English speaking world, at times on the limits of geography, while at others on the mere limits of technique.

The detailed studies undertaken by J. Muñoz carefully describe the characteristics of this change. Modifications in research techniques are most frequent in

dynamic Geomorphology, above all in the analyses of fluvial, slope, coastal, karstic, weathering and periglacial processes, where quantitative and experimental methods have been introduced. But it is the techniques in sedimentology, the most deeply rooted in geomorphology, which are most often used in research; to the point of being characteristic of this stage of geomorphological production by geographers. According to Muñoz, about 50% of the publications in Spanish geomorphology between 1973 and 1982 were undertaken in just five areas: karstic, fluvial, arid, coastal and periglacial. This limited interest may be due to a certain concentration on those areas which are best studied with these new methods. Consequently, other aspects with a strong tradition and of clear geographic interest, such as structural morphology, are practised on a more limited basis. (Muñoz, 1984).

Nevertheless, there is still an evident diversity of research topics. A reasonable number of studies of epistemology and structural morphology have been published, which have opened up new fields, and as already noted there has been a proliferation of research in dynamic and climatic morphology. More specifically, in morphostructures, this has involved studies of the morphology of shelves and ancient massifs, folded structures, faulted structures, the morphology of mountain chains - not only within the Peninsula -, morphology of volcanoes, river basins and granitic areas, and has resulted in the consolidation of specialized research teams and the undertaking of systematic research even beyond the frontiers of Spanish territory. In climatic and dynamic morphology, studies have been made in coastal, karstic, glacial, periglacial, fluvial and torrential, semi-arid, and mountain zones and, in certain of these cases, also abroad.

At least two generations can be identified in this phase. The first, and smaller of the two, is directly linked to the main stream of geomorphology described in the previous section, still of course valid. It has channeled its data and ideas, at the same time as it has contributed to the scientific and material definition of present day Physical Geography, into stimulating the significant growth of the second generation. It is this latter generation, however, that in recent years has undertaken the largest part of rigorous academic research (theses, books, articles, conference papers) which has quantitatively changed the nature of earlier contributions.

Since the start of the 80s this young generation of geomorphologists has come to dominate the meetings and conferences in the field and now constitute the majority of those geographers who are members of the recently formed and highly active «Working Group» in Physical Geography of the «Asociación de Geógrafos Españoles y Sociedad Española de Geomorfología». At these meetings and in the professional journals, such as «Cuaternario y Geomorfología», the connection has been established with the morphological studies carried out by geologists and engineers, whose tradition in experimentation and more applied techniques have progressively come to have an influence on the geographic field. At the same time this new generation have formed departmental teams making frequent contributions to their own journals, albeit perhaps somewhat wide ranging and diverse in their nature. The resulting morphological cartography, carried out with precision and at times with excellency, has rapidly mapped out Spanish territory, so that thanks to these studies (which do not always include as much material support as one might have wished) today we have mapped out a

good proportion of the geomorphology of Spain. The number of analyses is making it possible now to attempt new syntheses, although geographic criteria are not usually dominant within these.

As a consequence, the influence of these geographic studies is growing among the specialists of other countries and Spanish naturalists, thereby, increasing international links and collaboration; with an evident tendency to reduce the visits of foreign researchers who work alone without any contact with Spanish departments.

The monograph of the «Sociedad Española de Geomorfología» entitled «Perspectivas en Geomorfología» and published in 1988 presents an interesting picture of some, but by no means all, of the current characteristics and trends within Spanish morphology, and also of its geological renewal, which has had a great influence on geographers and been highly effective in defining the features of this science in the present day, being certainly more dominant in this respect than an integrative geographic thought. However, the strength of this latter way of thinking should not be undervalued: in 11 of the book's 17 sections geographers have collaborated. These sections range from neotectonics to cartography, but only 4 of them are tecto- or lithomorphological, while there is a large number of studies in technique, as mentioned earlier, and a clear will to work in a way which is more quantitative and applied. This trend would seem to have strengthened even more in latter years.

Similarly, the Proceedings of the First National Conference in Geomorphology, held in 1990, show this same trend: the inaugural meeting focused on applied science, only one round table was held on structural morphology while 10 were dedicated to climatic and dynamic morphology, the former with 6 communications and the rest with 68 (of which 24 were solely related to fluvial morphology and land erosion). In some of the studies a serious lack of information was detected as regards earlier geographic studies, something which is becoming all too common place.

Based on a geographic criterion, which is neither classic nor modern, the author has recently distributed the topics in a different way in the «Atlas de Geomorfología» (1986) and the «Relieve de la Tierra» (1982). In the first of these, of the 18 subjects, 8 are related to structural forms and the rest to modelling (in dynamic and climatic morphology), including anthropic action and two types of rock modelling, which are closely related to structural forms. In the second, the aim of which was to initiate studies of relief, it was considered more appropriate to dedicate, of the 30 subjects, 4 to general matters, 18 to basic morphostructures, 3 to modelling in rocks, and 5 to dynamic and climatic morphology, this I consider to be didactically correct from a geographic point of view, that is in the order in which relief features appear in reality. In small scale research it would appear to be advisable to set the balance between morphostructures and modelling, beginning with a physiographic introduction and concluding with the establishment of morphological landscape units, increasing the amount of cartography as a means and an end. The techniques merely support the analysis. Sectorial studies take their meaning from being interpreted as partial analytical contributions. In any case, the geographic perspective is one of landscape geomorphology, one in which the study is guided towards an understanding of the landscape.

I would like to include, as a final review, a quick guide to the work being undertaken by the various Spanish geography departments in the field of Geomorphology. I apologize for any errors or omissions in the following information, which unfortunately remains incomplete, and would like to thank those who have helped in its compilation.

At the Universidad de Santiago research is currently focused on ancient massifs, granitic morphology, and the modelling of mountain, fluvial and present-day processes particularly in Galicia. Three morphological tesinas (postgraduate projects) are being undertaken there. At the Universidad de Oviedo, where two geomorphological theses and two tesinas are being prepared, glacial, karstic and coastal landforms in Cantabria and the volcanoes of the Campo de Calatrava are being studied. At the Universidad de Santander, where there are three doctors of Geomorphology, coastal, structural, karstic, fluvial, glacial and periglacial landforms are being studied not only within Cantabria, but also in the Pyrenees and even in the Andes and the Antarctic. At the Universidad del País Vasco, which has two doctors of morphology, research interest is in karst, the morphology of the Atlantic mountains, coastal and fluvial landforms in Guipúzcoa, with particular reference to the paleo-landscapes of the holocene and present-day processes. At the Universidad de León the specialization in anthropic erosion should be highlighted, alongside studies of structural, fluvial, karstic and mountain morphology in the León area. Here, one thesis and three tesinas are being carried out in this field and the department is making contributions to the field of cartography.

At the Universidad de Zaragoza geographic studies have a long tradition in morphology, having studied an area which runs from the Pyrenees and the Pre-Pyrenees, through the Ebro Valley and the Iberian border up to Iberia, examining all areas of morphological interest, but in particular those of modelling, especially semi-arid features and, according to my records, at least 7 theses are being prepared. In the Instituto Pirenaico de Ecología in the same city, studies are being made of glacial morphology and mountain dynamics in general, with special attention being given to present-day processes and morphological cartography. At the Colegio Universitario de La Rioja, which has close links with the previous two institutions, the research has focused on mountain areas, with respect to dynamic and glacial morphology, present-day processes, anthropic actions, and particular attention is given to cartography. Two theses and a tesina are currently being prepared. At the Universidad de Navarra research has been carried out in the regional morphology and the morphology of the North Meseta. At the Universidad de Barcelona they have concentrated largely on glacial, periglacial, slope, and fluvial morphology and cartography, in the Pyrenees, the Catalan valleys and the coastal system, with particular emphasis on the bioclimatic and dynamic characteristics, although the area under research has been widened to include the Sierra Nevada. There are currently 4 specialized theses in preparation and 10 more with a morphological content as well as numerous tesinas. The department has also made a large contribution, at different levels, to cartography.

The Universidad de Valencia also has a notable tradition in Geomorphology, and has produced important studies of coastal landforms and fluvial, periglacial and slope modelling as well as present-day processes, in Valencia and the Balearics; currently there are 7 doctors of Geomorphology working in the speciality. In Alicante, where there are two doctors of morphology, studies are being made in

structural morphology, in connection with the school of García Fernández (Valladolid), paying particular attention to morphotectonics, and in the modelling of the region.

At the Universidad de Murcia, with three doctors of geomorphology, there is intense activity in this field and since the 70s there has been a significant continuity of research, particularly related to fluvial, karstic, and semi-arid morphology and present-day processes. In the Balearics the best known studies are those made of the islands' karst features.

At the Universidad de Salamanca, where there is one doctor of geomorphology, studies are being undertaken of mountain (North-East, North and South of the Meseta), glacial, structural and fluvial morphology and of the landforms of the peneplain and the basin. In Valladolid, one of the main centres of geographic morphology, there is a strong tradition in this field. The research has largely been carried out in the structural morphology of the North Meseta and its range of mountains and the landforms of Alicante, above all folded structures, but also in the evolution of the Duero Basin. There are currently three doctors of geomorphology in this department. At the Universidad de Cáceres, where there is one doctor of geomorphology, the mountain ranges of Extremadura and the landforms of the peneplain are being studied. At the Universidad de La Mancha, where there is one doctor of geomorphology, morphological cartography of the Hercynian zone and the volcanic area is being carried out.

At the Universidad Complutense de Madrid shelf, granitic, volcanic, fluvial, glacial, and semi-arid morphology are being researched largely in the Meseta, but also in the Pyrenees, Cantabria, the Canary Islands and Iberia, as well as continuing with the plan studies in Latin America. There are 4 theses being prepared in this field and 9 tesinas along with many others with a morphological content although within a wider frame. The Universidad Autónoma de Madrid has six doctors specialising in geomorphology; their fields of research are shelf, faulted structure, basin, mountain range and volcanic morphology, and karstic, fluvial, slope, glacial, periglacial and semi-arid modelling, with particular attention being given to cartography. Research areas include the mountains of the South Meseta and the Meseta itself also Andalusia, Cantabria, the Pyrenees, Iberia and the Canary Islands, and abroad with studies in Etna, the Andes, Mexico, the Himalayas, Karakorum, Greenland and the Antarctic.

The Universidad de Córdoba is studying the landforms of the Andalusian countryside, in Granada the karstic landforms and the regional glacial features, and in Malaga the Andalusian glacia. The Universidad de Sevilla is studying surface features, karst, coastal dynamics, the alluvial quaternary and holocene evolution in the Guadalquivir and Guadiana area, in Sierra Morena and Andalusia and in the coast off Huelva and Cadiz, but also the karst of the Dominican Republic and the karst, piedmonts and the quaternary of Morocco. Three theses and three tesinas are being carried out in this field and a wide area of the places mentioned have been mapped.

Finally, the Universidad de Laguna, specializing in volcanic geomorphology, has studied the structural, tectovolcanic and morpholithological aspects, including the effects of the dynamics of eruptions, on various building types, as well as coastal, torrential, slope, periglacial and semi-arid modelling, present day processes and

the morphoclimatic evolution during the quaternary. There are five specialists in this field; the morphological cartography of the Archipelago has been carried out and studies of the volcanic and the dynamic morphology have been made in the Antarctic. Also at the Universidad of Las Palmas research has been carried out into volcanic features and a contribution has been made to the cartography.

The situation is encouraging, but this current position has not been reached without considerable effort and without overcoming many obstacles; while due recognition has not always been forthcoming. It is worthwhile, therefore, to remind ourselves of the present state of geomorphology and to look forward to the future with assurance. However, to conclude I have chosen to look back and to recall how Terán defined our geographic goal; the interpretation of the landscape: «a complex of facts and phenomena whose combination results in a space with its own physiognomic character». I have always believed that the geographer's interest in Geomorphology is derived from its effectiveness in providing these explanations, from its ability to interpret the most significant elements in the framework of the landscape, from its very form, from its relations with the rest of the environment and with man who lives within it, appreciates it and makes use of it.

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3. CLIMATOLOGY

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BEGINNINGS OF MODERN CLIMATOLOGY IN SPAIN

Climatology's recent development in Spain has been studied by Albentosa (1988) and Muñoz (1984), the former referring to the period 1973-82. The general work by Alcoforado, Daveau and Brum Ferreira (1988) also makes some references to Spain. We are going to restrict to the period since 1970 and to geographical publications; the work by meteorologists will be studied somewhere else. A significant academic event was the endowment, at the end of the '50s, of professor posts in the Schools or Sections of Geography and History, either existing or of new creation, that were to teach Physical Geography and Climatology. Therefore, working groups appeared in our discipline; there was an increase in papers for periodicals and presentations for Congresses, while thesis in Climatology were written. The first thesis of all was by Albentosa (1973).

Since the '50s, there has been a shift to the new dynamic and synoptic concepts, thanks to foreign works and to pioneering Spanish works such as that by Lautensach and his group or the synthesis carried out by Masachs Alavedra; it was when the first articles by López Gómez and by García Fernández also appeared. Geographers started using maps and data of daily forecasts as basic source; Alcoforado and co-workers said that Forecasts are «the basic start-engine of dynamic Climatology», to which they add Remote Sensing and Computer Science. Meteorology's new possibilities are basic for Climatology's re-birth among geographers: «Pédélaborde's, in France, and López Gómez's activities in Spain symbolize this new attitude» (Alcoforado, Daveau and Brum, 1988, 153), «López Gómez's studies on atmospheric streams ... are to be thought as the basis from which this working line starts in the Spanish Geography» (Albentosa, 1988, 336). At the end of the '60s and in the decade of the seventies there is an accelerated development; it starts a new stage resulting not from a constant evolution but from a true «eclosion», in Albentosa's words, in the '80s. From 1940-49, *Estudios Geográficos* only published 8 Climatologic papers; from 1950-59, *Estudios Geográficos* and *Geographica* published just 13 articles, and in the next decade, climatological articles were still a few; however, from 1971-82, in other new journals and colloquies, the total of published articles in our subject is 89 (24 % of articles in Physical Geography) and most of them appeared recently. 27 articles follow traditional separative patterns and the other 62 papers are divided according to some modern innovations in three similar groups: synoptic, quantitative or new analytic Climatology, and environmental or applied (Muñoz, 1984, 37). As evidence of this development and renewal we must refer to the VII Colloquy in Pamplona, in 1981, where there was a section devoted to the Climate of Mountain, with 24 presentations, most of them using quantitative techniques. In later Colloquies, there were similar sections, such as the one on

Drought in the X Colloquy in Murcia (1985). The Instituto Sebastián Elcano organized in 1983 a meeting on Exceptional Rainfalls; there were 14 presentations, most of them synoptic and most of them by geographers. In 1986 the Instituto organized the meeting of the Climatic Changes Group, within the IGU Regional Conference. In Barcelona Martín Vide organized the meeting of the Topoclimotological Investigation and Mapping Group. Monographic issues on exceptional rainfalls were published by *Estudios Geográficos* (1983), *Cuadernos de Geografía* (Valencia, 1983), as well as monographies: *Lluvias torrenciales e inundaciones* (Alicante, 1983), *Avenidas fluviales e inundaciones* (Alicante, 1989), etc. Such an activity would have been unthinkable a few years before.

As a recent innovation we can add the progress of Urban Climatology, started in Madrid, and the usage of remote sensing, not only the usage of normal images from meteorologic satellites, but also of thermal infra-red sensing, employed in temperature studies.

In the following pages we refer to articles, not all the published ones, which are representative and by geographers. Due to restrictions on space, we exclude from the Bibliography some 70 papers published in known or repeated journals. These journals appear in the text under an abbreviation: EG - *Estudios Geográficos*; CG - *Cuadernos Geográficos*, in Granada; CI - *Cuadernos de Investigación*, in Logroño; CV - *Cuadernos de Geografía*, in Valencia; NG - *Notes de Geografía Física*, in Barcelona; PA - *Paralelo 37°*, in Almería; PM - *Papeles de Geografía*, in Murcia; RG - *Revista de Geografía*, in Barcelona; SG - *Boletín de la Real Sociedad Geográfica*; T - *Tarraco*, in Tarragona. Other fifty papers, mentioned in the text, appeared in Coloquies or monographic issues.

GENERAL STUDIES

History of Climatology and Methodology. Studies on History of Climatology in Spain are few. The noteworthy works by Muñoz and Albentosa (already mentioned) as well as the general study by Alcoforado, Daveau and Brum Ferreira refer to recent developments. López Gómez (1987, 1988) analyzed earlier periods; García de Pedraza and Giménez de la Cuadra study Meteorology's History (1985). Mateu (1979) and Chiner & López García (CV, 1987) study Valencian area and Albentosa (1975) study Cataluña. Huerta's work (1973) presents a detailed bibliography. Other regional works are those by Albentosa (RG, 1980) on Cataluña and by Capel (PA, 1979) on Andalucía.

Quantitative methodological questions are studied in many papers; there are, however, few articles on general concepts: Albentosa (RG, 1976), Clavero, Martín Vide & Raso (NG, 1980); on didactic aspects: Clavero & Raso (1983) and Raso (1986); or on Phyto-Climatology, such as the paper by Fidalgo (1986).

General and Spanish Climatology. We still lack a modern and comprehensive Spanish text-book on General Climatology; there is, however, a useful chapter by Gil Olcina (1984) in a Physical Geography text-book, and a recent work by Martín Vide (1991). Linés' work (1982) has a specific purpose.

Modern synthesis on our climate play a relevant paper on general knowledge, although many of them are due to its authors' researches. We have to mention the works by Capel (1981), Font Tullot (1983), and the Atlas (1983, INM) edited

by Font Tullot. Albentosa's posthumous work (1989) is in this field. Among general works, we have to point out Linés' (1970), López Gómez's (1978) or Albentosa's (1989) chapters on Spanish climate.

The interest on climate definition appears in many general or specific works. In most cases, they are concrete classifications for the whole of Spain where the author has made use of the factorial analysis, as is the case of Muñoz (EG, 1980), or a classification for the Southern Meseta using discriminant analysis, as in the work by Fernández García & Galán (1990). In other cases, authors have made use of international diffusion systems: J. & A. López Gómez employed Köppen's system in several regions, on wet Cataluña (1979), Canary Islands (EG, 1979), dry areas (PM, 1987), or on the Ebro river valley (1987). Elías Castillo y Ruiz Beltrán employed Papadakis' system on an agrarian study (1973). These systems as well as that by Thornthwaite and several aridness rates are applied to many studies, most of them agrarian.

CLIMATE CHANGES

It is a subject of interest nowadays; it has resulted in abundant scientific production and in developing complex simulation models, mainly by physicists and meteorologists. Spanish geographers have studied historic changes, in the last century mainly, analyzing series of temperatures and rainfalls. Studies on rains are López Bermúdez's work on Murcia (PM, 1971), Albentosa's (RB, 1975) on Barcelona, Bernabé & Mateu's (CV, 1976) on Valencia. Other authors analyze the temperature evolution: Capel (CG, 1975) on Seville, López Gómez, Fernández García & Cañada (1986) on Southern Meseta and Madrid; Raso (NG, 1987) and Cuadrat (1989) on the Ebro Basin; Moreno & Martín Vide (1986, 1989) on Cadiz's coasts. Fontana has gathered historic data in six un-published books, and Font Tullot has published recently another book (1988). Works that relate climate and vegetation are Creus & Puigdefábregas' study on pine dendro-chronology (CL, 1976) or López Gómez's study on sugar cane in Valencia (EG, 1972).

ANALYTICAL STUDIES OF CLIMATE AND ELEMENTS

They are very frequent and refer to different spaces, either to the whole of the country or to local areas. Many of them have maps; a noteworthy feature is that statistical methods are refined. Most studies refer to rainfalls; it is due to their relevance in our country, to the existence of a thick network of pluviometric observatories and to ancient series. Other subjects are temperatures and other elements.

A typical example appears in the presentations on mountain climates to the VII Colloquy of Geography (Pamplona, 1981), which do not appear in the Bibliography. General papers are those by López Gómez (J. & A.), Montaner et al.; and Plan & Zarza; synoptic presentations are by Villegas & Castillo, and by Rodríguez Martínez et al. However, most of them study rains (Albentosa, Cuadrat, Plana, Xercavins, Fernández García, Martín Vide, Clavero, Pérez Iglesias & Romaní, Raso and Ruiz Urrestarazu), and a few are on temperatures (Fernández García, Galán Gallego and Gesteiro, Marzol, etc.). There are papers on new methods on rainfalls automatic maps (Fernández García and Moreno), on Thiessen's model assessment (Polo, Viña & Rodríguez), on variance analysis (López Bermúdez et al.), on logistic curves fitting (Alonso et al.). This working

line proceeds on in later scientific meetings such as the IX Colloquy in Murcia (1985); there were seven climate papers presented to the Section of Arid Areas (by Capel, Martín Vide & Moreno; Pérez Iglesias & Romaní; Piqueras & Gómez Cortés; Pita, Raso, Sánchez Toribio and Xercavins).

Among the many publications of this decade, we can mention those on local or country climate, such as Floristán's on Pamplona (1976), Quereda's on Plana de Castellón (1974) and Pita's on Bahía de Cádiz (1989), or papers on provincial climate such as those on Madrid (Fernández García, SG, 1975) and Ciudad Real (Fernández García, 1991), Toledo (Galán, EG, 1981), Cáceres (Cañada, 1984), Guadalajara (Fernández García & González Martín, SG, 1980), Almería (Capel, 1977), Teruel (Cuadrat, 1991). Other articles refer to certain elements, mainly rainfalls, with accurate quantitative analysis sometimes, and the area may range from concrete places to whole regions: for example, Uriarte's paper on the Cantabrian coast (1983), López Bonillo's on Tarragona area (T, 1980), Martín Vide's on Barcelona, the Pyrenees and the Mediterranean coast (NG, 1979; NG, 1980; RB, 1980; NG, 1985), Raso's on the Balearic Islands (1982 and NG, 1984), Raso et al. on Cataluña (RG, 1984), Cuadrat on Aragón (SG, 1984), Creus & Puigdefábregas' on the Pyrenees (EG, 1978 and CL, 1978), López Gómez, Fernández García et al. on Southern Sub-Meseta (1986), or may present a new region classification, as Fernández García & Galán (1990); Quereda on Castellón (1976), Clavero on Valencia (NG, 1979; NG, 1981) or Capel & Andújar on Andalucía (PA, 1978), Moreno García on the Genil River Basin (CG, 1986), Pita on the Guadalquivir Basin (1985).

There are fewer papers on other climatic elements, for example on Madrid's winds by Fernández García (EG, 1982), on stagnation and föhn (García de Pedraza, 1973), Cuadrat on San Juan de la Peña (1978), Peñarrocha & Pérez Cueva on Ebro delta (Congress of Valencia 1991), a general work by Capel (PA, 1977), on Ordesa by Cuadrat (1978) or on San Sebastián by Uriarte (1986), on relative humidity by Capel (SG, 1979), temperatures on Tarragona area by López Bonillo (T, 1981), on Lozoya river valley by Muñoz (1979).

SYNOPTIC STUDIES. CLIMATE THESIS

More relevant are those papers where, besides climatic elements, the authors analyze dynamic and synoptic aspects, in the first place, some types of weather due to surface circulation, and in the second place, weather related to altitude phenomena.

Regional thesis usually present analytical studies, although some synoptic considerations may appear later on; the first of all, is Roselló's thesis on S. and SE. of Mallorca (1964). The seventies is when there appear climatic thesis, based on types of weather. The first is Albentosa's on Cataluña (1973), then Capel's on the Guadalquivir valley (1975), Fernández García's on Southern Meseta (1979), and other thesis carried out by a French author such as Mounier on N. and NW. Atlantic areas (1979). Other authors made use of statistical methods and techniques to define situations, for example Clavero on Valencia (1978), Raso on the Balearic Islands (1978), and Ruiz Urrestarazu on the Cantabrian Coast-Ebro Valley transition (1982). Recent thesis are E. Galán's (1990), who applies discriminant analysis to a classification of anti-cyclonic weather types in Spain, or Cañada's on

Extremadura (1989). Other thesis are Creus' on High Aragón (1977), Marzol's on precipitation in Canary Islands, Castillo Requena's on a weather classification for Andalucía (1988), and Ortega's on the Iberian Ridge (1991).

General weather types are also studied on the synthesis work on Spanish climate, already mentioned, and on works such as García Fernández's on Castilla and León (1986), Cascos' (1982) and Calonge's (1982) on summer and winter weather in Valladolid. Other articles are related to the already mentioned thesis: Fernández García's on Southern Sub-meseta (EG, 1980), Martín Vide's on the Mediterranean coast (1981), Raso's on the Balearic Islands (1980), Capel's on Lower Guadalquivir (SG, 1975, EG, 1978), Ruiz Urrestarazu's on Alava plains (1979), Galán's on discriminant analysis (EG, 1984), Brunet's on Tarragona (T, 1983), Cañada's on Extremadura (1980). On subjects outside our Iberian context, we have to point out García de Pedraza's study on connections of polar air and inter-tropical convergence (EG, 1986). Synoptic considerations are also usual in studies of peculiar phenomena.

PECULIAR PHENOMENA

We include those relatively-frequent but sporadic phenomena which belong to a climatic definition. On occasions, they present catastrophic features and are worth a special attention, since we can not forget the so-called Geography of Risks. The studies refer to two aspects: the quantitative with very refined statistical techniques, and the causal, within synoptic analysis.

Exceptional downpours

It is the topic that most interest has risen due to its catastrophic recurrence in the last decades. Valencia's 1957 big flood rose plenty of attention and altitude maps enabled scientists to point out the relevance of an altitude cold depression, the nowadays infamous «low cut-off» (García Miralles & Carrasco, INM, 1958), besides sea-land thermal differences, sharp relief, etc. Later floods were studied by several authors: Castillo Requena (PA, 1978), Capel Molina studies SE. and N. «low cut-offs» (PA, 1977; 1983), Conesa's analyzed the downpours on Lorca's fields and Cartagena (PM, 1985). In 1982, a heavy downpour caused a meeting at the Instituto Sebastián Elcano and the edition of a monographic issue of *Estudios Geográficos* (1983) with 14 papers (they are not in the Bibliography) by López Gómez, Miró Granada, Font, García de Pedraza, Peinado, López Bermúdez, Gil Olcina, Morales, Roselló, Mateu, Gascó, Albentosa, Martí Bono, García Ruiz & Puigdefábregas, as well as another monographic issue in *Cuadernos de Geografía* in Valencia (1983), with 15 articles of which three were climatic (by Roselló, Pérez Cueva and Armengot & Quereda); seven climatic articles in a general flood book (by Gil Olcina & Morales (ed.), 1989): articles by López Gómez, Gil Olcina, Albentosa, Quereda, Capel, Marzol and Martín Vide, and 3 climate articles by Gil Olcina, Ramos Hidalgo and Pujante Belvis in a book on torrential rains (Alicante, 1983).

Cold waves and frosts

Their study is essential in Agro-Climatology due to their great impact. As general study we have to mention that by García de Pedraza, Elías & Ruiz Beltrán

(1977), and Capel analyzed 1970-71 frosts (EG, 1972). Local studies are by Clavero, Martín Vide & Raso on Cataluña in 1980 (NG, 1981), by Cañada on Extremadura (SG, 1987), Fernández García & González Martín, on Molina de Aragón (1986), López Bonillo on NE (T, 1986), etc.

Other phenomena

Other phenomena are temperature inversions: López Gómez studied Madrid-Guadarrama temperature inversion with hot advection (EG, 1975), Puigdefábregas those of the Ebro Valley (1970), Galán & Gesteiro, those in Gredos and Iberica Ridges (1981); hot invasions, by Capel (CG, 1978); hail, by Raso (NG, 1984); snowfalls, by Martín Vide (1984). On droughts, see the interesting paper on Murcia's aridness and desertation by López Bermúdez (1985), general works are by Pérez Cueva (CV, 1983 and 1989), and by Clavero, Raso & Martín Vide (NG, 1981). Regional studies are on Valencia area by Boix (CG, 1982), by Pita on Andalucía (1986), etc.

ENVIRONMENTAL CLIMATOLOGY

Albentosa includes in this group those studies that relate climate and living beings, in special Man, but Muñoz opens it to the natural environment. Many times it means applied climatology. There are two basic areas, climate's effect on one side, and, on the other, the influence on climate by man, basically. The most important areas are Agro-climatology and Urban Climatology.

Agro-Climatology

In the thesis on Physical or Agrarian Geography, it is normal to find a chapter on the climate, studying frosts, hydric balances, etc., so relevant on Agriculture. The rule is to use Turc's, Penman, Thornthwaite's rates as well as Papadakis' agro-climatic classification (Elías Castillo & Ruiz Beltrán, 1973). We have to point out the *Atlas Agroclimático Nacional de España*, edited by León Llamazares et al. (1979) and published by the Ministry of Agriculture, and Almarza's work on seasonal hydric reports for 30 years (1941-70), which is not studied in the provincial monographies by Elías & Ruiz Beltrán. Noteworthy are the thesis by Juárez Rubio on the Guadiana river basin (1979), López Bonillo on Campo de Tarragona (1983), Sancho Comins on Castellón countries (1979), and Caselles on infra-red images (1983). Papers on agro-climatic aspects on Castilla-La Mancha are by Fernández García & Arroyo (1986), and Fernández García, Juárez Rubio, and García Rayego (1988). On Bioclimatology works Carballeira (1983) and on Climate and Vegetation, Fidalgo (EG, 1984 and 1989), González Rebollar (EG, 1984) and García Merchante (1989), among others.

Hydro and Morfo-climatology

The authors apply accurate techniques and models. On hydrology, see papers by Mateu (CV, 1974), Plana Castellví (1979 and 1980), Albentosa (NG, 1981), Fernández García (1989), Conesa (1990). On morfo-climatology, see articles by López Bermúdez (PM, 1979 and CL, 1985), Criado & Marzol (1985), Cuadrat & Pellicer (CL, 1983). García & Caselles made use of infra-red images on Valencia's gulf (CV, 1976; 1991).

Urban Climatology

It is very important nowadays; it has two main aspects: pollution and climate changes. On pollution different specialists have worked on physical-chemical aspects; geographical works are fewer: Albentosa (T, 1980), López Gómez & Fernández García on Madrid (EG, 1981), Marzol on Tenerife (1987), etc.

Urban climate changes studies were almost unedited in Spain; however, nowadays, analyses on urban heat island are developing. They employ direct measurings taken in urban trips as well as measurings from official observatories. Geographers from the Universidad Autónoma and C.S.I.C. started working on Madrid and its Metropolitan Area and publishing on the Urban Heat Island (López Gómez & Fernández García, EG, 1984; López Gómez et al., 1988) and on rainfalls (Fernández García, EG, 1991). Nowadays, they include other aspects such as the influence of Madrid's parks (Almendros' thesis, 1990) or satellite pictures (López Gómez, Moreno & Fernández García, EG, 1991). In Valencia, López García (CV, 1986, 1991) has studied sea temperature, and agro-climatology. Two teams work in Cataluña, Brunet's thesis on Tarragona (1990) and Moreno's thesis on Barcelona (1991); other groups work in Valencia, Zaragoza, Tenerife, etc.

Closely related are studies on climate comfort either referred to Spain by Garmendía (1974) and Jiménez Álvarez (1984), either on regions and places, by Alonso & Muñoz on Coasts and Castilla-La Mancha (SG, 1976; PA, 1985), by Calvo Palacios on Zaragoza (SG, 1976), and by Arroyo & Fernández García (1991) on Madrid, using data from inner and periferic observatories.

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4. CONTRIBUTION OF THE SPANISH GEOGRAPHY TO BIOGEOGRAPHY

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It is a topic to say that biogeographic studies are recent in Spanish Geography. They also say that these studies are even younger than other main areas in Physical Geography. Both aseverations are true in part.

There are works (López Gómez, 1955; María de Bolós, 1964) published at the same or at a similar time than other works on geomorphology and climate. Moreover, Panareda's thesis (1978) did not appear much later than Albentosa's thesis (1975) on Climatology or than Ibáñez Marcellán's thesis (1976) on Geomorphology. It is true that Panareda's thesis is not on biogeography but on landscape, but the biogeographic element is very important and meant the author's nonexclusive dedication to bio-geographic research. On the other hand, we have to remember that in many cases, as Bullón Mata and Sanz Herraiz (1987) point out, «Biogeography and Landscape usually are linked so very much in space and the authors studied that, sometimes, it is difficult to differentiate between the biogeographic contribution and whatever should not be included in other categories».

Therefore, a recent research is not an exclusive feature of Biogeography; it is shared by all Physical Geography, with sections, such as Hydrogeography or Edaphogeography, that begin to offer now their first thesis. For many decades, Physical Geography was reduced to some chapters within regional monographies; it did not produce any specialized research. Biogeography, in concrete Phytogeography, was also another chapter in regional thesis. It was in the seventies when there appeared the first geographers interested in Biogeography, almost devoted to vegetation, although in most cases they were linked to studying the integral landscape. It was due to the coming into effect of the new curricula and to the society's interest on environmental and Nature defense themes, as well as to the entry of the new geographical trends from other European countries.

In the '80s, the Schools of Geography and History constituted the departments of Physical Geography; they recognized this subject as one of the knowledge areas linked to our Licenciatura. It was in the seventies, however, when some geographers began to lean towards Biogeography through self-teaching.

Even nowadays, in many Geography Schools curricula, Biogeography is not offered or it is included with Climatology in a course. Therefore, there is a clear disproportion with Biogeography reduced to a mere testimony.

Biogeography developed, therefore, outside Geography in Spain. It has been practiced by figures from Botany, Zoology or Paleontology. A Paleontologe, an important contributor to Geo-Botany, and master to all of us was Emilio Huguet

del Villar. He is probably best known by its pioneering works on Edaphology than by its geobotanic studies, although these are still quoted by many foreign biogeographers. His edaphologic studies gave him international reputation and took him to the chair of the European Mediterranean Soils Committee in the thirties.

Other inspirers and teachers for all of us appeared later on; they were Botanists in the Schools of Biological Sciences and Pharmacy and published some Biogeographical papers: Blas Lázaro Ibiza, Pío Font Quer and Salvador Rivas Goday, or Zoologist such as Angel Cabrera. All of them practiced mainly a chorologic Biogeography, that did not interest Geographers; it was only Huguet and Font Quer who approached other views where ecological-physiognomic features are priority.

Huguet del Villar's and Font Quer's interesting contributions were not followed; in the '50s, the Schools of Barcelona and Madrid imposed on Spanish Geobotany other Phytosociological approaches. In the School of Barcelona, the most important figure is Oriol de Bolós, who is author of many and important contributions to the knowledge of our plant landscape; he collaborated in some works with Braun-Blanquet, the creator of the Phytosociological science. In Madrid, there appeared first Rivas Goday and later on Rivas Martínez. The latter, closely linked to the German and Northern France Schools, introduced in Spain the last changes and novelties in Chorology and Bio-Climatology. He also contributed to disseminate Simphytosociology, the evolution from Botanic studies towards more Geographical approaches, since it studies the territorial and dynamic relations between the communities that make up the plant landscape.

Present Biogeographers drink from these two sources, besides from their own knowledge and from Ecology.

We can not talk about groups nor schools. Biogeographers in the Schools of Humanities or Geography and History are starting their own ways, within the curricula's possibilities, and most of them are focusing on geographical aspects of the plant world.

In many cases, biogeographical studies combine with studies on landscape, land planning and, lately, with studies on environmental impact. These studies need to take stock of the natural resources, and they qualify Bio-geographical resources, that is, vegetation and fauna, as being valuable and even frail in Spain; therefore, its study has to contribute to a better land usage and to the creation of protected areas.

The groups of University professors devoted to Biogeography are still small and are found in:

Barcelona. The most important center is the Universidad Central, where María de Bolós published some vegetation studies very early (1964). They dedicate to integral landscape studies with frequent attention to vegetation. Professor Panareda has an almost exclusive dedication to Biogeography; among his working lines are the cartographic aspects and the study of plant sequences after anthropic influence. He is also one of the few geographers that publish collaborations with Botanists.

Madrid. Except for an early work by López Gómez (1955), who has not worked on this area till recently, Biogeography as a research field in Madrid's universi-

ties was not established until the end of the '70s, under Martínez de Pisón's drive. The Complutense University initial nucleus (M. de Pisón, Sanz Herráiz, Bullón Mata) moved into the Autónoma University, where C. Fidalgo joint it coming from said University. Most of the publications follow Bertrand's ideas and methods (basically, Troll, Sochava, etc), and present a landscape focusing, although Fidalgo dedicates also to Bio-climatology.

In the Complutense University, C. Ferreras follows a clear Phytosociological direction; he points out its geographical interest and value. In his last works, Ferreras tries to achieve a synthesis between Bertrand's and Phyto-sociological methods, directed to the analysis of plant landscape state and dynamism. He has also worked on Bio-climatology. The only two publications on plant Biogeography in Spain come from Madrid's Universities.

Canarias. This group appeared during Martínez de Pisón's stay at the Universidad de La Laguna. It shows, as the group at the Autónoma University, a landscape focus and makes use of Bertrand's method. This homogeneous and active group is formed by F. Quirantes, M.E. Arozena, M. Luis, and L. Fernández, among others.

Following a partially different line, E. Pérez Chacón, at the Universidad de Las Palmas, makes use of complex mathematical treatments in his studies of landscape and plant re-colonization after agrarian abandonment.

Sevilla. J.M. Rubio has integrated animal and plant worlds in two works on Biogeography of Spain. He works also on Biogeography Teaching; he has started and coordinated Biogeographers during a recent Workshop on homologation of the Discipline's Contents and Objectives.

Granada. F. Ortega works both on Biogeography's theoretical aspects, on concrete vegetation studies published jointly with the Botanist J. Molero, and on natural spaces planning, together with the Botanists F. Valle and J.L. Rosúa.

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5. POPULATION GEOGRAPHY IN SPAIN. CURRENT STATE AND RECENT DEVELOPMENT

T. VIDAL-BENDITO

INTRODUCTION.

Population Geography is one of the most developed branches of the geographic sciences in Spain today. Despite its recent origins this discipline has made important contributions to the development of population studies in Spain and to an understanding of the Spanish population. It would be neither presumptuous nor exaggerated to claim that without these geographic studies the theoretical and empirical development experienced in the population sciences would have been appreciably poorer in our country. For institutional reasons, the academic study of population was until recently limited to the Geography departments of several Spanish universities. The demographer is still somewhat of a rarity in Spain since demography as a discipline in its own right has, with the occasional exception, no place in the University. Consequently, many of today's experts in the field were introduced to the demographic theories, methods, and techniques through Human Geography. Sociologists, historians, economists, etc., also played and continue to play a vital rôle in population studies. Fortunately, relations between the specialists, regardless of their academic background, within the diversity of demography, have been and remain active and stimulating. A clear illustration of this is the practically indiscriminate participation of all parties in activities promoting the scientific development of the discipline (conferences, publications, etc.). Consequently, to speak of the state of the art of Population Geography takes us beyond the strict boundaries of this discipline, as many geographers work as demographers, while a number of demographers have been integrated into Geography departments, etc.

In short, the study and presentation of the current state and the future prospects of Population Geography is more than justified. However, limitations of time and space mean that here we have had to concentrate on the most readily accessible and important aspects of the discipline.

The excellent studies made by A. García Ballesteros (1985, 1987) of the evolution of Population Geography in Spain, from its first faltering steps to the start of the 80s, means that we shall not consider the early development of the discipline here. However, while these studies were being made and in the period shortly after et, events of far reaching significance for the study of population took place in Spain. At the end of 1983 the first Spanish body specifically concerned with the field of population was founded, namely the «Asociación de Demografía Histórica» (ADEH). Many geographers were to actively participate in its creation and subsequent development. Three years later (in December, 1986) the «Grupo de Población» was set up, within the «Asociación de Geógrafos

Españoles» (AGE) and the following summer the «First Geographic Congress on Spanish Population 1970-1986» was held.

The creation of both bodies represents much more than a mere formality or a vague declaration of intentions. The former has celebrated three conferences and publishes a worthy if modest journal; while the latter group has also celebrated three biennial conferences. The proceedings of these six events, published more or less in their entirety, are not the sole representatives of the work done by Spanish geodemographers, but, undoubtedly, a clear indication of their research interests. Consequently, we shall largely concentrate this study on a consideration of these meetings and the papers presented.

However, other sources will be examined. Firstly, we shall assess recent publications in the field of population studies, especially those made by geographers, which go beyond the strictly scientific concern: books, atlas, etc. Secondly, we shall look at several official bodies recently set up to study population such as the «Centre d'Estudis Demografica de Catalunya» (CED), founded in 1984, and the more recent «Instituto de Demografía» (ID) of CSIC, in Madrid. Both represent a significant advance for progress in population studies and the participation of geographers again is important.

A. García Ballesteros (1985) claimed, and with good reason, that a large part of the scientific study carried out in the field of population had been the work of geographers who were only sporadically interested in the subject. Today, the situation has changed appreciably and there are now a large number of specialists in Spain. The creation and progress of the «Grupo de Población» within the AGE is evidence of this.

One of our main aims here is simply to examine this group of specialists and their work, thereby marking out the path for future studies of greater range and ambition.

SPANISH GEODEMOGRAPHERS AND THEIR WORK

By reading the specialised bibliographies (ADEH, 1988, García Ballesteros, 1985, Vidal Bendito, 1987) and the bibliographies of recent major works (the proceedings of the G.P., and the I.D. and several other recent publications of an eminently geodemographic nature) it is possible to obtain a relatively complete census of geodemographers and to draw a statistical outline of major lines of research and development.

However, a complete census is currently impossible, not because of the number of geodemographers which is still modest, but because of the difficulties in cataloguing and evaluating the researchers and, especially, because of the problems involved in locating rapidly and efficiently many of their publications which appear in a variety of journals. The same applies to the problems in completing a rigorous and exhaustive thematic inventory. In spite of these problems we recognise the need to accept the risks involved in presenting what is an inevitably hasty picture of the «state of the art» of Geodemography in Spain, based on the understanding that this is a rapid sketch rather than a scholarly work. Consequently, it is inevitable that not everyone nor everything will appear in the picture, and that parts may remain in shadow or poorly drawn.

To achieve these aims a computerised data base, compiled on an «ad hoc» basis, was used to classify the names and research activities of those geodemographers who have been repeatedly associated with the major events in the field of population from 1975 to the present day.

THE CENSUS

Throughout the above mentioned publications, bodies, and conferences there appears a long list of people who have participated to a greater or lesser extent in the development of Spanish Geodemography. Such a list would cover dozens of pages and even if the complex task, ridden with possibilities of error, of removing the «non-geographers» were to be undertaken, we would still be left with an excessively long list. Consequently, a simplification is proposed, albeit at the risk of criticism, which converts the general census, into a census of those who have made the most significant contribution. To make such a selection on the quantity of work produced is simple, but to incorporate qualitative criteria would, despite the obvious interest, be impossible under the circumstances. Therefore, our census is based principally on the «frequency» of participation (number of publications, participation in organizations, teaching, etc.) and only in a few cases have certain subjective criteria led us to include or exclude persons whose presence or absence from the list was not totally justified by quantitative criteria. The minimum criterion has been to include every geographer whose name appears several times in the main activities (conferences, publications, etc.) related to the study of population. According to this criterion there have been (since 1975) or there currently are 100 practising geodemographers. Of these 20 stand out for the quantity of their contribution.

The names of these are as follows.

<i>Name</i>	<i>City, Institute</i>
ABELLAN-GARCIA, A.	Madrid, CSIC
BARRIENTOS-ALFAGEME, G.	Extremadura, Univ.
BEL-ADELL, C.	Murcia, Univ.
BIELZA-DE ORY, V.	Zaragoza, Univ.
BURRIEL-DE ORUETA, E.	Valencia, Univ.
CABRE-PLA, A.	Barcelona, CED y Univ.
CARVAJAL-GUTIERREZ, C.	Malaga, Univ.
FERRER-REGALES, M.	Navarra, Univ.
GARCIA-BALLESTEROS, A.	Madrid, Univ.
GOMEZ-FAYREN, J.	Murcia, Univ.
GOZALVEZ-PEREZ, V.	Alicante, Univ.
HERNANDEZ-BORGE, J.	Galicia, Univ.
MARTIN-RUIZ, J.F.	Canarias, Univ.
OLIVERA-POLL, A.	Madrid, Univ.
PASCUAL-DE SANS, A.	Barcelona, Univ.
PUJADAS-RUBIES, I.	Barcelona, Univ. y CED
PUYOL-ANTOLIN, R.	Madrid, Univ.
ROQUER-SOLER, S.	Barcelona, Univ.
SALVA-TOMAS, P.	Baleares, Univ.
VIDAL-BENDITO, T.	Barcelona, Univ.
VINUESA-ANGULO, J.	Madrid, Univ.

We are not unaware of the dangers of such a selection, however, we have accepted the challenge, not so as to honour those who are included nor disparage those who are not, but merely to be informative.

The list includes some who are somewhat removed today, albeit we hope only temporarily, from the field of geodemography; while the names of some who played an important role before 1975 are missing. Amongst the latter it is essential to note the names of Casas Torres, J.M., and Barceló Pons, B.. Also missing are several of the younger researchers in the field. The reasons for inclusion and omission are, as already stated, basically statistical. We reiterate that we have based our list on determined publications and conferences during a given period. In short, we have tried merely to present a list which will be of assistance to those in the future who wish to research in greater depth the Geodemography of the last decades of the 20th century in Spain.

Taking this list it is possible to sketch out the semblance of differing groups or schools of research. Firstly, based on joint publications, it is worth noting the close «ex aequo» collaboration over a period of time between Cabré-Pujadas, Bel-Gómez and Abellán-Olivera-Vinuesa. Secondly, based on the supervision of doctoral theses, research work, etc., several leaders or founders of schools may be identified: Barceló Pons (Balearics), Burriel De Orueta (Canary Islands-Valencia), Cabré Pla (Barcelona), Casas Torres (Saragossa-Madrid), Ferrer Regales (Navarra), García Ballesteros (Madrid), Puyol Antolín (Madrid), and Vidal Bendito (Barcelona).

RESEARCH INTERESTS

The data base, comprising the publications of those considered to be the most notable geodemographers in the last 15 years, enables a rough statistical analysis of research interests to be made. This has been done using the best known consolidated demographic classification - the «Population Index» (P.I.).

Although this classification adapts with some difficulty to certain specific geographic features, e.g. the question of population distribution, we have considered its use to be appropriate without modification. The only change made is a mechanical one; we have substituted the decimal numeration for two digits to facilitate computer handling. For example the category F. 4.1 becomes F41 and G.2 becomes G20.

The most frequently studied research areas are the following, taken from a population of some 300 publications.

As can be seen, a quarter of the publications refer to regional monographs of a general character describing regions in the strict sense of the word as well as smaller areas. Further on we shall provide a more detailed analysis of this research, indicating the type of spatial framework worthy of attention and listing the most studied regions in Spain.

This is followed in importance by two research areas showing a very similar degree of interest for geodemographers. The first refers to migration and the second to biological (age, sex) and socioeconomic (main economic activity) structures.

Initial	Definition	% - acc.
B	Regional studies of a general character	25 - 25
H	Migration	18 - 43
J	Demographic and socioeconomic studies	18 - 61
D	Population development	10 - 71
C	Spatial Distribution	9 - 80
A	General topics: theory, global studies	4 - 84
K	Population and resources	3 - 87
N-O	Methods and data sources	3 - 90
I	Historical Demography	3 - 93
F	Fertility	2 - 95
Others		5 -100

acc = accumulated percentage

In third place appear those studies related to change; the medium and long-term evolution of the population, and, surprisingly, in a discrete fourth position are those areas considered to be most geographic; those of population distribution.

The remaining categories are less relevant; although the apparent lack of interest in general areas, such as theory and methodology, and for the traditional concerns of demographic analysis - fertility and mortality - is noticeable. Particularly noteworthy is the almost complete lack of interest shown for marriage rates and the family in spite of their current importance in the field of demography.

An initial conclusion, in view of this information, might be that Spanish geodemographers are more interested in those research areas which have always been considered exclusive to the discipline: the description and analysis of major population events in a given spatial framework.

However, it is somewhat reckless to draw definitive conclusions from such a crude classification without offering more details. Consequently, we shall analyse in a little more depth these major areas of research.

To begin with we shall examine what lies hidden behind the apparent lack of concern for theory and studies of greater scope and range. A detailed analysis of items A and B happily reveals that the contribution from Spanish geography to the population sciences has been highly significant. Geographers such as Casas Torres (1982), García Ballesteros (1982), Ferrer Regales (1975) and Puyol Antolín (1982, 1984) have written some of the most valuable syntheses of world population to be originally published in Spanish. The same applies to global studies of the Spanish population. Puyol Antolín (1988, 1989) is author of the most extensive and complete studies recently undertaken on the Spanish population and Vinuesa-Olivera-Abellán (1981, 1982) made an interesting descriptive and methodological study on the same theme more than a decade ago.

Also in the B10 items - wide-ranging regional studies - the contribution of geographers is highly important. However, there exists a noticeable imbalance in the quantity and intensity of geodemographic study made in the different Spanish regions. Some, such as Catalonia, have been studied in numerous works of a high level, while the general characteristics of others have scarcely been examined. In

the next section we shall examine the degree of development reached by these regional studies.

REGIONAL STUDIES

In spite of the fact that our data base is incomplete and biased (including only the most prolific authors since 1975) an extraction of data referring to the spatial framework of geodemographic research reveals interesting results.

Taking the 17 Autonomous Communities as regions the geodemographic research has been approximately distributed according to the figures in the following table.

Geographic Framework of Research

REGION	REG.	PROV.	COM.	MUN.	SEC.	TOTAL (%)
CATALONIA	25	0	10	1	12	48 (18.2)
ANDALUSIA	13	9	8	0	5	35 (13.3)
MADRID	4	=	0	0	21	25 (9.5)
CANARY ISLANDS	11	1	10	1	0 2	3 (8.7)
MURCIA	14	=	2	5	0	21 (8.0)
BALEARICS	16	=	3	1	0	20 (7.6)
GALICIA	8	4	1	0	1	14 (5.3)
CASTILE-LA MANCHA	4	6	4	0	0	14 (5.3)
CASTILE & LEON	5	2	3	2	2	14 (5.3)
ARAGON	6	5	2	0	0	13 (4.9)
VALENCIA	6	4	3	0	0	13 (4.9)
EXTREMADURA	5	4	0	0	0	9 (3.4)
BASQUE COUNTRY	2	2	0	0	1	5 (1.9)
ASTURIAS	2	=	1	0	0	3 (1.1)
NAVARRRE	3	=	0	0	0	3 (1.1)
CANTABRIA	2	=	0	0	0	2 (0.8)
RIOJA	1	=	0	0	0	1 (0.4)
Total	127	37	47	10	42	263 (100)

REG. : Regional Studies (all items)

PROV. : Provincial Studies (all items)

COM. : «Comarcal» Studies - subdivision of provinces (all items)

MUN. : Municipal Studies (all items)

SEC. : Sectorial Regional Studies (only rural population, all items)

= : Autonomous Communities in which region and province coincide.

The first conclusion that can be drawn is that the number of geodemographic studies made is neither related to the area nor to the population of the Communities. In the first case the correlation is minimal and in the second, although stronger, it is far from perfect. The three most populated Communities (Andalusia, Catalonia, Madrid) are the most frequently researched but the next three Communities have meager populations (Canary Islands, Murcia, Balearics) while large regions such as Castile and Leon lag far behind in the ranking. The number of studies depends more on a random development in time and space of researchers and schools of research than on other factors. In the Balearics, for example, in spite of the only recent creation of a University department of

Geography the number of studies is high. A further influence is the degree of regional identity expressed by the people of each Community. For, example, the strong national feeling of the Catalans is reflected not only in the high number of studies but also in the spatial frameworks chosen: the region and the «comarcas» (subdivisions of provinces). A fifth of the studies made in regions and «comarcas» correspond to Catalonia.

The degree of economic development also has little influence. Murcia and the Balearics, with highly differing degrees of wealth, have similar numbers of geodemographic studies.

Institutional initiatives have played an important part in the development of population studies in several Communities. In Catalonia the Institut Català d'Estadística (formerly CIDC) and the Centre d'Estudis Demogràfics (CED) have created many professional opportunities for geodemographers outside of the university.

Further analysis shows that the degree of geodemographic knowledge of the various Communities is, as well as being unequal, highly heterogeneous. In nearly all the Autonomous Communities great efforts have been made in recent years to assert individual geographies and histories. Thus atlas, encyclopaedias, histories, etc. have been published or are being published in which chapters dedicated to the population are almost always included. However, the quality of these popular studies is very uneven. In some cases a thorough research based on a sound methodology has been made, while others have a very rough-and-ready appearance.

In short, the geodemographic understanding of the Spanish regions is still incomplete. Large areas and important periods of the second half of this century have yet to attract the interest of geodemographers. The contributions made by other researchers of population do not and never will compensate for this neglect. Consequently, geographers should recover the notable and historic project of Casas Torres (1956) and adapt it to the needs of the present day. Today, the conditions for carrying out an initiative of this nature are infinitely better. The number of geodemographers is much greater, official demographic statistics are increasingly more complete, reliable and accessible and, furthermore, computer technology can process the data in ways which a short time ago were unthinkable. With the support of those official bodies responsible for data collection and processing and with a common methodology the scientific production in population studies could be quantitatively and qualitatively much greater than it stands at present. The methods and techniques used to date have been guilty of being heterogeneous, so that any comparison between areas or periods studied by different authors has not always been easy, and, frequently, duplicate or similar research has been undertaken without reference to each other.

However, such a normalization of methods and techniques should be related to a rationalization in spatial hierarchies and interconnections. The structure and the dynamics of the population in a given area cannot be explained if its relations with other areas are ignored and standard analytical techniques cannot be used in the analysis of small communities. Each type of spatial framework necessitates a different treatment. Little work has been done in this domain, exclusive to

Geography, neither in Spain nor abroad, but, in the Spanish case, the complex Iberian spatial pattern requires urgent attention.

CONCLUSION

The Spanish Geographer's interest for population studies broke out of the restricting stays of traditional regional studies some twenty years ago; and the study of population went from being just a necessary chapter, among many, to being the most important focus in many geographic works. Meanwhile, the figure of the Geodemographer began to develop during the 70s so that today we can identify a large number of specialists working together in one body, the «Grupo de Población» within the AGE.

This major development in geodemography has had a special impact on the Spanish social sciences. The teaching of demographic methods and techniques was for many years the almost exclusive domain of university Geography so that a large part of the studies of the Spanish population have been made by geographers.

However, despite these undoubtable merits in the field of geodemography there are also some causes for concern; most notably, the poor coordination of research work and an excessively diverse methodology.

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- N.B. The bibliography includes those publications cited in the text as well as others of particular interest in the field of Spanish geodemography.
- Abbreviations used in the text:
- ADHE = *Asociación de Demografía Histórica*.
- AGE = *Asociación de Geógrafos Españoles*
- ASEC = *Atlas Sòcio-econòmic de Catalunya*. Edited by T. Vidal Bendito.
- BADHE = *Boletín de la Asociación de Demografía Histórica*
- CED = *Centre d'Estudis Demogràfics*. Universidad Autónoma de Barcelona y Gobierno Autónomo de Catalunya.
- CIDC = *Consorti d'Informació i Documentació de Catalunya*. Later to become the ICE.
- CSIC = *Consejo Superior de Investigaciones Científicas*.
- E.G. = *Estudios Geográficos*. Quarterly journal edited by CSIC and the Instituto «Juan Sebastian Elcano». Madrid.
- G. P. = *Grupo de Población* de la Asociación de Geógrafos Españoles».
- ICE = *Institut Català d'Estadística* del Gobierno Autónomo de Catalunya
- I.D.=*Instituto de Demografía*. CSIC. Madrid.
- IEGA = *Instituto de Economía y Geografía Aplicadas (Departamento de Geografía Humana y Regional)*. CSIC. Madrid. Publica: *Documentos de Trabajo*.
- P.I. = *Population Index*. Office of Population Research, Princeton University. Population Association of America, Inc. Publicación trimestral. Washington D. C.

6. THE RURAL WORLD

A. GIL-OLCINA

There exists an almost unanimous opinion that its rural branch has made the most significant contribution to Spanish Geography; but, at the risk of undermining the other branches of the discipline, whose work has also been prolific, suffice it to say that its contribution has been indisputably among the largest and most valuable.

The importance of rural geography has come about as the result of a number of facts and circumstances. Firstly, the significance of the rural world in Spain at the start of the second half of this century should be emphasised; not only for the high percentage of agricultural workers in the working population or the essential contribution made by this sector to the gross national product, but also, and more relevantly, because a large part of the nation was immersed in, or closely tied to, the rural world. Geographers are no exception to this and have shown a profound interest in rural matters.

Up to the 70s there was a clear preponderance of regional studies among doctoral theses. With few exceptions, a considerable part of these studies, and usually the longest chapter, was dedicated to rural geography. Among the most outstanding of these numerous theses are Floristán (1951), Rosselló (1964), Gil (1971), Morales (1972), Villegas (1972), Cano (1974), López (1974), Ocaña (1974), Ortega (1974), Frutos (1976), Rodríguez (1977), Saenz (1977), Zulueta (1977) and Gozávez (1977). Other theses are dedicated entirely to agricultural geography while in others it is the most dominant theme due to the region being studied; a sample of the best of these includes Burriel (1971), Calvo (1975), Ortega (1975), Sancho (1979), Cabero (1980), Arroyo (1981), Quirante (1981), Molinero (1982), Domingo (1983), Rodríguez (1984) and Valle (1985).

Owing to limitations of space, it is impossible here to make an exhaustive or even a complete study of the vast geographic contribution to our understanding of the rural world. Consequently, this work offers a synthesis of some of the most outstanding contributions which have led to the consolidation and flourishing of rural geography in Spain in the second half of this century.

The Spanish contribution to the XX International Geographers' Conference (London, 1964), consisting largely of articles related to agricultural issues, immediately preceded the *I Coloquio de Geografía Agraria*, held in Salamanca a year later. One year after this, a book containing important contributions to rural geography was published in Madrid in honour of Don Amando Melón y Ruiz de Gordejuela on the occasion of his retirement.

A decade later, García Fernández published his splendid study on *Los Paisajes Agrarios de la España Atlántica*. This book together with the brilliant contribution made by those geographers invited to the *Seminario de Historia Agraria*, sponsored by the «Fundación J. March», in 1977, were essential for the organization of the *Seminario sobre Paisajes Rurales de España*, sponsored by the same foundation and directed by García Fernández in 1978. The latter was to

write in the prologue of the book, a collection of these seminar papers and communications; «...practically for the first time ever, a publication has brought together, a collection of studies based on the same question related to the different regions of Spain and following different geographic approaches, its value lying not only in its contribution to an understanding of the richness of rural landscapes in the country, but also as a record of the current state of our Geography» (García Fernández, 1978, 6).

Several of the published papers examined in considerable detail the creation of land ownership patterns and the evolution of land holding patterns. The intense interest shown by the participants for this research area at this Seminar held in 1978 led to the *Coloquio sobre la propiedad rústica en España y su influencia en la organización del espacio*, which took place in Alicante in December 1980, and was attended by specialists from 22 Spanish universities. The Proceedings, entitled *La propiedad de la tierra en España*, represent one of the most important contributions to the geography of rural Spain.

This was to be the first monographic conference held on land ownership in Spain, but, strictly speaking, it should not be given the preeminence within Agricultural Geography it was to be implicitly given some years later. There are two reasons for this; firstly, its content, because of a greater specialization, acquired a more limited nature; and, secondly, because of the unintentional, but unjust, omission, of the symposiums held in Salamanca (1965) and Madrid (1978). However, the year 1980 was to be particularly fruitful for rural historical geography as it was in this year that García Fernández published *Sociedad y Organización del espacio tradicional en Asturias*.

Research into rural land ownership was further strengthened during a symposium entitled *Estructuras y regímenes de tenencia de la tierra en España*, organized, at the Universidad Internacional de la Rábida, in 1983, by the Geography Department of the Universidad de Sevilla. However, the *III Coloquio de Geografía*, organized by the Department of Geography at the Universidad de Extremadura was to have a more varied programme (Jarandilla de la Vera, 1985), and was to inaugurate the biennial celebration of the meeting, which has so far been maintained by the research group; *Grupo de Trabajo de Geografía Rural* of the Asociación de Geógrafos Españoles. Subsequent *Coloquios de Geografía Rural* have been held in La Laguna (1987) and Santiago de Compostela (1989) thanks to the efforts of their respective Geography Departments; while the *VI Coloquio de Geografía Rural* of 1991 was held at the Universidad Autónoma de Madrid. The result of these symposiums has been the consolidation of a research group with a defined line of research which today enjoys an enviable vitality.

Before the *VI Coloquio de Geografía Rural*, a meeting was held in Alicante in May, entitled *Medio siglo de cambios agrarios en España (1940-1990)*, planned by the Universidad Internacional Menéndez Pelayo, sponsored by the Instituto de Cultura Juan Gil Albert and organized by the Instituto Universitario de Geografía de la Universidad de Alicante. The meeting focused on changes within agriculture during this period, but did not overlook other closely related fields such as the evolution of Spanish livestock, forestry and cynegetic geography.

This study, which in no way professes to be exhaustive, is based on a series of short reviews, necessarily brief, which recognise the most important contributio-

ns in each of the respective fields and, hence, to rural geography as a whole. The sections included are as follows: a commentary on the use of primary sources, livestock and crop evolution, irrigation and other hydraulic uses, land holding and ownership patterns, property and ownership of spring waters, rural population and its distribution, and, finally, a chapter entitled «Half a century of agricultural change in Spain: From autarchy to the single European market.»

A COMMENTARY ON THE USE OF PRIMARY SOURCES

The role played by geographers in the discovery and systematic investigation of a wide variety of primary sources related to the rural environment has been particularly great. The main focus has been on documents related to the last three centuries, but older sources have not been ignored, eg, tax assessments, tithe books, «establiments», «stims», «cabreves» and «giradoras», among others.

Spanish geographers have given special attention to the *Interrogatorio para el establecimiento de la Unica Contribución* or *Catastro de Ensenada* (mid 18th century land register), the importance of which is well-known. This rich source has been the inspiration for many geographers and historians, who have placed great importance on it, including Melón (1949) and Cabo (1957). However, until Camarero Bullón (1987) presented his thesis there was a lack of detailed and reliable information about the procedure and practice of verifications for the drawing up of this land register. There are some 80,000 original volumes and innumerable drafts comprising the fiscal primary sources. These include the «Libros de lo real», «Libros de los cabezas de casa», «Memoriales de los vecinos», «Libros del mayor hacendado» from each village, «Libros de lo enagenado» of the Royal Treasury and, of course, the «Respuestas Generales». This latter source forms the basis of the collection entitled *Alcabala del Viento*, which, under the directorship of Camarero Bullon and with the collaboration of both historians and geographers, has undertaken the ambitious scientific and publishing project of presenting, along side introductory studies, the replies received in the main districts of the Kingdom of Castile.

Also worthy of note is the research carried out on the «Cadastre» for Catalonia and the Balearics, entitled «Libros Padrones de Riqueza», a document drawn up in the former kingdom of Valencia for the collection of the «Equivalent» tax (Mata and Romero, 1988), as are various sources used in analysing processes of alienation of property as well as others belonging to the present century. Among the latter the Congresos Nacionales de Riegos (National irrigation conferences) and the Registro de Propiedad Expropiable (Register of Expropriable Land) are the most important; not forgetting the «Libros de Aguas» and «Nóminas de Interesados en Aguas», which have controlled the authority and property of water on irrigated lands suffering a shortage of water and where the water is owned separately from the land (Gil, 1985).

For the first time ever, as far as can be verified, López Ontiveros, during the meeting of the Universidad Internacional «Menéndez Pelayo» held in Alicante at the end of 1990, presented an overview of the five national irrigation conferences held respectively in Zaragoza (1913), Sevilla (1918), Valencia (1921), Barcelona (1927) and Valladolid (1934). This paper made evident that the proceedings of these conferences constitute both a fundamental and indispensable source for an

understanding and study of a wide range of hydraulic and related questions in the first third of this century.

Researchers in the field of rural geography have also been responsible for the use of the «Registro de la Propiedad Expropiable» as a statistical source, having brought to light the implications within the register of the results of the «Ley de Bases» on the Agricultural Reform of 15th September, 1932, and having carried out the first exhaustive studies of a regional nature (López, 1980; Romero, 1983).

The frequent use made of notarial protocols and mortgage records by rural geographers should also be noted, even though the essential source for this analysis is primarily through the Land Registers, created by the Mortgage Law of 8th February, 1861, which together with its Bylaw, came into effect on 1st January, 1863.

This brief sketch, almost telegraphic in form, can only highlight a few of the most significant examples of the wide range of primary sources used in this field.

LIVESTOCK AND CROP EVOLUTION

It is of little surprise that the livestock sector should have attracted such interest among Spanish geographers in the light of the following: the traditionally high contribution of the sector to agricultural income, its full insertion within the rural way of life, its great historical importance, as well as its significance in specific agricultural areas and systems, and, especially, the large merino flocks of the past and the related wool trade, the influence of the Meseta (Klein; 1936), networks of cattle tracks and paths, grazing land in the western peneplains or the exploitation of the pasture of the north of Spain and the uplands. Some of the many areas which have come under research include; conflictive land use (López-Salazar, 1983), the evolution of Spanish livestock (Cabo, 1960), the world of transhumance (Teran, 1947; Fontavella, 1951; Miralbes, sic; García, 1973), as well as specific types of farming (pasture, Basque «caserios») in which cattle raising is of particular importance (Martín, 1966 and 1968). There have even been doctoral theses specifically dedicated to stockbreeding, analysing the most significant historical events which have led to the present-day situation (Torres, 1971).

Few regional studies fail to include at least one section examining crop evolution, illustrating the substitution of one crop type for another or the changes in their respective relative importance. However, there exists much less research dedicated to just one crop, although there are some excellent examples; these include the monumental work of Huetz de Lempis (1967) and an excellent study made by Piqueras (1981) dedicated to viticulture, as well as the book of Morales Gil (1976) on the zone of Jumilla.

On the contrary, articles related to crops which are notorious for various reasons are more frequent. García Fernández (1987), for example, has written about rice production and its expansion during the 18th century in the coastal plains of the Gulf of Valencia; in more recent times however, rice production in Valencia has declined, being replaced in importance by the Marismas del Guadalquivir (Zoido, 1973).

López Gómez, author of many varied works, has dedicated two excellent articles of historical geography to the land of Valencia. The first refers to the incidence of climatic changes on the cultivation of sugar cane with the coast of Castellón marking its northern peninsular border (1972), while the second traces the introduction of maize into the former kingdom and its progressive advance at the expense of other cereals (1974).

Studies in historical geography which examine crops which have now disappeared, albeit of great importance in the past, are also worthy of mention, such as the sumach, «paleras» or «tuneras», mulberry, and «plantas barrilleras» (Cabo, 1966; López, 1980; Gil, 1975).

Many parts of Spain have experienced important changes, even radical transformations, in crop distribution in the second half of this century (García; 1976). Special mention should be made of the Mediterranean coast in the south and south-east of the Peninsula, where a potential energy of some 3,000 annual sun hours, the mildness of the winters and the rarity of frost have permitted the introduction and expansion of new subtropical crops (García, 1972), early crops (Bosque, 1964) and forced crops using new plastic cloches.

IRRIGATION AND OTHER HYDRAULIC USES

With Brunhes work (1904) setting a magnificent precedent, the publications of Spanish geographers, half a century later, on the origins and the evolution of the country's irrigation systems, with particular reference to hydraulic works, have made a highly important contribution to Spanish agricultural geography, and particularly to its historical development.

The invaluable study made by López Gómez entitled *Riegos y cultivos en la Huerta de Alicante* (Irrigation and crop production in the Huerta of Alicante) might be considered as the first of these. It appeared in 1951 in the journal *Estudios Geográficos* and was to be followed in 1957 by *Evolución agraria de la Plana de Castellón* (Agricultural change in the Plana de Castellón), written by López Gómez at a time when he had already set up a research group which was to carry out a wide ranging and thorough study of the irrigation systems of the east of Spain (Rosselló, 1964; Pérez Puchal, 1968; Gil Olcina, 1971; Burriel, 1971).

The climatic problems of the driest region in the Iberian Peninsula, that is the south-east, attracted the attention of Llobet (1958) and Vilá (1961), and later also of the geographers at the universities of Murcia, Granada and Alicante, above all Morales Gil (1968).

The work of López Gómez is of great interest to rural geography. His work includes an article written in 1971 entitled *Embalses españoles de los siglos XVII y XVIII en Levante* (Spanish reservoirs of the 17th and 18th centuries in the Levante), a study made in 1972, which might be considered as a continuation of the former, *Embalses españoles de los siglos XVIII y XIX* (Spanish reservoirs of the 18th and 19th centuries), and a book published in 1987 *Els embassaments valencians antics* (Old Valencian reservoirs). Among López Gómez's many publications also figure studies of the origin of the Valencian irrigation systems (1974 and 1975), «La presa y el canal del Guadarrama al Guadalquivir y al

Océano» (1989) (The dam and Guadarrama Canal to Guadalquivir and to Ocean) and *Antiguos riegos marginales de Aranjuez* (1988) (Old marginal irrigation systems of Aranjuez), the latter being a speech given on being made a Member of the Spanish Royal Academy of History.

In this brief and regrettably incomplete summary, we should also mention *Los paisajes del agua* (1989) (Landscapes of water), a book published by the universities of Valencia and Alicante in honour of Professor López Gómez on his retirement, as well as the Universidad Internacional «Menéndez Pelayo» seminar held in the first week of November, 1990, significantly entitled *Hitos históricos de los regadíos españoles* (Historic landmarks in Spanish irrigation), with papers being read by Morales Gil, Box Amorós, Gil Olcina, Gómez Mendoza, López Ontiveros, Ortega Cantero and Cano García.

LAND HOLDING AND OWNERSHIP PATTERNS

Studies of land holding and ownership patterns have been a traditional area of research within Spanish historical geography. Examples of this up to the mid-1950s include the research of Casas Torres into the property resulting from the «aterramientos» in Albufera in Valencia (1943) and studies of agricultural collectivism in the mountains of Burgos and the region of Sayago by López Gómez (1954) and Cabo Alonso respectively (1956).

Following these a series of studies into the processes of land alienation, from the sale of uncultivated and common land in the 16th century to the huge auctions of the 19th century stand out. These research areas have been studied in important works by, among others, Floristán (1966), Quirós (1964), Gómez Mendoza (1967), Cámara (1964), Sánchez Zurro (1970) and Zulueta (1975).

At the Seminar entitled *Paisajes Rurales de España*, held, under the direction of García Fernández, in 1978, in the Fundación J. March, several of the papers and talks examined in some detail the origin of land ownership patterns and the evolution of land holding patterns. The interest shown for these matters by the participants of the aforementioned symposium gave rise to a meeting entitled «La propiedad rústica en España y su influencia en la organización del espacio», which took place in Alicante, in December, 1980.

As a direct result of these two meetings, the thesis gained strength that land holding patterns, far from being a simple and a mere consequence of land ownership patterns, effectively intervene in the configuration of the latter, guiding their evolution in one or another direction. This theory, present in *La propiedad señorial en tierras valencianas* (1979) was to be reasserted in *Residuos de propiedad señorial en España. Perduración y ocaso en el Bajo Segura* (1988), as well as *Declive y ocaso de la enfiteusis señorial valenciana*, in which, it is asserted that: «Only those who have not seen the notarial protocols, the mortgage records, nor the books of the Land Register of the territories comprising the former kingdom of Valencia would be able to deny the high degree of long leases in the origin of ownership patterns on the formerly established estates; the consolidation of ownership, one way or another, fully imprinted the surface pattern.» (Gil, 1988, 317). Moreover, the studies indicate the interest which has been shown in the property of the former aristocracy, both within these publications as in others of more recent years.

Some of the participants at the meeting held in Alicante later presented doctoral theses centred on issues relating to land ownership and its legal exploitation. Following the precedent of the well-documented study made by Cruz Villalón, *Propiedad y uso de la tierra en la Baja Andalucía, siglos XVIII-XX* (1980), it is worth noting, the detailed comparative study of Romero González *Propiedad Agraria y Sociedad Rural en la España Mediterránea. Los casos valenciano y castellano en los siglos XIX y XX* (1983). Based on a richly documented study, Romero González considers, from two distinct points of view, the impact of the abolitionist, disentanglement and alienation provisions which were carried out between the Decree on the aristocracy of 6th August, 1811 and the Law of General Alienation of 1st May, 1855, without forgetting the later resolutions and agreements, with the copious case law raised by this.

The excellent thesis by Mata Olmo, *Pequeña y gran propiedad agraria en la depresión del Guadalquivir (siglos XVIII-XIX)* (1987) is worthy of note and, is without doubt one of the largest and most important contributions to an understanding of land ownership in Andalusia. The study discusses the formation and consolidation of large landholdings in Andalusia, which Carrión and later Malefakis attributed to christian repopulation, a theory which Mata Olmo reveals as being unmaintainable today, by revealing the complexity of the phenomenon and by examining the rôle of the aristocracy in early medieval times, property sale by the crown in the 16th and 17th centuries, the secular privatisation of publicly owned property and ecclesiastic alienation. Moreover, without denying the importance of the latifundium system «as an expression of the territory and of agriculture in Andalusia as a whole, this study has also aimed at revealing the existence of a functioning and widespread system of small property», according to Mata Olmo.

Of similar importance is Ferrer Rodríguez's exceptional reconstruction of land divisions within the municipality of Alhama in Granada in the 18th century (1975), based on information drawn from the «Catastro de Ensenada», and which was later to be incorporated into his excellent thesis *Paisaje y propiedad en la tierra de Alhama (Granada, siglos XVII-XX)* (1982); we should also make mention here of Bosque Maurel, teacher of Ferrer Rodríguez, and his publication entitled *Latifundio y minifundio en Andalucía Oriental*. Moving out of Andalusia and into the peneplains of Salamanca, research into the evolution and historical background of pasture in Salamanca has resulted in notable studies made by Cabo Alonso (1978) and García Zarza (1978).

The unanimous wish on the part of those attending the meeting in Alicante to continue these symposiums resulted in the II Coloquio - *Estructuras y regímenes de tenencia de la tierra en España*, held in the Universidad Internacional de La Rábida in 1983. Seven years later, and indicating that this problem had not ceased to be of interest, Naranjo Ramírez (1991) presented his thesis at the University of Córdoba, under the supervision of López Ontiveros. The thesis, an exhaustive and brilliant comparative analysis, examined *La propiedad agraria en dos señoríos cordobeses: Fernán Núñez y Montemayor*.

We cannot conclude this brief review without at least mentioning the geographic-archaeological studies of Roman centurations in Spain (Rosselló et alia, 1974).

PROPERTY AND OWNERSHIP OF SPRING WATERS

The spring waters of the best-known rivers of Alicante and Murcia (Montnegre, Vinalopó, Mula, Guadalentín) were, and some indeed remain so to this day, private property. This separation of the respective ownership of waters and land came about in those large areas of traditional water shortage such as Alicante, Elche, Mula and Lorca, as well as smaller areas. The system was based on a pronounced imbalance between the scarcity of the water resource and vast lands needing to be irrigated.

The issue has not been free of controversy, in the form of lawsuits, questioning the right to acquire ownership of spring waters. Those opposed to their ownership maintained that the waters should be used in irrigation. Their ownership, carefully registered in beautifully kept «Libros de Aguas», initially in the «Contadurías de Hipotecas» and later in the Property Registers, however, represented a source of power for the privileged classes who controlled and sought benefit from them. Removed from free circulation by right of primogeniture, institutions of the secular clergy, religious communities and councils, the market for spring water was always very scarce and prices extremely high. From this sprang the unusual incidence of alienation decrees and, in the longer term, the suppression of the rights of primogeniture.

Ownership of the waters gave the periodic right to enjoy, during a given time, a fraction of the resource. The prices for a measure of water were always set very high, according to its profitability, which in turn, depended on the frequency with which, by virtue of the reserves, its use could be auctioned for irrigation. Daily bids reached astronomical levels; a good example of this is the price of 10,400 ducats paid for a «casa» (a measure of water) in the upper Guadalentín, in 1612, by a merchant from Genoa, Tomás Digueri.

The rights over spring water guaranteed a reliable and high income in contrast with the aleatory and often meagre returns from the best unirrigated land. Moreover, the price paid for the water was usually highly remunerative, and, especially so when in time of drought; thus, ruinous years in dry farming and very difficult years for cultivators of irrigated land, were excellent for the owners of the waters.

It is of no great surprise therefore that ownership of water was highly desirable and largely concentrated in the hands of the nobility, councils and the clergy. The gradual replacement of one oligarchy for another, its connections and permanence was clearly reflected in the changes of ownership of spring waters of the rivers of south-east Spain. Studies in historical geography have reconstructed the vicissitudes of ownership of water in the large rivers in the south-east of the peninsula (Gil, 1985 and 1987), renowned for their monstrous swells (Calvo, 1968).

RURAL POPULATION AND ITS DISTRIBUTION

Any explanation of the rural environment needs to be made from a historical perspective given that the influence of history and the importance of legal decrees should not be overlooked or underestimated. The classic example of this is the so-called «fuero alfonsino» (Alphonsine Code of Law), which was in force for a four hundred year period in the former kingdom of Valencia, between the «Cortes» of 1329 and the abolition of the «Furs» on 29 June, 1707, and then later

enforced following its reestablishment by Royal Decree on 16 May, 1772, until the Decree of 6 August, 1811. Its influence on the municipal organization of various «comarcas» was enormous; more than 50 municipal districts in the region of Valencia can trace their origin or restoration to the «fuero alfosino», giving rise to those small districts located around Orihuela, Cocentaina, Denia, Gandía and Játiva. However, not all districts under Alphonsine jurisdiction have experienced the same fortune; many became depopulated following the expulsion of the Moors, others did not gain sufficient importance to be designated a municipality, while others having obtained the status were later to lose it (Gil, 1990).

Midway through the 19th century, the promotion of settlements in the interior was given a new legal grounding, as laid down by decrees on agricultural estates. It is worth noting the connection between the «Ley de Desamortización General» of 1 May, 1855 and the laws of 21 November of the same year, 11 July, 1866 and 3rd June, 1868 regarding the setting up of agricultural estates, established largely on former publicly owned land, which had previously been alienated. The setting up of agricultural estates was a response to the desire for population growth and dispersal, together with an expansion and improvement in crop production. These settlements were to have an influence on nearly all the provinces in what was a lengthy process, during which time further regulations were to be introduced; including, the «Ley de Colonización y Repoblación interior» of 30 August, 1907.

Under the protection of this decree 18 estates were established, totalling 11,000 hectares. From the outset, and because of its very organization, the aim had a very small chance of success, being developed on public land of poor agricultural quality, whose cultivable areas had already been the object of arbitrary ploughing (Canales, 1986). Following the Civil War the expansion policy of the cultivable surface area, the creation of new irrigation systems and the foundation of new settlements was to be renewed through the «Instituto Nacional de Colonización» (Ortega, 1972 and 1979; Canales, 1981).

The need to give adequate attention to the rural environment, so closely guarded at times by geographers (Terán, 1951; Zoido, 1979), is, perhaps, now, as a result of its evolution during recent years, more urgent than it has ever been. The rural world is facing rapid change of many of its landscapes and the complete disappearance of others which, in marginal agricultural areas, were the result of many centuries of superhuman effort and adaptation to the physical environment.

The rural environment has generated, at various moments in its research history, many highly significant studies; among these are included; *La vivienda y los núcleos de población rurales de la Huerta de Valencia* by Casas Torres (1944), *La casa rural y la agricultura tradicional menorquina* by Vidal Bendito (1973) and *El hábitat rural en la Sierra de Cádiz. Un ensayo de geografía del poblamiento* by Suárez Japón (1982).

HALF A CENTURY OF AGRICULTURAL CHANGE IN SPAIN: FROM AUTARCHY TO THE SINGLE EUROPEAN MARKET

The major changes in the Spanish rural environment in the last 50 years were the subject of an important and wide-ranging meeting held, last May, in Alicante entitled *Medio siglo de cambios agrarios en España (1940-1990)*. The confe-

rence focused on the agricultural history of this period, but did not overlook other closely related fields such as the evolution in Spanish livestock, forestry and cynegetic geography. The incorporation of these last two lines of research reflected, in the first case, the research carried out and directed by Gómez Mendoza, at the Universidad Autónoma in Madrid, and, in the second case, the research undertaken and guided by López Ontiveros, at the University of Córdoba.

While not pretending to offer an exhaustive analysis, which would have been beyond its scope, the conference papers, viewed in their entirety, nevertheless, offered an important overview. This was achieved by combining studies on different scales, including, together with the global perspective, studies of the regions and comarcas, as well as monographic contributions on the more important crops, technological innovations, the latest agricultural techniques, problems related to water, competition for land use and the recession in the agricultural sector faced by an advance in other sectors of production, particularly the service sector.

The conference succeeded, on the whole, in demonstrating how the creation of new job opportunities, rural migration, a changing demand for agricultural products, local irrigation systems, new technology, the results of agronomic research, changes in land ownership and land holding patterns, processes of commercial integration, improvements and developments in distribution networks, and, finally, the agricultural policy of the European Economic Community have brought about significant changes in Spanish agriculture.

In addition to the rapid reduction in the rural working population, there are many other evident changes: processes of modernization which attach greater importance to capital over work and the land, the bipolarization of cultivations characterized by the coexistence of those of a family nature, with the support of agricultural societies promoting change or other forms of cooperatives, and joint-stock companies with a high volume of business, as well as the rising value of work and land productivity indices, the expansion of early crop cultivation with a high commercial value and a decline in other traditional crops strongly linked to a past of self-consumption and autarchy, the subsidized abandoning of agricultural land to lessen the severity of EEC surpluses and, finally, the measures taken in the protection and defense of the environment which demand agricultural practices which are compatible with these aims.

SOME FINAL REMARKS

As we have shown, the growth and consolidation of rural geography in Spain has been based on a number of favourable circumstances. However, in recent years the situation has changed quite radically to the detriment of continued growth in this field of research, casting doubts even on its maintenance in the medium term.

It is quite evident that the rural world has progressively lost its relative importance in all fields; the most familiar statistics are, perhaps, the rapid decline in the rural working population and the strong drop experienced by the sector in its contribution to the gross national product. But they are by no means the only relevant ones. It is necessary also to consider changes in the way of life, the repercussions on the rural habitat, fundamental transformations in land ownership

and land holding patterns, expansion of irrigation farming, the abandoning of marginal agricultural land, the incorporation of new technologies and the neglect of ancestral practices, the primacy of capital over land and work, the influence of the free market and a deep influence on the rural environment of the urban way of life. The logical result of this transformation may be a shift in interest among new generations of geographers for different issues, which arise not only out of the unquestionable importance of these changes, but out of an increasing withdrawal from the rural world.

Other facts are no less important than these. The positive implications for the development of rural geography of the rich presence, albeit excessive for a balanced geographical education, on former curricula of historical subjects should be highlighted. The weight of these subjects was not unreasonably reduced on the creation of sections and specialities within Geography, and they may even disappear completely in modern degree courses. This would be a grave mistake, if not to say an aberration, because as soon as genetic analysis is abandoned the training of authentic geographers will be seriously weakened. Thus, following a rich and productive period rural geography faces serious challenges in the future; the uncertainties and doubts are already well-known and require a suitable scientific response.

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7. URBAN GEOGRAPHY

7.1. SPANISH CITIES AND URBAN GEOGRAPHY

A.J. CAMPESINO (COORD.)

Considering the small space allotted to us here, we must limit ourselves to a bibliographic overview of Spanish cities, leaving the analysis of the research on urban systems to our colleagues.

We will update and enhance the pre-existing bibliographic outlines on cities (Capel, 1970), and on urban geography from the period of 1950 to 1980 (Carreras, 1984); earlier works free us from dealing further with this period. We will concentrate, however, on the research of the last decade; but because urban geography has been the most fruitful area of study in this period, our goal will be difficult to reach in such a short paper.

The bibliography on urban Spain in the last decade rests upon the contributions from meetings sponsored by the Association of Spanish Geographers (A.G.E.) and held in collaboration with university departments.

At these biannual congresses, thematic concerns are channelled into public discussion and debate. Some of the topics addressed in these congresses have been: Iberian cities and their expansion (AA.VV., 1981), theoretical and methodological aspects of the urban space (AA.VV., 1983), the evolution of cities with regard to migration and population (AA.VV., 1984), the space that surrounds the city (AA.VV., 1985), spatial and social processes in historic centers (AA.VV., 1987), the current dynamics in urban spaces, tourism and territory (AA.VV., 1989), and recent urban changes (AA.VV., 1991).

Despite the absence of a clear systematic organization of themes, urban reports have not lacked in congresses on Iberian geography; they simply appear, on occasion, under more generic titles (AA.VV., 1983a and 1986). In any case, the meetings have channelled research for a good number of qualified urban geographers working throughout the departments of Spanish universities; nonetheless, these geographers vary in number and in the quality of their work.

In all these departments, doctoral and bachelor's theses, that deal with Spanish cities on a regional level, are the essential measure of the productivity of research. These are complemented by journals that clarify and identify the dominant thematic concerns of each department.

Thus, our bibliographic inquiry, although necessarily incomplete, makes note of theses from various geography departments in the last decade. At the same time, it emphasizes various monographs which entail a high percentage of bachelor's theses.

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7.2. STUDIES ON THE SPANISH URBAN SYSTEM

M. FERRER
A. PRECEDO

SPANISH CITY STUDIES

A) The first point that must be stressed is that the classical line of thought inspired by the German and French schools persists in many studies on the Spanish urban system. On the one hand, these works address the relationship between sites, the development of plans, morphology, and urban structure; and, on the other, they deal with the relationship between urban functions and situations and areas of influence. Among these studies, one should note the ones on Valladolid (García Fernández, 1974), and Seville (González Dorado, 1975).

B) In the early seventies, new currents of thought are introduced: they are the same, that informed anglo-saxon geography, and they characterize the work of this decade.

1) The theory of a space central to urban sites is applied to a study on Cuenca and its areas of influence (Estebanez, 1972 and 1974).

2) The theory of the School of Human Ecology in Chicago is assimilated for a study on the metropolitan area of Bilbao. A method for statistically analyzing the functional space of the metropolitan area is introduced, along with indexes for ecological analysis (Precedo, 1977).

3) Aerial photography for geographic research is adopted in both empirical and methodological studies (Precedo, 1979-80); and Sabate, 1981).

4) The quantitative tendency to use multiple statistical techniques develops (Bosque Sendra, 1974 and 1985); the pioneering study of this type is on the city of Granada (Fernández Gutiérrez, 1977).

C) The above mentioned tendencies, developed in Geography Departments throughout Spain, are carried out as partial studies of large conglomerations; considering the large scale of these cities, it is difficult to carry out comprehensive studies. These partial studies can be divided into two kinds of research: one on sector issues (1) and the other on particular spaces in the city (2).

(1) Among the studies in the first group, one should note the analysis of alternating movements (González Yanci, 1977; Casas Torres et alia, 1978; Puyol, 1983), and urban transportation (López, 1976; González Yanci, 1977). With respect to service areas, the main body of work deals with the central municipality and the metropolitan area of Madrid. Madrid is also the object of a large number of studies directed by M. de Terán; these are both joint studies (Teran, 1979), and sector studies (Teran et alia, 1981 and 1982, among others). In many cities, urban population is the aspect that draws the most scholarly attention and is consequently the focus of a great number of projects. Demographic and social space are two areas currently gaining methodological attention (Ocaña, 1988).

(2) It is difficult to offer a complete synthesis of research on particular spaces since there are so many different contributions in this area. Therefore, we will look at a representative selection.

Research on urban centers has followed two paths: one is oriented towards historical centers, while the other concentrates on the functional factor of the commercial and business center. Of the first type, we find abundant publications in journals, and also some from lectures (for ex. X National Congress on Geography, Zaragoza, 1987). Geographers who have worked on particular spaces are certainly not lacking (for ex. Cáceres and Vitoria-Gasteiz). There are also plenty of studies which look at the way in which central sites support tertiary and quaternary functions, but generally these form part of research projects with wide scopes. However, one must mention the book on the urban center of Seville as an exception (de la Vega, 1989).

Although the classical school worked on urban districts, interest in this topic has continued. The new quantitative techniques and theories on social space have been applied to this area. The research undertaken on municipal districts and the outskirts of the metropolitan area of Madrid are notable. They either apply the theory of residential distinctions or they consist of typological surveys of urban morphology (Brandis, 1979).

From the early eighties on, studies on the urban periphery proliferated because during these years the phenomenon of urbanizing the outskirts or rather of suburbanization began to affect not only large cities, but also the medium-sized city. One must note that the precedent for this type of study deals with the second residence in the province of Madrid (Valenzuela, 1977); it is the first study of a territorial nature. The V National Colloquium on Geography, celebrated in 1985 in the University of Murcia, was dedicated to the issue of suburban or peri-urban space (Valenzuela, 1986). It contributed to expand this area of study by introducing related topics of a residential and functional perspective.

d) The importance of Marxist theory in studies on the city in the eighties is a key aspect of Spanish urban geography. Concepts such as space production, value appreciation, center-periphery dialectics, neighborhood movements, and urban restoration became generalities among young researchers. They followed the school of thought initiated by H. Capel (*Capitalismo y morfología urbana*, 1975). This focus produced a wealth of written work (for ex. VV.AA. in Clemente and Marcello, 1984) which increasingly acquired a tone of historicity. One must note the special importance that was assigned to the historical evolution of urban property as an explanation for the malformations of our cities.

e) At the same time, and in response to international trends, not only in geography, but also in the other social sciences, research on new subject matter began to emerge: these topics revolved around the issue of quality of life.

As a result of all types of malformations and deficits that characterize the growth of Spanish cities, the scientific studies produced and here described, had a strong critical tone. Regardless of their epistemological focus, in many cases, they were veritable social denunciations.

In this context, one must note the particular sensibility in studies on the great metropolitan conglomerates, where, given the scale, urban problems were more acute. One also has to take into account, the problems that came with the growth of the suburbs which had their own administrative entities (Vila, Higuera, et alia, 1977). Considering these problems, some urban geographers advocated, both in theory and in practice, the introduction of regional and metropolitan planning.

It is fully understandable that following this phase of uncontrolled city growth, geographers became interested in aspects of quality of life and in new kinds of urbanization.

The main topics of interest became the environment and urban ecology. The precedent for this kind of study was a book on the cities of Navarre (Ferrer, 1981); to a large extent, the author develops a humanistic philosophy on urban ecology. Although the environmental variable is a constant preoccupation for urban studies, and it is given an important role, there has been no specific study of it.

Other areas of concern for geographers are public spaces and urban facilities since these are related to the well being of the urban community (Valenzuela, 1988). Here, one can add, the studies related to perception, theory as well (Estebanez, 1979).

The analysis of new types of urban settlement in large and medium-sized cities is of more recent interest. This topic is treated not only from the point of view of space occupation, but in terms of how new settlements shape new life styles (Pérez Sierra, 1989).

The series of studies on the cities of Galicia is one of the many efforts to integrate the diverse sector focuses with a global vision of the city, which includes the suburbs. New to these studies is the application of a common methodology which allows one to make a comparative analysis of cities in different stages of development (Precedo, 1989, 1990 and 1991, and which fixes the urban phenomenon within the economic system.

Finally, one must mention the contribution that manuals and atlases have made to the knowledge of Spanish urban geography. Among the manuals, the main works and those by J. Estebánez (1988 and 1989). *The Great Atlas of Navarre* is notable for its considerable treatment of the urban material.

STUDIES ON THE URBAN SYSTEM

A) The changes that urban geography experienced in the seventies are evident in the general turn to new issues and methods at this time. The novelties were characteristic of the anglo-saxon school, and they clearly marked a change in the direction of greater specialization. This context explains the sudden inclusion of urban geography in studies on urban networks and systems.

Indeed, there had been a research tradition in Spain that looked at the relationship between the city and the region; more specifically, it determined the areas of influence in the cities according to urban functions. Nevertheless, just as in other countries, the theoretical basis for this work began with the idea of a central site. From the start, there were two focuses: a static one and a dynamic one. The latter became the prominent approach since by applying the theory of systems it became more lively.

The first focus was founded by H. Capel; he introduced studies on the rank-size rule. Earlier he had researched the functional specializations of Spanish cities by using statistics (Capel, 1968), and he had published a pioneering work on the Spanish urban network from 1950 to 1960 (Capel, 1973).

In terms of the dynamic focus on urban networks, the first study dealt with urban systems in the North of Spain (Ferrer et alia, 1972); it was followed shortly after by another volume (Ferrer, 1978). Thereafter, a stream of research was published at the regional and above all the national level. In these works, one detects an evolution towards a systematic understanding of space; in other words, the existing relationships between urban networks, regional development, and territorial organization are taken into account. At the same time, one detects the beginning of greater theoretical comprehension (Murcia, 1978 and 1979).

B) We will classify these contributions in four categories. First, we will note the main areas of research; secondly, regional studies; then, nationwide research; and lastly, theoretical summaries. Naturally, it is difficult to classify studies since most of them include material which overlaps these categories.

Among the most significant topics, one finds the following.

- 1) The study of the historical formations of a settlement system as a result of prior urban inheritance (Ferrer and Precado, 1982 and 1984).
- 2) The relationship between rural population, ecological characteristics, and the density and size of central sites (Precado, 1986). Precado attempted to establish a typology for intermediate settlements; he also related urban dynamics with economic functions and the historical development of the transportation system (Precado, 1988).
- 3) As stated above, the specialization and functional classification of cities was a favorite topic from the very beginning. These studies were mainly based on the structure of the active sector of the population; later, they adopted demographic data which was studied by means of factor analysis.
- 4) As in the previous case, the application of the rank-size-rule also aroused great interest. There is no lack of research on the contents of systems; these gave the rule a dynamic character since they were full of sophisticated information (Juaristi, 1985).
- 5) Studies on population growth in cities and in the different levels of the urban hierarchy were more common regardless of whether they were done on a local or regional scale or whether they dealt with the totality of the Spanish system or not (Serrano, 1983, 1986 and 1988).
- 6) Studies that relate the structure and the dynamics of the settlement system to local development are less common (Precado, 1988).
- 7) One must mention the body of work with a similar focus: studies that relate the dynamics of the urbanization of Spain with economic activity, as well as the urban network with industry siting, and urban dynamics with tertiation (Precado, 1976) in a quantitative framework. Later on, Precado studied the ways in which tertiation had affected the evolution of city systems by undertaking a tertiary classification of metropolitan areas (Precado, 1988).
- 8) As a means of classifying the hierarchic order, the information theory was applied to the analysis of urban network and functional diversity (Juaristi, 1984).
- 9) Sometimes, population aspects of the urban network are studied with a high level of spatial disintegration (Ferrer et alia, 1988); other times, studies focus on

the functional changes as well as those in the urban hierarchy or in the administrative reorganization that results from the initial impact on the hierarchy with the rise of autonomies (Serrano, 1987). In addition, new tendencies in the processes associated with the transition, such as suburbanization, de-urbanization, and the alteration in the pace of urban growth are studied. In this category, one may also site other authors (Bielza and Escolano, 1987), as well as one work which synthesizes material on the Spanish urban network (Precedo, 1988).

C) As one would expect, research on provincial and regional urban networks is more abundant. The first works to be produced are those on Galicia (Precedo, 1974), and Navarre (Precedo, 1976). Leon (López Trigal, 1979), Catalunya (Casassas, 1981), Galicia (Precedo et alia 1981), the Basque Country (Juaristi, 1985), Aragon (Bielza, 1981 and 1982), Huesca (Callizo, 1988) followed.

D) Understandably, the extensive amount of research in Spain in the area of urban systems and the dissemination of theories gave way to publications that made purely theoretical contributions although theory was usually already included in the empirical studies. One work specifically stands out because it collects the main theories on spatial analysis and urban systems from this period (Murcia, 1979). It is one of the most significant theoretical contributions to Spanish Geography. There is a recent study on the competition between cities that restates the basic theories on spatial growth, but also adapts them to the changes caused by new technologies and models of regional development (Precedo, 1990).

E) As a result of the demographic, economic, social, political, and cultural processes that characterize our new world society, currently, the tendency to establish tangential analysis or prospectives on the dynamics of urban systems is growing.

In this way, studies on urban systems, which began as partial analysis, have become a theoretical support system. With its growing global perspective, this field is of great interest for the understanding of our fundamentally urban society and economy. On the other hand, the assimilation of urban systems in regional politics offers interesting possibilities for regional planning and for the organization of territory.

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8. INDUSTRIAL GEOGRAPHY

8.1. INDUSTRIAL GEOGRAPHY STUDIES IN SPAIN: RECENT DEVELOPMENT AND MAIN RESEARCH LINES

F. MANERO

In the renewal process of geographical research in Spain, it is not gratuitous to see Industrial Geography as a scientific field with the most significant evolution either from the quantitative or from the qualitative point of view. It is, however, a recent expansion in parallel to the metamorphosis suffered by the Spanish Geography since the '70s and to the geographers' openness towards analysing and understanding industrial change. Geographers could not remain indifferent towards said change, specially when its clear mark can be seen on Spanish industrial spaces, and it is a process closely related to the processes prevailing in the E.C.

Thus, research has diversified in our country; geographers, besides following traditional scientific lines, have added new working lines or are adjusting others to modern conceptualization and methodology. These new lines allow more strict and appropriate analysis approaches to understand a complex and changing reality.

A PROGRESSIVE RENEWAL OF PURPOSES AND METHODS

When analyzing the scope of main research lines in Industrial Geography in Spain, we have to refer to their theoretical-methodological development in time. It is said that the turning point was the IV Coloquio de Geografía, hold in Oviedo in October 1975. Till then, the most relevant contributions leant towards sectorial studies; these studies were so numerous that other more geographical perspectives were totally darkened. There is a number of relevant works that have focused on analyzing features of key areas in the production system: either the mineral-energetic fields or manufacturing activities linked to basic sectors (siderurgy, shipbuilding, railroad material, etc.). According to the French tradition in these matters, research and its methodology follow simple schemes in order to actualize their problems and its possible perspectives in the short and medium run.

From the second half of the '70s, Industrial Geography in Spain presents a new dimension due to the important quantitative and methodological jump taken by the Spanish Geography. Although there are valid antecedents, studies from now on will have a spatial approach. Industry is considered as an agent and a reference fact needed to evaluate land dynamics, related to population movements, to changes in employment structure, to location strategies for enterprises or to contrasts in space.

Under such premises, and pointing out in each case the most determinant variables, the literature expands greatly in two scales: local and regional, which

turned out to be the most used analysis. However, local studies will have an exceptional character and will be substituted by titles referring to singular settings or to significant urban-industrial nuclei. The most important contributions are in regional studies thanks to the possibilities opened by the State's autonomous division, which promotes an easy access to statistical information. Traditionally lack of said information diffculted global research on Industry's economic-spatial behaviour in Spain. Therefore, nowadays there is a wide and interesting collection of studies on industrial dynamics within Spain's Autonomous Communities; all of them are contributions that analyze their different development levels and their influences on space.

Although national studies are few, the variety of approaches does not prevent arriving to a global idea of Spain's industrial reality, since the studies present homogeneous methods and perspectives in their analysis criteria and approaches. Though research is, often, conditioned by the sources' quality or by each concrete scenario, it is possible to find a similar methodology: a certain tendency to stress historic foundations of processes, and to study industry within an integral view of all demographic, economic, decision taking and spatial events induced direct or indirectly by it.

THE OPENING TOWARDS INDUSTRIAL CHANGE-INDUCED RESEARCH LINES

Regional analysis is the main contribution in the field of Spanish Industrial Geography; however, we can not ignore the new orientations appearing in our research field at the end of the '80s. Although regional studies do offer a frame of excellent and known results, industrial papers from a geographical point of view on increasingly useful and appealing subjects are not trivial. Among them we include relevant papers that study spatial consequences of crisis and adoption of new growth strategies, due to the industrial change's guidelines. Although these papers follow recent working lines and are just a few, they deal accurately with significant phenomena for our time and territory as re-industrialization policies, the new guidelines for industry location in urban spaces, the meaning of technological innovations in sectorial and spatial re-adaptation, or the role played by local initiative in promoting economic activities in rural areas.

Therefore, the different economic-spatial activities present in Spanish industrial dynamics are better understood. Geographers are studying industrial main tendencies, although there are some lacks in the theoretical-methodological field, in assessing environmental impacts, or in land analysing the companies strategies or public decisions.

In any case, though empirical analysis dominates, we can say that the balance sheet is satisfactory and positive, specially if we take into account the low starting point and Geography's tradition. It must be considered as a solid launching pad for Industrial Geography's development in Spain. Development that must be connected to the ripening of existing research lines, to the opening of new ones, capable of filling the blanks found in the treatment of basic subjects. Moreover, said development is associated to the acknowledgment of Industrial Geography as a specific subject in University Curricula and its leaving the equivocal position within the mixture of contents that conforms Economic Geography.

8.2. INDUSTRIAL GEOGRAPHY AND REVIVAL OF INDUSTRY AND TERRITORY STUDIES

BY R. MÉNDEZ

Since 1986, studies on industry-territory interrelations in Spain are promoted with the creation of a Working Group, nowadays incorporated in the Asociación de Geógrafos Españoles. The Group appeared thanks to the meeting in our country (Chinchón, August 1986) of the U.G.I.'S «Commission on Industrial Change». At first, it was coordinated by Dr. Bosque Maurel, and its activity has two different and complementary effects on Spanish Industrial Geography.

The first has been to multiply some no-traditional studies in our geographic literature. At the Group's first meeting (Madrid, June 1987) Caravaca referred to the few articles on this subject published in Geographical journals: just 39 from 1940 to 1980 (7 % of Human Geography articles). However, the situation has changed since then; taking into account the papers included in the Proceedings of the three Coloquies hold till now (Madrid, 1987; Santiago de Compostela, 1988; Sevilla, 1990), plus the articles appearing in a collective book on «Reestructuración industrial en los espacios urbanos» (1991), they are more than one hundred, besides the articles to be presented at the IV Colloquy, to be hold in Salamanca in June 92.

The second effect has been to re-direct geographers to a new industrial subject; they have tried to integrate their studies with those of other countries and other social sciences, although keeping their own interest on territorial aspects.

From the beginning, it was clear the need to focus on questions linking theory with a certain social relevance, to study industrial problems with a certain actuality. These general purposes have turned into a basic research line: land and socio-economic effects derived from the production re-structuring of recent years, as well as their influence on promotion and planning policies. The Group's publications include aspects of the three elements that conform industrial change:

- Re-structuring processes and their consequences on land
- Evolution of various industrial spaces
- Industrial policy/land policy: present trends and compatibility problems.

a) Spatial consequences of industrial re-structuring processes.

Ford's production model progressive depletion has motivated several managerial answers in order to obtain competitive advantages and to recover profit rates. One of them has been to increase the study of *technological innovations*, applied either to improve managerial processes and organization, or to present new products or to renew present products. L. Sanz, a sociologist at the Universidad Complutense, presented at the III Reunión, a report on recent evolution in the E.E.C. and stressed the technological «gap» among those nations. The other 16 papers presented were on:

- Land distribution of R+D investment, its serious inequalities and innovation incidence according to sectors, enterprises and Autonomic Communities.

– Technological policy applied by the central administration and regional governments, assessing the results according to areas and coordination problems.

The growth of certain peripheric spaces (peri-urban fringes, small towns and rural areas, backwards regions, etc.) is the second process that in the last years is changing industrial maps at various scales. It is related, in some cases, to present trends towards production de-centralization within the big enterprises and in the industrial system, trends that former diffusion processes reinforce. In other cases, it implies taking advantage of local human, natural or capital resources. J.-P. Houssel, of the Univ. de Lyon II, presented at the III Reunión a report on *peripheral industrialization processes* and stressed its relevance in countries of late industrialization. The 25 papers carried out case-analysis either in urban-metropolitan peripheries or in rural or regional areas. They presented some examples of local development, both Administration promoted or spontaneously grown.

The IV Reunión studied present influence of trans-nationalization on industrial structures and spaces. J. Ferrão, of Lisbon's Instituto de Ciencias Sociales, presented a report on the Portuguese case; in next years, comparative studies in Spain are to be carried out.

b) Industrial change in rural and urban spaces.

The Group has also analyzed present industrial trends in concrete spaces. At the II Reunión, J. Ortega, of the Univer. de Cantabria, presented a report on *industrialization processes in rural areas*. He analyzed present industrial function of said spaces, as well as the type of enterprises that get there and their links/conflicts with other activities. The other 23 papers dealt on the role of small industry in rural development, or on Dependence on City and Big Enterprise. Most papers carried out case analysis at a local scale.

The collective book on *industrial re-structuring in urban spaces*, for the first time, attempted the comparison of recent industrial evolution in several metropolitan areas (Madrid, Bilbao, Valencia, Sevilla) and medium-sized towns (Valladolid, Salamanca, Huelva, Logroño), in relation to their productive structure and previous territory. The three first chapters are empirical studies of de-industrialization ideas or the effect of the recovery since 1985; they also dealt theoretically with some industrial changes within the city (withdrawal from Central Areas, managerial tertiaritation) and the new problems in urban planning.

c) Industrial policy versus land policy.

Lastly, besides studying processes and spaces there were also papers on the role played by public policies. They carried out a critical review of their features and effects on land and industry. F. López Groh, an architect, presented at the II Reunión a report on *promotion of industrial land*. He stressed the need to redirect public promotion due to present changes in managerial demand. The following 15 papers studied concrete examples; they assessed the meaning of land offer in industrial promotion/planning and some defects found. The IV Reunión had as central report *national, regional and local industrial promotion policies*. Its reporter was J. del Castillo, an economist at the Univ. del País Vasco.

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8.3. ENERGY SOURCES AND MINERAL RAW MATERIALS IN SPAIN

M. MOLINA

Within Spanish Geography's scientific production and research, the analysis of energy sources and mineral raw materials is not relevant. A first reflection would consider that our Country does not feature said natural resources, our general lack and, therefore, our foreign dependence. Secondly, although these two elements are basic for developing industrial economy, they do not promote spatial development.

The concept of «resource» has changed in relation to the development and transformation of a space, and that change has resulted in the relevance loss of these two resources. In fact, in the first industrial generation and even in the second, these resources determined industrial location in many European spaces. Later on, the energy revolution introduced new cycles, defined by new technological products, and helped to spatially dissociate productive centers from consumption centers. Then, due to the increasing strength of the spatial economic concentration model, new facts have appeared and are studied in those papers on industrial location theories and models. These natural resources, therefore, are not relevant in the spatial theory as developing factors. Though they should be studied by the geographic community, other areas of attention

have appeared due to the fast process of economic transformation that have given place to important socio-spatial changes in Spain. This is the case of urban, industrial and rural studies.

The scientific interest for a geographic study of energy sources and mineral raw materials is in several aspects: first, their scarcity and, in occasions, difficult exploitation raise the price of the final product; second, the producer space has not changed socio-economically in optimum profitable exploitations (they do not act as developing factors although they do generate significant obligations). There are some works that have studied our foreign dependence and resulting prices and supplies fluctuations, as well as their direct influence on the economy. They are by Reyes Bonacasa, Chicharro Fernández and Molina Ibáñez. Closely related to the lack or unprofitable exploitation appears the need to close or decrease the production in some exploitations, with the resulting sectorial re-conversion and serious social problems.

In relation to their influence on spatial development, I find it to be an important analysis element since it can be related to the spatial theory. This aspect has been studied in the first place by Miralbés Bedera, and by Molina Ibáñez in some papers on electrical production.

Besides these two working lines, energy sources and mineral raw materials have been analyzed from different points of view, either in regional or economic studies or by themselves. We have to mention as important early works those by Cabo Alonso, Llobet, Mensua Fernández and Bosque Maurel (end of the '50s and beginning of the '60s). These works broke away from the traditional description and presented an economic and spatial approach. In a similar line, although with a teaching approach, is the work by Burillo González & Sanz García (1961). Moreover, all Regional Master and Doctoral Thesis on areas with a mining-energetic production studied it within the socio-economic and spatial structure; recent regional monographies and general Geography of Spain works follow the same approach.

Lastly, there are also Master and Doctoral Thesis (some of them un-published) on specific energy sources and mineral raw materials, where the authors have analyzed the general aspects of natural conditions, production and consumption. We can mention, among others, the works by Rodríguez García (on León's coal fields), Martínez Cordón (on oil in Spain), and Molina Ibáñez (on Aragón's electrical energy).

Although it is an important research line, its practioners are mainly Chemists, Physicists, Engineers and Economists, with very few Geographers. Technological studies on usage and transformation of these resources have proliferated as well as those on production, consumption and general economic consequences. Many of these works present a geographic approach, as is the case of Muñoz Domínguez, López Mateos, Iranzo Martín, García Alonso or Carles Sudría. These resources have been also studied in the different economic structures of Spain, the most important is the book by Ramón Tamames. These researchers and some geographers have collaborated both in papers, courses, meetings or symposiums. The scientific production, though there is not plenty if compared to other research lines, is well connected and thought in other scientific areas to which it supplements.

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9. GEOGRAPHY OF SERVICES

9.1. EQUIPMENT

L. LÓPEZ-TRIGAL

Spanish geographers have not analyzed enough Daniels' «quinary sector», referring to educative, government and health facilities, in comparison with other tertiary activities. Even other equipment, such as cultural, sport and social, has not even been studied. However, the geography of public services ought to have been stressed, since the process of tertiarisation and the higher living level of present Spanish society has meant a growth in equipment.

Any way, though there has been a smaller contribution to this research line, some geographers have shown their interest publishing and preparing doctoral thesis as well as participating in urban and regional planning studies, where equipment is also analyzed. Nowadays there are doctoral thesis in the making while some regional works are studying equipment; it is likely that next years will see a wider contribution to this working line.

Educative Services. The earliest attention has been paid to the University and its regional area of attraction as well as to its effect on the town where it is. There are studies on Salamanca (García Zarza, 1986), Oviedo (Suarez & Quiros, 1977), Barcelona (Tatjer, 1970, equipo urbano, 1971) or Alicante (Juarez, Ponce & Vera, 1987), from different approaches such as student body potential, staff, the University's urban function and its meaning in each case, or student-generated flows.

A major relevance presents certain research lines followed by some University Departments. The first of these lines began with the doctoral thesis on teaching function in Madrid (Olivera, 1978), directed by Professor Manuel de Terán at the Universidad Complutense. The same author continued that line (1979, 1981, 1989) studying educative facilities' quantitative shortcomings in the city and in the Community due mainly to the removal, for reasons of land revaluation or speculation, of private schools («School District Unendowment») from the city center to the periphery, while the former space has new usages as banks, offices, houses, shops or parkings. Olivera (1990) has analyzed also unequal distribution of schooling and human resources on Spanish provinces, using indexes such as study levels and schooling rates. Her last works present problems in student performance in some Autonomous Communities (Murcia, per instance).

Moreno (1988) presents a quantitative methodological analysis applied to planning of basic educative services in a rural area of Madrid's Mountain; there are problems in accessibility, in optimum location and in service supplying decision-making assessment process. There is a study on Galicia (Torres, 1989) about the provision of public educative services and the distribution of educative infrastructures in a marginal low-density rural area; most problems appear in transportation, economic costs and student removal from their residence due to the

compulsory school concentration in main population centers, so proper of a scattered population model.

City- and province-scale global studies of educative services are made about Alicante (Bartolome, 1989, 1990) and are followed in other doctoral thesis being made about, per instance, León. They analyze the evolution, the relationship between demographic and school potentials, the school endowment according to different territorial structures (rural, urban, or of mining, turistic or peri-urban areas). At the scale of Autonomous Community, there is a global study on Andalucía (Ventura, 1990).

Administration facilities. They have been studied from two different approaches: a) present administrative organization of the new Spanish State, the Autonomous Communities, in relation to: processes of regionalization and countification, problems of land bordering, municipalities size, or to some concrete administrative services (among others, Bielza, 1976; López Trigal, 1981, 1989; Navarro Luna, 1988). b) Administration-generated activity and employment, studying its location and present growth (Gamir, 1988; García Ballesteros & Gamir, 1989).

Health facilities. Studies do not follow a research line. They analyze the distribution of medical-pharmaceutical endowments (Boldu, 1975) or hospitals (Serrano, 1987), or the influence of hospital facilities over an area or city (EQUIPO URBANO, 1971). There are theoretical studies (Olivera, 1986); and teams of geographers and Medicine specialists are publishing epidemiological studies. On Andalucía there is a study on the areas of hospital influence (López Lara, 1990).

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9.2. GEOGRAPHY OF TRADE

V. BIELZA DE ORY

A socio-territorial subject, such as Geography of Trade, depends basically on two time-changing variables: reality, object of study (in our case, trade), and the paradigm or scientific concepts. In an early-industrialized country, reality moves before paradigm, and helps to re-model it in its evolution. Backward Spain, instead, could dispose of the new paradigms that came from abroad when its trade reality was still moving towards new forms; however, epistemological innovations were not used from the first moment.

Until the end of the '70s, when Spain finally entered in an urban-industrial society, Spanish geography followed traditional possibilist concepts and inductive methods. Spanish trade was studied geographically within regional/county docto-

ral thesis, in accordance to Vidal's line (the starting work was by Floristan, 1951), as a chapter on the county. A concrete analysis of trade appeared in the Maps on Markets of Aragón, Navarra and Soria, directed by Casas Torres in the '40s (before, Pau Vila et al. studied the markets in Cataluña); the market influence areas on rural environment were determined through selective and not sample surveys (they tried to avoid ininterested answers since the surveys were addressed to local authorities). Trade appeared studied from an urban point of view in the doctoral thesis on Granada (Bosque mentions earlier works) or Zaragoza by Navarro Ferrer, both directed by Casas Torres, or in the works on Madrid by Terán and followers.

Periodic medieval markets still outlive in rural areas of Spain at the beginning of the '70s. Such is the case of Galicia, studied by R. Miralbes & J.M. Casas Torres (1973) under an inductive methodology (started by Casas Torres in the '40s) from a detailed survey addressed «to all rural parishes in Galicia» (p. 178). The authors, however, made a reference to «present models of modern techniques, linked to Quantitative Geography» and quoted Capel's Spanish translation (1971) of Berry, Brian J.L.'s work, whose English original appeared in 1967. Galicia's trade study is still in a regional-rural context in order to «act as a basis, together with other factors, to establish a county division» (p. 178). Although Spain, at that moment, was an industrialized country according to the statistics, and although Anglo-saxon geographers had matured «quantitative» paradigm, this study is not strange at all. Reality in Galicia was (and still is) basically rural, and physical and rural regional studies still prevailed in Spanish Geography. Human non-rural geography was marginal; the most important global contribution by Spanish geographers, a *Geografía de España y Portugal*, directed by M. de Teran (Ed. Montaner & Simon, Barcelona 1958-67), presents the sections of Physical and Regional Geography, but lacks the chapter on Human Geography.

At the beginning of the '70s, «regional» doctoral thesis were published where trade had a great relevance. Thus, the introduction to *Tierra Estella, Estudio Geográfico* (1972) announces that «the role played by Estella, and basically its trading function in generating the county will be stressed. Its borders are to be limited taking the market area as the main criterium», though not the only one. J. Estébanez in his thesis «Cuenca, Estudio Geográfico» (1974), after analyzing the physical environment and the population's economic activity, studies trade, the commercial centers and areas which are delimited by surveys (Reilly's law is mentioned, however). Although urban hierarchy bases on Berry's thesis, the attraction areas of central places are delimited through inductive methods. In my study on «Area de Influencia de Calatayud» (1974), the commercial area is delimited combining Reilly's model and surveys; that is, using hypothetic-deductive methods plus traditional inductive methods. We should not forget that in those years, H. Capel wrote his doctoral thesis and published «Estudios sobre el sistema urbano» (1974, Universidad de Barcelona). He comments Anglo-saxon Quantitative Geography, though trade is not refered to.

Around 1975, young geographers have already included quantitative methods while Spanish trade reality (mainly in the urbanized areas of the country, such as Barcelona, Madrid, or the Basque coast) moves towards new forms and locations; however, there are not many publications on trade: the oldest journal, *Estudios Geográficos*, does not publish an article on trade from 1970 to 1979. In a

Geografía de España, directed by Teran & Solé, (first edition 1978), J. Bosque studies «Communications and Trading Services» in Chapter XX. He does not quote an article written by geographers in the bibliography (evidence of the shortage or little diffusion of the few papers). The study starts at the relevance of trade (9.5 % of the active population in 1973) and its structure (a huge atomization, tending to business concentration and to create bigger units: department stores, super-markets, self-service markets); he proceeds to analyze commercial centers and areas making use of works by the Economist Fontana Torrats (et al.): *Atlas Comercial de España* (1963), and *Anuarios del Mercado Español 1965-75*, edited by Banco Español de Crédito. Bosque completes his study analyzing Foreign Trade.

As we pointed out in the introduction to a doctoral thesis (Escolano, 1985), «the revolution that brings new and bigger commercial forms appears when the country achieves a certain level of rents and urbanization ...»/»... it is related, mostly, to the phenomenon of metropolization, characterized by the population's spatial mobility and by the massive occupation of rural space around or in between the big cities. In Spain it is after the developing years (keeping in mind whatever happened before in the old industrialized regions) when the genesis of most peri-urban spaces starts. The deficit of commercial facilities, the availability and low prices of land as well as the easy traffic turn peri-urban areas in the most adequate system for the new trading forms. The first hyper-market established in Spain in 1973; till ten years later, the new trade forms are not studied scientifically in geography. See article by Gómez Mendoza on «Estructuras y estrategias comerciales urbanas en España» (1983). Two years later, in the IX Coloquio of Geography, there is a presentation on «Espacio periurbano y el comercio: el caso de Zaragoza» (Bielza & Escolano, 1985). In the same year, S. Escolano's doctoral thesis on Trade in Aragón is published. Starting with the typologies, the author studies the spatial approaches of goods threshold and reach as well as the functional spatial distribution; Escolano proceeds then to order by rank the commercial centers and to delimit the areas of influence. The thesis combines inductive and hypothetic-deductive methods, and uses computer's techniques. The same author, in 1988 and 1989, studies trade in Spain supported by his regional experience. Later on, there appears a doctoral thesis on trade in Andalucía; it has a clear territorial approach, and ends suggesting commercial areas (Márquez Domínguez, 1990).

Our country lacks a systematic treatment of tertiary sector where, leaving aside transport and communications of axial character, they discriminate the strong points that locate directional activities (administration, finance, companies -trading companies even-) and the services activities, commercial included, that form a point hierarchy with its corresponding areas of influence. It is clear that it is related to the inter-urban system hierarchy, which is not stabilized in Spain after the neo-tertiaritation, but that presents studies much more progressive and deep than in the case of trade.

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9.3 TRANSPORTATION

G. CANO-GARCÍA (COORD.)

We present almost 200 works on transportation published in the last twenty years; it is likely that there will be works unrecorded, mainly regional papers, though we are well informed about Andalucía. The space allowed, however, makes impossible to mention all of them in the text; therefore, we are going to refer to those works published after a work of ours (CANO GARCIA, 1988.I). Remarks refer to the whole series, and to each type of transportation by itself; we present, besides, a general or theoretical approach in the first place.

TABLE I
STRUCTURE AND EVOLUTION OF TRANSPORTATION STUDIES

	1971-75	1976-80	1981-85	1986-90	TOTAL
GENERAL & REGIONAL	3.8	3.4	16.6	8.8	8.5 (16)
LAND PLANNING, TECHNIQUES & OTHERS	7.7	15.9	2.1	21.0	12.7 (24)
SEA	34.8	22.9	22.9	24.5	25.1 (47)
ROAD	11.5	14.0	22.9	22.9	18.6 (35)
AIRWAY	11.5	10.5	10.4	10.5	10.6 (20)
RAILWAY	11.5	10.5	4.2	7.0	8.0 (15)
URBAN & INFLUENC. AREAS	19.2	22.8	20.9	5.3	16.5 (31)
TOTAL	100.0	100.0	100.0	100.0	100.0 (188)

Note: Absolute numbers appear in parenthesis.

Besides the already mentioned article, there is another on present tendencies published in 1982; however, there are few papers on theory, recent applications of methods and techniques (Artigues, 1990, Binimelis, 1989, Córdoba & Anton, 1990, and Martín & Rodríguez, 1990, plus those articles mentioned in 1988), as well as on relations with other sectors (regional development, influence of natural factors, industry, tourism and, since 1984, processes of management decentralization, Giménez & Capdevila, 1990).

The study of all transportation within space is not frequent either; in the mentioned work by Cano there are only three references, to which we now add: Piñeiro, 1987. Regional studies are plenty and tend to increase; until 1984, there were four papers on Canary Islands, Baleares and Madrid, as well as other four on Castilla-León, Aragón, País Valenciano and Madrid (Binimelis, Escalona, Pastor and Sanchis & Vega) appeared in 1985-1989. Moreover, there are several on Andalucía about Territory Planning (Cano et al., 1990).

This approach (Territory Planning) appears clearly in three presentations to the VI Coloquio of Geography in 1979, is a report at the XI Coloquio in 1989 (Cano García), appears in the title of a communication (Brunet) and is the subject of a doctoral thesis (Redondo, 1988). Other subjects treated in relation to T.P. and transportation are: the county scale, legislation, environmental impact and spatial strategies (Requejo, 1986, Iglesias, 1990, Delgado, 1990 and Pérez Eparcia, 1987, respectively).

Together with the group of methods and techniques, this group has grown the most; we could list in it the study of influence areas delimited by the passengers mobility (what we called «Transportation and Space» in our paper of 1988.I), a study that borders other geographical areas. We quoted eight papers from 1973 to 1984, and we have not found any others to include in Geography of Transportation.

Something similar happens to urban traffic, that is integrated more and more in another branch of our discipline. It started in 1966 (López Gómez, A.), from 1971 to 1979 there were four studies; at the VI Coloquio of 1979 there were seven papers, and from that year till 1984, there were six more publications.

Afterwards, there are only two works on Palma de Mallorca and Murcia (Seguí Pons, 1988 and Serrano, 1989).

Ports and sea transportation study accounts for the biggest group (around 1/4 of the production). The papers, at the beginning, generally referred to early-established ports (location, site and traffic); later on, they added functions, typology, facilities, fishing, areas of influence, etc.

The '70s involved a great number of publications; papers followed the tendency to study the Cantabrian coast, although analysis on Eastern coast increased (J. López Gómez), while ports in the Canary Islands were also included. In 1979, researchers wrote about hierarchy and systems theory, the conceptualization of influence areas and about maritime space.

The beginning of the '80s continues analyzing ports: see Martínez Roda's doctoral thesis and other works quoted in Cano's article (1988.I). There are as well studies at a national scale, and in 1989 there appears the work by Aaracil. There are, however, more studies at a regional scale, especially on Andalucía (Barragan, 1986-88), the islands (Pulido, 1983, and Petrus, 1990), and a book on the Basque Country (Ciriquiain, 1986). Since 1989, there are recorded five works on ports in Andalucía and the Canary Islands (Barragan, 1989. II and 1990, García Lorca, 1989, Hernández, 1989, and Delgado, 1989), as well as theoretical studies (Castejón, 1989) and methodological analysis (Barragan, 1989.I).

Research on road traffic has increased progressively, although it is at a standstill in the last decade. They study most frequently buses lines, started at the beginning of the '70s, and apply several techniques and methods (Kansky, Kolars and Malin's models, graphes theory, topology) that recently go towards accessibility: López Lara, 1988, Gutiérrez Puebla, 1989 and Rodríguez Sánchez, 1989. Other features of road collective transportation studied are delimitation of influence areas (several papers by López Lara (1989-90) on Andalucía) and provincial analysis (recently, Fernández Santamaría, 1989).

Graphes theory and factorial analysis are applied to networks in Baleares (Seguí, 1985, Binimelis, 1989, Seguí & Petrus, 1989). Meanwhile, the general road transportation in Andalucía (López Lara, 1988), in the province of Alicante (Vera, 1985 and 89), and in Spain are studied either as a spatial strategy (Pérez Esparcia, 1987), or as goods transportation (Arroyo, 1989, and Torrego, 1990), a recent topic likely due to difficult sources. Little-treated subjects are the highway, environmental relations, sites hierarchy, systemic approaches (Artigues, 1990) and gas stations in Andalucía (Benito & Vega, 1989).

Researchers are not interested much on the railroad; its relative weight decreases among all transportation, although there is a slight recovery in the last years. At the beginning of the '70s, network modelling and simulation gave way to new treatments (industrial repercussions, seasonal migration, regional development, network's conditioning facts, space management, ...), of which urban consequences are noteworthy with recent studies about Madrid, community and city, (Fernández Mayoralas, 1989), Andalucía (López Pérez, 1988) and Spain (López Trigal, 1990).

Air transportation keeps a stable percentage in the last twenty years; until 1984, they had studied Madrid's and Barcelona's airports, the nation airports, air

transportation in the country, relations with the Common Market, etc. Anton recently (1989) has stressed once again on Common Market relations. There are new subjects such as air cargo (Peraleda, 1989), Santiago de Compostela's airport (González Fernández, 1989). However, most bibliography appeared after our mentioned work of 1988. I is on Andalucía (Cano, 1988, and López Pérez, 1985, 1988 and 1989).

TABLE 2
RELATION AUTHORS/WORKS

Works per author	Number of authors		Total works	
	1945-84	1971-90	1945-84	1971-90
1	61	69	61	78
2	20	14	40	32
3	14	7	42	24
4	3	5	12	24
5	1	3	5	15
6	1	0	6	0
7	0	1	0	7
8	0	1	0	8
Total	100	100	166	188

Let's finish with some general remarks. Table 2 shows a lesser specialization in the period 1971-90; there is a higher percentage of authors with more than three titles, but they are just 11. The average in the last twenty years is 1.7 % (188 works and 113 authors), and the specialities are as follows: urban transportation and influence areas (1.8), air, sea and railroad (1.5), general transportation (1.3), road (1.2). This order could be the evidence of several difficulties.

Besides, the most used scale is the local (towns, port, airports, ...) with 31 % of the works and the regional (30 %), far away appear the national (11 %, the same than general papers) and the county (8 %). The province only gets 5 %, and others (E.C., lines, zones, ...) mean 4 %. The main difference in relation to the period 1940-1984 (CANO, 1988) is the noteworthy increase of regional studies.

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Abbreviations in initials:

- C.O.C.I.N.: Cámara Oficial de Comercio, Industria y Navegación
- C.I. y N.: Comercio, Industria y Navegación
- C.S.I.C.: Consejo Superior de Investigaciones Científicas.
- E. G.: Estudios Geográficos
- I.C.E.: Información Comercial Española
- E.U.N.S.A.: Editorial de la Universidad de Navarra
- R.E.A.: Revista de Estudios Andaluces
- R.S.G.: Real Sociedad Geográfica

10. GEOGRAPHY OF TOURISM AND LEISURE

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INTRODUCTION.

The geographical aspects of tourism and leisure were relegated for many years in Spanish Geography to local and regional monographs. In the 1970's, however, they achieved their own importance in research. Just in the 1980's geographical production in this field has so increased that it has required systematization (López Palomeque, 1983) and has given rise to exhaustive critical exegeses (Luis, 1988) and theoretical approaches (Sánchez, 1985). Despite this, geographical research on tourism and leisure has not yet reached similar production levels of other countries, neither does it have its own publishing channels.

A relevant role, in the abovementioned initiative, has been played by the Conferences of the Association of Spanish Geographers that have welcomed and even stimulated work in these subjects. This has resulted in several papers being presented at the meetings held in Barcelona (1983) and Madrid in 1989 (Vera Rebollo, 1990). Other national or regional meetings, as well as those promoted by the International Geographical Union, should also be mentioned. The Iberian Conferences of Geography and the Spanish-French Meetings held between 1980 and 1990 have likewise promoted and established the research of tourism and leisure.

THE TERRITORIAL SPHERES OF TOURISM AND LEISURE IN SPAIN

The coastal areas

The first approaches of Spanish geographers, in the 1970's, to the subject of seaside tourism were through the study of other activities or contexts (specially rural environments), or through regional studies where tourism is an innovative and conflictive element in the organisation of space and social environment. In this sense, tourism is considered as an alternative use of natural resources in contrast to traditional activities (fishing, agriculture, salt marsh exploitation, local crafts). The approach varies, from valuing tourism as a growth factor to the more critical opinions which identify this activity with an undermining of the cultural values of the areas in question (Priestey, 1983).

In the mid 1970's, specific contributions began to appear on the territorial transformations produced by tourism and the configuration process of the new situation imposed on the previous rural space (Gil Crespo, 1973; Arroyo Ilera, 1979; Quereda, 1979). This history and an underlying territorial specialisation in

tourism gave rise, in the 80's, to a definite line of study on the subject of the touristic coastline space, focussing on the analysis of the new territorial and urban reality caused by massive seaside tourism (Valenzuela, 1982 and 1985, Vera Rebollo, 1988a) and its conflicts with the other coastal activities, mainly agricultural (García Manrique, 1982 and 1985-86).

The first monographic studies on seaside areas appeared in the late eighties (Marchena, 1987; Vera, 1987; Penas Murias, 1987; López Olivares, 1988; Picornell, 1989), furthering this study line on tourism and territory and focussing on the competitive aspects in the use of land, specially the conflicts between agriculture and tourism (A.G.E., 1987, especially Salva). At the same time, the concept of tourism was widened to include the problems of territorial development and planning from the perspective of a more rational and balanced use of the territory. These ideas are outlined in the contributions of geographers in the White Papers on tourism of Baleares, Costa del Sol and Costa Blanca.

In the same way, there is rising interest in more specialised approaches related to the environmental impact of touristic development, such as protection of the shoreline or the use of water in relation to tourist consumption (Marchena, 1988b; Vera Rebollo, 1988b). The present image of subject diversification referring to seaside tourism is reflected in the papers presented at the 11th National Conference of Geography, which dealt with subjects such as the logic of land production and occupation, (Oliveras, Penas Murias and Anton Clave, 1989), the restructuring of congested areas, the rational use of territory and environmental impact (Picornell et al., 1989), together with solutions for diversifying the demand (Priestley, 1989).

The rural, natural and mountain areas.

During the 1970's several tourist activities in rural spaces experienced remarkable growth, due to the new preferences in demand, orientated more and more towards an appreciation of everything that is «natural», identified with the image of certain landscapes, and «rural» instead of urban, without forgetting the rising interest in the cultural heritage of the inland areas. Forecast for the 1990's confirm these trends. This new «tourism» signifies important consequences (territorial, economic and social) for the areas involved. Worth emphasizing are the prospects opened up by tourism as an instrument for developing depressed zones.

Spanish geographers have approached the study of tourism in rural spaces from different points of view, on different scales and on unlikely tourist and leisure options. All this makes it difficult to clearly define the research referring to rural, natural and mountain spaces. One can say, however, that there are already defined lines of research on subjects such as week-en holiday homes, hunting or ecological tourism. In one way or another, several local studies have already contributed to these and other subjects: Ortega Valcárcel (1973) on the mountains of Burgos, Daumas (1974) on the Pirineo Aragonés, Valenzuela (1977) on the Sierra de Guadarrama, Salvá (1978) on Mallorca Island, or Arque, García y Mateu (1982) on the Pirineo Catalán. In all of them, careful consideration is given to the transformations in the traditional structures caused by the introduction of tourism and leisure activities.

There have been more specialised contributions referring to different territorial areas. This is the case of López Palomeque's PhD dissertation (1982) on the production of leisure spaces in Cataluña and the Valle de Arán. One of the most recurrent subjects referring to rural and mountain environment has been that of the second homes. This has been considered on a general level (Chuvieco and Alcolea, 1983) or in mountain areas such as Gredos (del Canto, 1982), generally related to the Madrid demand. Specialised studies also reflect the increasing attention to hunting tourism, with privileged natural conditions in extensive areas of Montes de Toledo (Martínez Garrido, 1984), Cáceres (Alvarado, 1984), Mallorca (Brunet, 1980) or Córdoba's Sierra Morena sector (Valle Buenestado, 1977). A large number of the contributions to this field have been made or directed by López Ontiveros (1981, 1987), among others. Spa tourism is an incipient activity, although a thriving one within the country, and has been considered in research on cases from very varied regions such as Cantabria, Murcia, País Valenciano, etc. (Gil Luis and San Pedro, 1989; Obiols, 1988). The spa report, after a long period of decay (Miranda, 1984), are entering into a relatively prosperous age (Lisson and Lillo, 1984).

Unequal attention has been paid to other tourist activities. Ski reports, with their controversial changes to mountain areas, have been considered in studies referring to Sierra Nevada (Ariza, 1984), Cordillera Central (Torrego, 1984; Valenzuela, 1987), Sistema Ibérico (Arnaez, 1981) or to the Pirineos, where «white tourism» has been included in general studies. As far as tourism in a natural environment is concerned, this is a developing phenomenon, but not without its conflictive aspects (Valenzuela, 1984). In the 8th Conference of Spanish Geographers in Barcelona (1983) the relationship between nature and tourism was considered monographically (A.G.E., 1984, especially Ruíz Urrestarazu). Certain studies, in recent years, have focussed on agrotourism, a still relatively unknown option in Spain (Fournneau & Martín, 1984; Mulero, 1989).

The urban areas and the rural-urban fringe

The first references to urban leisure and tourism can be tracked down to the classical urban monographs. This is understandable if we consider their functional slant with its subsequent effect on economic activities, particularly the hotel business. This is the prevailing approach in the most representative urban dissertation of the 1960's, by Bosque Maurel. Granada, the subject of the thesis, was then already very popular with tourists and their geographical origin and temporal distribution are given special importance in the study (1962, pp. 167-78). On the level of urban systems it is worth citing the influence of its own regional and Madrid summer holiday-makers on the seaside urban system of Asturias (Murcia, 1981, p. 148-158) or the leisure activities in Huesca province, within the context of its urban network (Callizo, 1988, p. 254-256).

A qualitative improvement in the functional analysis of urban tourism appeared in the monography on the hotel business in Madrid by S. Gutierrez Ronco (1984). This study analyses the intensity and precedence of the tourist flow and the hotel supply in the period 1900-1980. The relationship between the hotel business and the Madrid urban network is also of interest to the author. An attempt at a global relationship between tourism and urban reality in all aspects has only achieved partial results (Escalona, 1981).

Urban materialisation of leisure and recreation practices has been more cultivated. Particular attention has been paid to public space as a centre for free time social activities (Muga, 1980; Bernad *et al.* 1983). Likewise, the flow generated by towns, as «source areas» of recreation demands, is also mainly channeled towards the rural-urban fringe. A local tourism since the 1960's has created an authentic recreative «hinterland» around Spanish towns (Valenzuela, 1989 b; González Urruela, 1985, pp 425-460). Its territorial projection may reach even regional dimensions (Valenzuela, 1976) with the well-known territorial and environmental effect. Preferential attention within this subject has been paid to the second homes in periurban areas, giving rise to several contributions with reference to the whole country (Ortega, 1975; del Canto, 1983; Valenzuela, 1988) and to particular towns such as Madrid (Valenzuela, 1975; del Canto, 1981), Valencia (Miranda, 1985), Sevilla (Fourneau, 1984) or Valladolid (González Urruela, 1985).

Wooded areas in periurban space appear as the destination of a massive and faithful urban demand for the development of passive leisure activities. The two most serious dangers are the elitist privatisation and the damage of the forestal mass (Gil and Gómez, 1983). Active leisure activities (nautical sports, fishing, etc.) take place both on the coast (Martín Ruiz, 1987) and inland (Valenzuela, 1989). The existence of environmental opportunities for the practice of special and elitist sports, such as golfing, hunting or skiing, contributes to shape, in some way, periurban spaces devoted to recreation. An example is the relationship between Madrid and its close range of mountains of Sierra de Guadarrama (Valenzuela 1977 & 1986; Torrego, 1984).

TOURISM AND REGIONAL DEVELOPMENT

The incipient character of the regional approaches to tourism is understandable considering the still insufficient interest that tourism generates among Spanish geographers (despite Spain being one of the leading tourist areas). The unequal development of tourism in the Spanish regions organized as Autonomous Communities is another factor. This situation has begun to change with the introduction of an advanced and complex specialisation of tourism as a regional economic alternative (Vera & Marchena, 1990). The approach to tourism and leisure from a regional perspective by Spanish geographers is threefold:

a.- A general vision of tourist activity in Spain which is compatible with its regionalisation in Autonomous Communities and in large tourist areas of the Iberian Peninsula and its islands. Within this approach there have been publications on the social, territorial and economic aspects of tourism, in the form of monographs or as a part of handbooks of Spanish Geography. The regional analysis of the basic variables in supply and demand has been handled in the studies of López Palomeque (1988), Miranda (1989) or Serrano (1984). In a proposed plan, the diagnosis of regional politics and territorial planning concerning tourism has been taken into consideration (Marchena, 1989).

b.- The introduction of the Autonomous Communities and their subsequent reinforcement in the interest for individual regions is promoting reflexion on tourism in the different regions. The importance of tourism in the regional structure normally determines its importance within the analysis, habitually

concerned with the identification and appraisal of the tourist impact and its effect on regional development (López Palomeque, 1983; Marchena, 1988b; Vera Galvan, 1988) or its impact on regional politics (Marchena, 1990).

c.- A perspective that approaches the incidence of tourism in the configuration and structure of a certain region. We find it in researchs such as the published doctoral thesis (Marchena, 1987) or in the unpublished ones (Vera Galvan, 1989; Picornell, 1989). It also appears in certain specific studies on regional tourist resources (Marchena, 1986), spatial changes (Salva, 1985), territorial strategies (Marchena, 1988c), spatial responsibilities between agriculture and tourism (Salva, 1987) or the analysis of comparative regional touristic scenarios (VV.AA., 1991). The regional or subregional research the so-called «specific tourism» (sports, hunting, spas, etc...) must be included, in which the difficult connection between tourism and territory is detected (Vera Rebollo, 1989).

CONCLUSIONS

The following conclusions can be drawn from the scientific studies of Spanish geographers on tourism and leisure:

- a.- A growing interest (both institutionally and on a personal level) since the 1970's, although still far removed from that of other countries.
- b.- The resulting scientific production, in the case of tourism, is divided between monographs referring to specialised areas and contributions to sectorial subjects.
- c.- Studies on leisure basically deal with urban areas and rural-urban fringe.
- d.- The final acceptance of tourism and leisure as a major subject of research for Spanish geographers would require its full incorporation in the university curricula and a specialised journal as channel for publication.

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11. THE REGION AND THE ARTICULATIONH OF SPACE

11.1. A GENERAL SURVEY

M. SÁENZ-LORITE

The development of Spanish geography -centred mainly on the University where in the 1960s a major expansion was to take place as a result of a spectacular rise in the number of lecturers and researchers- has been greatly influenced by French geography, although in the years prior to the Second World War the influence of German geography was to replace this for a time.

Consequently, it is of little surprise that the work undertaken in Spanish geography, until a relatively recent date, has been most notable for the number of regional studies, or more specifically studies of the «comarcas» (a subdivision of the provinces). Such studies have characterised the majority of undergraduate dissertations and doctoral theses undertaken by Spanish geographers. In parallel with the aims of French geography, an attempt was also made to establish a broad foundation of regional studies, based on which a synthesis could then be prepared, however, this had to be done before an adequate coverage of the Spanish territory had been achieved (Ortega, 1987).

The influence of French geography can also be seen in the content of this research. Initially priority was given to studies of those regions with a distinct and unique character (be it real or imaginary), but with time research began to focus on specific features (agriculture, population...) within the framework of the regions or «comarcas». In these studies the obsession with spatial delimitation and the region's unique character became of secondary importance.

The small amount of theoretical attention given to the regional concept by Spanish geographers is conspicuous. This neglect of a theoretical approach to the regional concept was covered up by a copying of French research methods with the result that most regional theses consisted of a series of chapters of general geography describing the «comarcas».

In practice, the number of theoretical studies based on the region are scarce (Dantin, 1922). It has only been in recent years -coinciding with the increasing influence of other approaches and geographic schools within Spanish geography- that such theoretical studies have been provided, or more accurately that theoretical and methodological reflection has been initiated on the concept of the region.

However, in many cases, this concern has not been manifested in specific contributions to the debate itself, but rather has appeared in recently published works of a general nature which examine the evolution of geography (Capel, 1981; Estébanez, 1982; Gómez, Muñoz and Ortega, 1982; Vila, 1983). Thus, one of the Spanish geographers who has done most to stimulate this debate was able to write as late as 1984, that « there appears to be a certain lack of interest for

the stricta theoretical aspects and a greater emphasis placed on the history of Spanish geography» (Capel, 1984).

When we talk about the neglect shown towards this debate this does not mean that there was a total absence of concern. Although few in number, certain studies which have dealt with the region should be mentioned. Solé Sabaris (1975) has written an excellent study of the regional concept and its evolution. An analysis of the Spanish bibliography used by Solé Sabaris is indicative of the lack of theoretical studies made by Spanish geographers in those years in which the region was seen as the only true object of geographic study.

From the middle of the 70s a certain change in attitude was experienced. In the «V Coloquio de Geografía», held in Granada in 1977, a round table discussion, headed by Vila, was dedicated to conceptual and methodological problems in Regional Geography. Two years later, in 1979, the «Asociación de Geógrafos Españoles (A.G.E. 1980) organized a series of seminars entitled «La Región y la Geografía Española», which were attended by a good cross-section of Spanish geographers. In the prologue to the proceedings, it was written «this book shows that Spanish geographers have been infected by the virus of geographical theory; and in an entirely acceptable way.... By contributing to a theoretical understanding of the region the gulf may be filled.»

It is significant, -in order to gain an understanding of the evolution and situation of Spanish geography- that a period of 50 years had had to pass between these seminars and the publication of «La Cerdanya» (Vila; 1926).

Consequently, we can now claim that in recent years a change has been initiated in the attitude of Spanish geographers as regards the need for and an interest in theoretical studies of the region and Regional Geography. The pioneering work undertaken in this respect by the University of Barcelona should be recognised. Undoubtedly, this new attitude has been aided greatly by the development of the so-called regional economy and the strengthening of its ties with our discipline (Lozano, 1979; Bosque, 1986), as indicated by the increasing presence and participation of geographers in the meetings of the «Asociación Española de Ciencia Regional».

More recently, and coinciding with an increase in the influences on Spanish geography -indicative of the plurality of the present-day discipline- making it more open to heterodox thinking and approaches, Spain has experienced a rebirth of regional studies which this time is accompanied by a theoretical debate on the regional concept (Boletín A.G.E., 1985).

According to a number of Spanish geographers, this reintroduction of the region and regional studies, will be one of the major features of Spanish geography at the end of this century, independent of the methodological focus (Nogué, 1990).

However, while recognising the renewal of regional studies -as well as the concern for the theoretical debate, interest needs to be directed to the recent territorial organization of the Spanish state as an Autonomous State, according to the 1978 Constitution- it is important not to forget the gaps that remain in the concept if we are to advance as far in the field of methodology as in an understanding of the characteristics that should define the region (Méndez and Molinero, 1991).

In short, the reappraisal of the region and regional studies, together with the recent concern shown by Spanish geographers for theoretical and methodological research, allows us to view future developments with a certain optimism.

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11.2. STUDIES IN TERRITORIAL ORGANIZATION: THE CASE STUDY OF CATALONIA

LL. CASASSAS (†)

HISTORICAL BACKGROUND

The study of the internal structure of Catalonia has been a traditional concern within Catalan geography. The following represent studies which have most influenced present-day thinking. Those works which were published at the start of the 17th century and therefore of a more intangible influence are not included; the focus is rather on those of more immediate influence.

a) «Determinació de les comarques naturals i històriques de Catalunya» (1897) by the naturalist, geologist and speleologist Norbert Font i Sague, which examined the smaller territorial units and represented them successfully in map form.

b) Studies undertaken in the first quarter of the 20th century by the «Mancomunitat de Catalunya» -the first regional government of the 20th century with certain administrative autonomy- into the drainage and improvement of marshland, the establishment of a telephone network, a general plan for roads and highways, the siting of public libraries, the creation of a Garden City, etc.

c) Conference given by Pau Vila (December, 1931) in the cycle «El problema comarcal a Catalunya» called «Una solució del problema comarcal: Una divisió de Catalunya en comarques», in which he presented a map of the «comarcas» and new criteria for regional analysis.

d) Studies undertaken by the Catalan government, the «Generalitat» -the new autonomous government in the Republic. Most importantly:

(i) «El pla de distribució en zones del territori català. Regional Planning» carried out by the brothers Nicolau and Santiago Rubió Tudurí. It proposed a planning system for Catalonia, offering guidance as to the respect to be given to the landscape, incorporating an analysis of economic functions, etc.

A continuation of this study was made in the project presented during the Civil War, in 1937, at the «Conferència de l'Apròfitament Industrial de les Riqueses Naturals de Catalunya (CAIRN), which made an inventory of energy sources and other natural resources of the region and set up plans for their development.

(ii) The proposal for a «Divisió Territorial de Catalunya» in a report presented in 1931, including significant contributions by geographers such as Pau Vila, Josep Iglésies, Miquel Santaló, etc. The proposal was accompanied by a map dividing Catalonia into 38 small territorial units called «comarques». The division was enacted in August and December, 1936 only to be revoked by the conquering forces of the Civil War who were to reintroduce the provincial division.

(iii) Studies carried out in drawing up the «Plan General de Carreteras» (Roads), which led to the municipalization of Barcelona, etc.

THE IMMEDIATE POSTWAR PERIOD

At the end of the Civil War, studies of territorial organization were curtailed. The most important geographers scattered and theoretical speculation ended. But the complexity of the territorial transformations which were taking place generated studies which attempted to bring order to the territory, mainly in the outskirts of Barcelona, an area which was being overwhelmed by the uninterrupted flow of migrants from different regions of Spain. For this reason the theoretical debate on the territorial concept was renewed.

Logically, each of the plans which were brought into being contained an important theoretical component.

a) «El Plan Comarcal de 1953» which, in fact, was the first metropolitan plan in Spain. It was introduced in 1953 in order to control the municipal territory of Barcelona and 26 municipalities in its area of influence. The plan deemed as necessary the zonification of certain municipal districts and established a complex range of qualifications.

b) «El Plan Provincial de 1959» was an attempt at solving the problem of economic inequality and imbalance present in the province of Barcelona, by improving urban conditions and protecting the artistic heritage and the landscape. It divided the territory into preferential development zones, setting up sectors of intervention which coincided with the «comarcas» of 1936.

c) «El Plan director del área metropolitana de Barcelona» arose out of studies made in 1966 into the insufficient area of the «Comarca» created in 1953. The studies were initiated on the introduction, in 1957, of the Municipal Charter of Barcelona which granted new powers to its City Council. The 500km² of the «Plan Comarcal» were expanded to 3,300km². The theoretical efforts to incorporate prevailing world thinking to the traditional ways of the Catalan school were significant.

d) «La Entidad Municipal Metropolitana de Barcelona» was created by decree of the Spanish government in August, 1974. It was an attempt at creating a more rational territorial organization in the region of Barcelona when, for diverse reasons, the ideas contained within the aforementioned «Plan Director» were abandoned. They returned to the Comarca of 1953 which had already proved to be inappropriate for the reality of the country. Soon after the «Entidad» took on the name «Corporación Metropolitana de Barcelona» which was conserved until its disappearance in 1987 according to «Ley del Parlamento de Cataluña».

THE ARRIVAL OF THE MODERN ERA (1960-1990) A THEORETICAL RENEWAL (1960-1975)

The general stagnation of intellectual life following the creation of a new regime after the Civil War, led to a drought in the field of ideas. In Catalonia, there was a clear consolidation of a certain neopossibilism represented by the groups which grew up around Pierre Deffontaines and of the necessarily suspicious «Societat Catalana de Geografia». They tried to confirm the work of the «Ponencia de la Divisió Territorial», procuring not to lose contact with other geographers in other parts of the state and abroad while keeping faith with the traditional «regional « school.

However, alongside the social and economic transformation new focuses were slowly being introduced. This coincided with the introduction of development areas, of vertical conceptions even in territorial organization, and of technocracy.

It was a time in which territorial analyses started to be undertaken not only by geographers but also by researchers in other disciplines: architects, engineers, economists and computer scientists, lawyers, and autodidacts, etc. This stage began with the appearance of «Geografia de Catalunya» edited by Solé Sabarís and might be said to have ended with the convocation and the studies undertaken by the «Congreso de Cultura Catalana».

Vilà Valentí's study («Introducció a l'estudi de les comarques catalanes en Geografia de Catalunya», vol.II, 1964) and Solé Sabarís's article («Sobre el concepte de regió geogràfica i la seva evolució» in the «Miscel·lània Pau Vila», 1975) represent major works undertaken in this period. In these years important works were also to appear from Enric Lluch, Manuel Ribas Piera, Joan Rebagliato, Josep M. Urgell, Joan Soler Riber, etc. The introduction of new criteria and new methodologies became increasingly more evident, as well as an obvious concern to adapt and incorporate new focuses without precipitating a break with the traditional school.

A TRANSITION IN THE FIELD OF GEOGRAPHY (1975-1987)

The period following the dictatorship also involved territorial transformations which were to be analysed by the diverse group of analysts mentioned earlier. The period was characterized by a greater dynamism and a greater participation on the part of the metropolitan sectors, a greater mobility for reasons of residence-work, leisure, business, school, etc., and the rise in the number of private vehicles, a strengthening of the neighbourhood environment, a greater demand for public participation and control, etc.

At the «Congrés de Cultura Catalana», held in the second half of the 70s, attention was drawn to the impact of these changes on the organization of society and, consequently, on the need to revise the mythical comarcal division of 1936. In this respect the participation of Solé Sabarís and of the architect Cantallops in the work of the conference was particularly significant. The main studies discussed at the conference were later to be published as «La nova divisió territorial de Catalunya» (1983) by the Geography Department at the Universitat Autònoma de Barcelona.

The most innovative of these studies were those undertaken by Joan Rebagliato, Joan Soler Riber and R. Serra, who continued to work within the traditional concepts but now were to offer a thorough analysis of the territory.

The renewal of both the political and intellectual life gave greater importance to urban centres from which a greater efficiency in the provision of services was now demanded. The villages were considered too weak and too small to carry out their duties alone. Meanwhile, the comarcas were begun to be seen as too large in order to be efficient bodies of local administration. The idea of combining municipalities became more widespread and gave rise to interesting theoretical efforts to explain the new situation. One such attempt was Lluís Casassas and Joaquín Clusa's «L'organització territorial de Catalunya» (1981) in which, for

the first time, the traditional concept of the region was abandoned and territorial organization based on the needs of local administration was introduced.

Moreover, everything was to coincide with the changes experienced in the concept of territory and the appearance of new approaches: perception geography, the beginnings of the radical and humanist approaches, etc. This gave rise to the publication of important studies of differing origins and tendencies, for example, those written by Pau Alegre, Joan Alemany, Enric Argullol, Rosa Ascon, Jordi Borja, Joan Busquets, Helena Estalella, Carlos Carreras, J.M. Carreras Puigdengolas, Lluís Casassas, Joaquín Clusa, Manuel Larrosa, Josep Mir, Joan Prats, Manuel Ribas Piera, Albert Serratos, Manuel de Solá-Morales, Marçal Tarragó, Antoni Tulla, José M. Vilaseva, etc., studies carried out by the «Instituto Universitario de Estudios Territoriales», the «Academia de Jurisprudencia y Legislación», the «Centro de Estudios Territoriales», and the studies undertaken in the «Societat Catalana de Geografia» and the contributions made by some city councils- particularly in Barcelona and the «Corporación Metropolitana de Barcelona».

Many of these studies were published in Enric Lluch and Oriol Nel·lo's book «El debat de la Divisió Territorial de Catalunya» (1984) and published by the «Diputació de Barcelona». Its publication marks the end of a period in Catalan territorial thinking.

RECENT STUDIES (1987-1990)

The debate on territorial organization was injected with renewed vigour following the new Spanish democratic constitution's recognition of the possibility of organizing the territory according to supramunicipal units, and the introduction by the «Estatuto de Autonomía de Catalunya» of a comarcal organization and the possibility of a supracomarcal structure.

The debate involved, on the one hand, the insistence of the geographer Lluís Casassas who defended a territorial organization based on municipal units. The other side was represented by the economist Joaquim Clusa, working on similar criteria, in studies of comarcalization in other Spanish regions -Andalusia, the Autonomous Community of Madrid, the Basque Country, etc.- and who gave this approach a considerable following.

However, finally, the theoretical debate was silenced by the proposal of the Catalan regional government to restore the 1936 divisions. The parliamentary debate and the passing of the «Leyes de Organización Territorial» took place at the start of the spring of 1987. The comarcas were reintroduced, the «Corporación Metropolitana» was dissolved, new metropolitan bodies were created (Water and Transport), a new municipal system was set up and a reduction in the powers of the «Diputaciones» was initiated.

These laws introduced a commission for territorial division within the government, whose job it was to bring the laws passed up to date and to propose any modifications they thought fit. Thus, the creation of three new comarcas and the modification of comarcal and municipal boundaries were proposed as well as the need to make certain aggregations and segregations of some comarcas.

With respect to the supracomarcal level, the commission put two of its members, the geographers Lluís Casassas and Joan Vilá, in charge of the presentation of a

project on the division of Catalonia into regions. This study was presented in 1990.

Currently being undertaken are various studies which require further theoretical debate: the drawing up of the commercial map of Catalonia (Cámara de Industria y Comercio de Barcelona), the drafting of a general development plan for Catalonia and the Barcelona area by the Catalan Government, among other studies.

These events have given rise to a theoretical renewal, to the appearance of doctoral theses containing regional theory, to the initiation of wider studies into territorial development both theoretical and applied, and the holding of courses and debates on territorial teaching in the «Sociedad Catalana de Geografía», the «Sociedad Catalana de Ordenación del Territorio», the «Asociación Catalana de Ciencia Regional» and within the heart of the Universities.

12. STUDIES OF THE GEOGRAPHY OF SPAIN AND THE IBERIAN PENINSULA

J. VILÀ-VALENTÍ

In this brief summary we shall review studies which have been made of the geography of Spain and the Iberian Peninsula from the middle of this century to the present day. Four or five very important works- most of them collective- define the period. This fact enables us to review these works in accordance with the evolution of geography in Spain, a subject which began its development in the Spanish universities in the 1940s.

At that time the growth of geography was restricted in its location to a few centres (Madrid, Zaragoza and also Barcelona) and was based on the initiative of a few teachers (Amando Melón and Manuel de Terán, in Madrid; José Manuel Casas Torres, in Zaragoza; Lluís Solé Sabarís and Salvador Llobet, in Barcelona). Undoubtedly, the most notable of these in the 1940s and '50s were, because of their rôle as founders of schools and inspirers of a large number of pupils, Manuel de Terán, at the University of Madrid and the Instituto J.S. Elcano of the Consejo Superior de Investigaciones Científicas (C.S.I.C.) and José Manuel Casas Torres, at the University of Zaragoza and also at the C.S.I.C. Institute in the same city. At this time, Professor Solé Sabarís was director of the Instituto de Geografía J.S. Elcano in Barcelona.

These professors and their pupils were the authors of the major works of the geography of Spain, published from the 1950s to the 1970s. The former constitute what might be called the first generation of geographers, their work maturing appreciably towards the 1950s, while the latter form a distinct second generation. More detailed information, regarding this research and their geographical authors in Spain, as well as their corresponding cultural and scientific contexts, can be found in the book published by this author three years ago (Vilà Valentí 1989).

THE FIRST GENERATION (1946-1955)

As mentioned above, the first generation might be seen as those authors who were educated before the Spanish Civil War (1936-1939) and who came of age in the middle of this century.

The study coordinated by Manuel de Terán, entitled «Geografía de España y Portugal», of the Spanish territory - including the Iberian Peninsula as in the general volumes there are references to the whole peninsula as well as there being a volume dedicated entirely to Portugal -, represents a highly significant contribution. It symbolizes, without any question, the first major step, albeit incomplete, towards a contemporary geographical understanding of the two countries and of the Peninsula as a whole. The initial plan was to publish a study of the physical geography of Spain and another of the human geography, as well

as a study of the regional geography of Spain - which eventually comprised three volumes but which we shall not analyse here - and a final study dedicated to Portugal. With regard to the geography of Spain only the study, divided in two volumes, of the physical geography was published, coordinated by Lluís Solé Sabarís.

The physical study was written entirely by naturalists, clearly demonstrating that research in physical geography still showed signs, at that time, of serious deficiencies. The first volume, dedicated to relief, was written by the geologist and geographer Lluís Solé Sabarís and the geologist Noel Llopis Lladó 1952. It represents an excellent and thoroughly researched study, although at times there is maybe too much geological data. Solé Sabarís is, also, a gifted exponent of pedagogy. Stratigraphic and tectonic studies are well developed. There are good studies of certain petrographic and geomorphologic sectors (karstic, sandstones, etc.) and of various geomorphogenetic systems (pluvio-fluvial, glacial, arid, etc.); however, no direct reference is yet made to the periglacial. Above all several analyses of certain relief forms - e.g. the Meseta, the Pyrenees, the Cordilleras Béticas - provide excellent examples of monographic studies.

In the second volume, a geologist and hydrologist, Valentí Masachs, was responsible for the section related to climate and hydrology, while a botanist, Pius Font i Quer, undertook the study of vegetation (1954). The former made a significant effort in the climatic analysis, a field still lacking in sufficient information and the study is consequently not very elaborate; while, the hydrological study was based on his doctoral thesis, published in 1947. The work of Font i Quer shows a great scientific maturity and the collection of both extraordinary and well-selected data, incorporating several recent methods and concepts (ecological, phytosociological). The book still, however, lacked a coherent study of soils.

FOREIGN CONTRIBUTION

Although here we are mainly concerned with studies made by Spanish geographers, it only seems right to mention several foreign authors. In fact, within this group of geographers there are several teachers and researchers who have shown a great interest in Spanish and Iberian studies. Some of these have been publishing studies of Spain and the Peninsula since the 1960s.

Undoubtedly, the long and arduous work carried out by the German, Hermann Lautensach, who began his travels around Spain in the 1920s, should be highlighted. His most important and comprehensive work was published in 1964, accompanied by a very interesting thematic atlas. His innovative approach together with a rich and varied data enabled him to examine numerous physical and human aspects in great depth. Several of his classifications and conclusions, although at times perhaps somewhat personal, gave rise to fruitful discussions.

Among the French geographers who worked on presentations and analyses of Spain or the Peninsula in its entirety, are Michel Drain and A. Huetz de Lemps whose publications are worthy of mention (Several of these included in bibliography). Ferras also initiated an original contribution to cartography and

today continues in his innovative work at the Maison de la Géographie in Montpellier.

The work carried out by the Portuguese geographer, Orlando Ribeiro, is fundamental for understanding Portugal and the Peninsula as a whole. Here we shall only mention the study of Portugal included in the collection directed by Manuel de Terán (1955). In recent years a new edition of the works of Orlando Ribeiro has been published, with additional material and commentaries; texts by Hermann Lautensach have also been added.

THE SECOND GENERATION (1966-75)

Since the second half of the 1960s, several authors belonging to what might be called the second generation, educated around the 1950s by the aforementioned teachers, undertook the preparation and publication of studies of the geography of Spain. Thus, within this field, the period 1966-75 produced a contribution of great relevance to this present study.

J. Vilà Valentí's study of the Iberian Peninsula, initially published in the «Magellan» collection coordinated by Pierre George, was conceived as an ordered vision of the Peninsula, in accordance with those studies verified up to that time in the different fields of geography, incorporating the innovativeness of recent analyses, both in the various physical and biogeographical areas as in the socio-economic (1968).

A collective work in this field, to which ten authors contributed, may be seen as being characteristic of this second generation. The coordination of the publication was in the hands of two of the geographers from the first generation (Ll. Solé Sabarís and Manuel de Terán) and it is clear that the majority of the authors received their training in those two or three centres which were active in Spain in the 1950s: A. López Gómez and Angel Cabo in Madrid; J. Bosque Maurel in Zaragoza; J. Vilà Valentí in Barcelona. The other authors (Maria de Bolós, Horacio Capel, Vicenç Rosselló and Francisco Villegas) were linked directly with the geographers of this second generation (1978).

It should be highlighted that all these geographers were a product of the initial impetus in Spanish geography at the end of the 1940s and at the beginning of the 1950s. Only Ll. Solé Sabarís was to receive his university training outside of the Arts Faculty, in which geography had become definitively installed. The two thematic interests (physical geography and human geography) of the editors can be clearly traced: the editorial responsibilities being divided according to these, but in addition Ll. Solé Sabarís was directly responsible for relief studies and hydrology, while Manuel de Terán wrote the general introduction to the book and the chapter on industry.

Although it was not to be published until some years later, it should be borne in mind that a large part of the work was prepared at the beginning of the 1970s. The principal aim was to produce «a treatise at a level worthy of the university»; an objective fully vindicated. It was an attempt at a presentation of a study of the geography of Spain within a wide and varied framework, incorporating both physical (relief, climate, hydrology, vegetation) and human aspects (population and settlement patterns, agriculture and stockbreeding, fishing, communications

and commercial services, tourism, socio-economic problems). Also evident, especially in some authors, is the development of a certain personal field of speciality, a fact that is in accordance, in short, with the general evolution of Spanish geography throughout the 1970s.

A second edition was published in 1986, coordinated by Professor Vilà Valentí. This incorporated changes which had occurred in the Spanish population and economy, together with a new chapter on industry, written by Manuel Ferrer, a geographer belonging to the second generation, trained at the University of Zaragoza.

RECENT PUBLICATIONS (1988-1991)

In the second half of the 1980s three works were published of the geography of Spain, each with a different aim, and which clearly indicate the degree of development undergone by geography in Spain in the last quarter of the present century.

Each is a collective work whose authors in the main were trained at the end of the 1960s and the first half of the 1970s. The number of centres training geographers was by then greater: in addition to the three initial centres (Madrid, Zaragoza, Barcelona), in the 1950s new and particularly active groups were founded in Valencia, Granada, Valladolid and Murcia (in this order of chronology). Later this trend was to continue with considerable dynamism. Furthermore, a large number of the authors of these works were to be influenced, in one way or another, by the new trends present in geography in the last two decades and similarly by new methods and techniques - in particular by the so-called theoretical or quantitative geography.

The work coordinated by Rafael Puyol of the Universidad Complutense in Madrid (The collection «Geografía de España»; 1988-1991) undertook a monographic presentation, in 18 small volumes, of the distinctive geographical aspects of Spain. In addition to what might be considered the traditional areas, although at times considered from a new perspective, are analyses of a general nature (the geographical understanding of Spain, the diversity of the natural landscapes), of social characteristics (poverty and inequality, electoral geography), of the new regional divisions and of Spanish entry into the European Community.

Only three of the authors (A. Floristán, J.M. Rubio, J. Vilà Valentí) belong to our so-called second generation. The remaining seventeen authors belong to that group which came of age in the 1980s (L.M. Albentosa, J. Alonso, F. Arroyo, J. Bosque Sendra, J. Córdoba, E. Chicharro, J.R. Díaz, J. Estébanez, J.M. García, R. Méndez, M. Molina, R. Piñeiro, A. Precado, R. Puyol, M. Sáenz, P. Salvà and M. Yetano).

A year after the publication of the first volumes of this collection, the two volumes of «Territorio y Sociedad en España» appeared (1989-1990). The work, written as a university manual of the geography of Spain, was coordinated by Vicente Bielza de Ory, of the University of Zaragoza. With the exception of J.M. Rubio and E. García Manrique, the remaining contributors are geographers trained, in the main, in the 1960s and 1970s (J. Alonso, V. Bielza, F. Díaz, A. Escalona, S. Escolano, A. Gamir, A. García Ballesteros, F. Manero, E. Martínez

de Pisón, M. Molina, M.H. Pascual, J.L. Peña, F. Quirantes, M. Sala, P. Salvà, J. Sancho and M. Valenzuela). As «the multi-disciplinary nature derived from the territory has not been ignored» contributions are made by specialists from related fields, albeit with a somewhat uneven distribution (seven geologists and one economist).

Faced by the complexity of the territory and society the range of research areas is wide. In physical geography, apart from a significant rigour in the treatment of geological aspects, the study of certain edaphic, ecological and environmental issues is new; while in human geography the newest areas of analysis are probably related to administrative activities and external relations.

A third publication of interest in this field consists of the first three volumes of the «Geografía de España» coordinated by Joaquín Bosque Maurel (Universidad Complutense) and Joan Vilà Valentí (University of Barcelona). The work is aimed at a wide yet educated audience, but this does not mean any loss of conceptual or terminological rigour. Particular importance has been placed on the presentation of information in graph form, so that the distinct research areas are fully illustrated, with commentaries specially written by J. Martín Vide. The large majority of the contributors, with the exception of the coordinators, who belong to the so-called second generation, are geographers who have come of age in the 1980s (1989-90). The number of contributors is very high, more than 50 if we take into account the seven volumes of regional studies, representing, thereby, the participation of members from nearly all the university groups of Spanish geographers.

The studies of the geography of Spain appear in the first three volumes. In the first, the introductory texts and physical geography, L.M. Albetosa, María de Bolós, Antonio Gómez, F. López Bermúdez, J. Martínez Gil, Blanca Tello and J. Vilà Valentí have contributed. The study of the different fields is well-balanced and exhaustive, in spite of the diversity of topics covered. These characteristics are also evident in the second and third volumes of the collection - dedicated to human geography.

In these last two volumes J. Bosque Maurel, J. Bosque Sendra, Carles Carreras, Diego Compán, Elena Chicharro, Amparo Ferrer, A. García Ballesteros, Miguel González, Pere López, Ricardo Méndez, Mercedes Molina, Rafael Puyol, Francisco Ortega, Francisco Rodríguez, Manuel Saenz, Eugenio Urdiales and Francisco Villegas have contributed. Although every effort has been made to maintain a balance between the various topics studied, there is originality in both the approach and content. Among these, perhaps the most significant is the study of environmental problems.

SOME FINAL REMARKS

By way of conclusion, it would appear appropriate to highlight that, over the fifty years reviewed here, there has been no shortage of depictions nor analyses of the human and physical geography of Spain by the country's geographers. On the contrary, we could even talk of the maintenance, in spite of certain irregularities, of a line of research in this field, represented by a series of publications which are full of value and significance if they are seen as an expression of a given generation and context, within the evolution of Spanish geography.

The «Geografía de España y Portugal», coordinated by Manuel de Terán, represented a fundamental and decisive contribution by the so-called first generation - especially by Ll. Solé Sabarís - to an understanding of the physical geography of Spain (volumes 1 and 2). It should be remembered that included within this collection, in volume 5, was the geographical study of Portugal by Orlando Ribeiro.

Within the line of research with which we are here concerned, the rôle of the second generation is reflected in the synthesis carried out by J. Vilà Valentí («La Península Ibérica», 1968) and above all in the preparation of the collective work «Geografía General de España», coordinated by two geographers from the previous generation (Manuel de Terán and Ll. Solé Sabarís), and involving the collaboration of eight contributors, each of them geographers and university lecturers. These publications began to reflect the objective changes, both social and economic, which characterized the evolution of the country from the end of the 1950s (the so-called economic stabilization; major migratory movements both internally and abroad; economic growth of certain sectors, with the appearance of marked socio-economic and territorial imbalances).

Spanish geography, in common with very few other countries, is noticeable for the major efforts taken in recent years in carrying out and publishing general geographical studies. These recent analyses have been collective studies whose publication was begun in 1988-89 and finished two or three years later. The studies include the collection «Geografía de España» (coordinated by Rafael Puyol), the two volumes of «Territorio y Sociedad en España» (Vicente Bielza de Ory) and the first three volumes of «Geografía de España» (Joaquín Bosque Maurel and J. Vilà Valentí). Although the three works have set themselves different objectives and their analyses and results are different, it is evident that each of them offers a present-day view of the geography of Spain, moreover largely carried out by the present generation of geographers.

Two conclusions can be drawn. Firstly, these works reflect those significant, even decisive changes which have taken place in Spain in the 1970s and 1980s at many different levels - social, economic, political - and their differing repercussions on the regions and comarcas. Thus it is possible to speak, as in the introduction to one of these works, of the presentation of «a new image of Spain».

Secondly, it is possible to identify innovations. Indeed, in recent decades there have been important shifts in geographical approaches and methods and a considerable increase and diversification in the data used. This is reflected in the presentation and analyses of all fields of study, particularly in the research of certain areas. Moreover, it is clear that, as a result of this, Spanish geographers have begun to investigate specific fields in more depth, giving rise to a considerable rigour in the study of many events and issues. In spite of certain attempts at synthesis, these in-depth analyses clearly dominate the global studies.

Thus, we cannot ignore the efforts made by Spanish geographers, particularly in recent years, in the field studied in this paper, that is global analyses and studies of the geographical characteristics, both physical and human, of Spain. A certain ignorance of these works can be noted among Spanish specialists in subjects closely related to geography, both in the natural sciences as well as in the social sciences. There would also appear to be a considerable ignorance of these

publications among certain foreign geographers and geographical centres. Hence, this review might have a certain informative and orientative value and perhaps serve to bring this work to the attention of the aforementioned groups.

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PART THREE

INTEGRATING APPROACHES
AND NEW PERSPECTIVES IN
SPANISH GEOGRAPHY

1. NEW TECHNIQUES FOR GEOGRAPHIC RESEARCH (GEOGRAPHIC INFORMATION SYSTEMS, AUTOMATIC CARTOGRAPHY AND TELEDETECTION)

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1970-1990 the period under review, has signified important changes in research lines and for applied techniques. Possibly the adoption of techniques or instruments such as geographic information systems, automatic cartography and tele-detection, was one of the major innovations carried out during this period.

The adoption of such new techniques in research, concerning teaching, is a process basically from the decade of the eighties, particularly as far as a better propagation is concerned as well as information technology equipment. In the preceding decade an interest in the new methods had already existed and it was during those years when pioneering applications were made with the functioning of the National Geographic Institute (IGN) standing out among them.

INFORMATION TECHNOLOGY AND GEOGRAPHIC INFORMATION SYSTEMS

During the seventies the beginning of the application of infotech techniques appeared in the Spanish University. These techniques are in general related with quantification in geography. The first projects involving infotech systems were carried out at the National Geographic Institute (IGN).

One could say that the introduction of Geographic Information technology Systems in Spain took place about the middle of the seventies within the National Geographic Institute, under the direction of its, at that time, General Director: Rodolfo Nuñez de las Cuevas. «Starting from 1975, the development of a data base was initiated at the National Geographic Institute, although timidly at the beginning. This process was carried out in two ways. First, monographic data bases were developed comprising a specific subject of the National Geographic Institute. Secondly, the development of a logic instrument (softwear) of a general character was initiated. This allowed the storing, reference, management and conditioned recuperation of information about land both of numerical and graphic types. This general logic instrument was constituted by the logic equipment of the National Geographic Institute Information System (SIGNA), which in its first phase of development was completed in 1979. However, the enormous difficulty of getting hardware to support valid and homogeneous data with reference to land, has forced the National Geographic Institute to concentrate all its efforts,

since 1981, on obtaining a complete loading of monographic data bases» (Màs, 1986).

At the end of the seventies, precisely in December 1979, the Royal Geographic Society, in collaboration with the National Geographic Institute, organized a course called «Quantification Techniques for Geography» given by British teachers, professor Estébanez (who was the coordinator and in charge of the course) and the engineer geographer García-Courel, Director of the Section of Automatic Cartography in the National Geographic Institute. This course had a remarkable influence on all the participants -most of them from Spanish universities- and provided a connection between technicians of the National Geographic Institute and the Complutense University of Madrid Geography teaching staff with an interest in the development of Geographic Information Systems. As a result of this collaboration was published in «Estudios Geográficos» the first article on Geographic Information Systems -according to our data- in Spanish Geography magazines (Herrero et al., 1980).

During the first half of the eighties an active group of Geography teachers from all the Universities in Madrid and from the Open University was consolidated; their common denominator was the use of information technology in their research work. The group held its meetings in the Department of Human Geography at the Complutense University (Cebrian, 1982), having as its preferential subject the development of Geography infotech systems, as is stated in their publications for instance (Jiménez and Cebrian, 1984). On these dates the use of the Geography information systems starts in other fields such as planning, line in which we would like to refer to a publication in Catalonia about the application of Geography information technology systems MAP to local planning projects (Alegre et al., 1983)

In 1983 the Congress on «Quantitive Geography, concept and methods» was held. In its organization there were three participants: the Madrid group, the IGN -directed at that time by Professor Murcia- and the University of Oviedo. As a result of that Congress, the «Group of quantitative methods in Geography» was created seeking its recognition by the AGE which in fact was subsequently obtained.

Starting from 1985 many centers have been created to carry out geographical research related to the use of information technology and methods, particularly the application of Geography information systems. With reference to the original group from Madrid it is necessary to mention contributions from the CSIC and from the University of Alcalá de Henares, although there are a lot of Universities working on similar applications. Apart from the university area the work done by the environment agency of the Junta de Andalucía on applications of Geography information systems is also important.

The work carried out by the CSIC in this field consists, almost exclusively, of a conceptual clarification on the meaning and significance of the new equipment in order to place them at the service of geographic teaching and investigation (Cebrián, 1987, in press; Cebrián and Mark, 1986 & 1987; Cebrián, Mark and Lauzon, 1989).

In the University of Alcalá nevertheless, the orientation is clearly applied. In the works carried out in this Department of Geography, Geographic information

technology systems constitute an instrumental block for works of geographical research or the application of this research to tasks of environment evaluation and diagnosis. In some cases the cartographic component is predominant such as in professor Sancho's studies (Sancho and Chuvieco, 1986; Chuvieco and Sancho, 1986). In other cases, the emphasis lies on the verification of the hypothesis of the statistical analysis of space area, as in professor Bosque's works. In others, finally, teledetection is used in order to accomplish inventories of vegetable coverings and uses of ground or to detect risks of environment impacts (Chuvieco, 1985, 1986, 1990; Chuvieco and Congalton, 1988, 1989).

On its part the Environment Agency of the Junta de Andalucía has been working since 1983 on the creation of an environment information technology system (Sinama), implying the adoption of a GIS and teledetection, orientated towards the evaluation of natural resources. The system has been designed to be used on three levels of scale. A level of territorial reconnoitre, to obtain information and cartography on a scale of 1/100.000. A level of demidetail, on scales of 1/50.000 -1/25.000, in which digital information of the region (87.000 km²) is actually bringing out and on scale of 1/10.000 only for protected spaces. The Sinama has been designed not only as an instrument of control and management but also as a new form of approach to the creation of territorial information in the context of public behaviour.

Concerning the propagation of such methods, special mention must be made of the «third meeting of the Quantitive Methods Group in Geography of the AGE» held in Cáceres september-october 1988. This Conference signifies, in a certain way, the spark which caused the propagation of the unprecedented use of infotech media in geographical research. The success of its participants -practically all the departments of Geography in the country were represented- was unquestionable. Professor Gurría, the secretary of the Conference in Cáceres, was elected President of the Group of Quantitive Methods in Geography of the AGE. Since that moment, initiatives in using Geographic information technology systems have continued without interruption. The influences of such initiatives were evident in the fourth meeting of the Group of Quantitive Methods, held recently in the Balearic Islands. The fundamental issue is that the isolated initiatives of the seventies have now crystallized and that Spanish Geography professionals have assimilated the new techniques.

AUTOMATIC CARTOGRAPHY

Together with the techniques previously mentioned, the years we have referred to have also implied the incorporation of new techniques in automatic cartography for geographic teaching and research. To understand the present situation one is bound to go over what was in the first place the status of cartographic studies in Spain within the academic University Geography sphere. In the second place, one must also remember the progress in automatic cartography during the last twenty years.

Except for few exceptions, the systematic learning of conventional cartographic methods and techniques (scale, projection, generalization, sources, etc..) within the scope of Geographic studies has been carried out in a marginal and complementary way with reference to the basic syllabus of an M.A. in Geography.

Thus, normally, the provision of courses on basic cartography is made in the second cycle of studies when the student has already studied several subjects which needed a documentary support of maps and aerial photographs. In consequence, the Spanish geographer's cartographic knowledge happens to be limited to the essentials. Probably, this situation will be notably better under the new plans of study at present in a phase of elaboration and whose introduction will forseably be in 1993, as the provision of subject-matters on cartographic techniques is now included in the first year of studies. Formerly, the preparation of thematic cartography to illustrate articles, books or doctoral theses was frequently demanded from a professional draftsman. This fact occasioned the risk of a possible loss of a control of the relationship between text and map.

The present propagation of the automatized procedure for the production of thematic cartography should have provided for the overcoming of those traditional limitations. Nevertheless, insufficient computing knowledge as well as restrictions in the availability of efficient equipment have influenced its development. The following memorandum about the evolution of automatic cartography in Spain takes into consideration these general problematised coordinates.

The first applications of automatic cartography in Spain were developed in the field of urban and regional planning at the end of the decade of the seventies, both in COPLACO in Madrid and in the works of the Plan Director del Area Metropolitana in Barcelona, in a professional context and controlled by architects and engineers. At that time, attempts for a production of automatic cartography were initiated to show the territorial intraurban varieties from the alphanumeric files of the population census, the land register, the motorized vehicles register, etc. The most ambitious project in this field was the one developed by the Information and Documentation Consortium of Catalonia to implement the DIME package to the urban continuum between Barcelona and Hospitalet de Llobregat in 1973 and 1975. The design of the project, which did not come into action, foreshadowed present Geographic Information Technology Systems (GIS).

As is well known, the graphic presentation at that period was based on the impression of characters to obtain more or less intense shades of colour in coroplethic or isoplethic maps. Typical programs were the SYMAP, used in the mentioned centers and in others such as the Geographic Catastral Institute (National since 1978) and the subroutines GRIDS. The first examples of automatic cartography produced with SYMAP for theses and for magazines of Geography and carried out by geographers do not appear until the second half of the seventies. They are still sporadic examples in which the emphasis is often more on the method used than on the content and distribution of the cartographed information. It should be pointed out that the SYMAP program was not introduced in the teaching of cartography until 1983, when the possibilities of micro computing were intuited. In fact, the use of big computers, first with inputs by means of punched cards and afterwards, at the end of the seventies, in an interactive manner by terminal had not stimulated geographers to use automatic cartography programs.

On the other hand, the participation of geographers was noticeable in the interdisciplinary teams formed to interpret the first images of the Iberian Peninsula sent out by the satellite ERTS-1 (later on named LANDSAT) already in the

year 1973. Both in Madrid and in Barcelona University Geography staff were present. In any case, the propagation of methods and techniques of automatic classification of multispectra images among geographers would have to wait until the micro computing era.

The same thing happened in the field of the GIS. Thus, the necessary use of big central computers in the Universities, or the Department of Education via telephone, made the conclusion of the postponed tasks implied in the analysis within the context of a SIG unpredictable. For instance, today's old Map Analysis Package MAP, was not available for use with personal computers until the second half of the eighties. Until then and since its first importation in 1980 by the Service of Territorial Plan of the Generalitat de Catalunya it was only occasionally used by geographers. In fact, other SIGs from this paleo computing age which were developed in other centres, such as in the very National Geographic Institute, did not have a better fate.

Only five years ago it would have been impossible to forecast the reversal of the situation that has been produced since then. Actually, since 1987 in Spain the spread of compatible personal computers in Spanish Universities has cast aside the negative topics that computing sciences carried with them. Thus, programs such as Atlas Graphics or MapMaker in the strict context of automatic cartography, Idrisi or Dragon in the image processor, and the up-to-date versions of MAP for the SIG, are normally used today for teaching and research in most of the Spanish Geography Departments. Normally, together with a physical geography laboratory and a small cartographic laboratory, a computing cartography laboratory cannot be left out in collaboration with other departments such as archeology, geology, etc. The content of the laboratory must be furnished with the usual machines for cartography such as, digital tables, plotter, printing laser, etc.

Finally, Spanish university Geography has accepted the challenge implied in the automation of cartography both for teaching and research. This will promote, without any doubt, a greater interest in cartography within Geography studies.

APPLICATION OF TELEDETECTION TO GEOGRAPHIC STUDIES IN SPAIN

Obtaining data from aereotransported platforms or from sensors set up in artificial satellites has enormously enhanced the possibilities of knowing, every day better, about the surface of the earth. From the moment that a geographer holds a photographic document obtained at a relative distance, in a vertical position and with the possibility of a stereoscopic vision, he can start working on it, pulling out diverse information concerning the physical environment and the traces of human behaviour. Since the decade of the seventies a new possibility has been added: to exploit the enormous bulk of data coming from the artificial satellites.

The Spanish contribution to the Paris Conference made by Professor Chuvieco (Chuvieco, 1984) consisted of an up-to-date revision of the application of this modern technology to teaching and research work carried out by Spanish geographers. Since then, work has been multiplied, universities and research centres have acquired equipment and scientific meetings bear witness to the degree of maturity attained.

On one side, we can mention the contributions of the National Geographic Institute, the Institut Cartografic of Catalunya and the Environment Agency of Junta de Andalucía. These Institutions publish basic series that can be used by researchers or teachers; it is of interest to highlight the covering, at a scale of 1:100.000, of the whole of Spain that the IGN is publishing with Thematic Mapper images. In this sense, the ICC published the series 1:100.000 for all Catalonia with data from a TM sensor; it has also initiated the publication of orthoimages on a scale of 1:50.000 considering the data from the SPOT satellite. For Andalucía there is a series 1:200.000 of the provincial sets with MSS images, also a more specific treatment with the TM sensor, or SPOT images for urban spaces or those with special interest, has been initiated. The thematic exploitation of these data includes an extensive range of possibilities: ground occupation, cartography of fire risk, coast morphology, environment problems, etc. These Institutions have made a notable contribution to this field.

One of the large-scale projects of recent years has been sponsored by the Commission of European Communities. We are referring to the Program CORINE (Coordination de l'Information sur l'Environnement) including the project LAND COVER. The cartography of ground occupation with Thematic Mapper images constitutes a layer of basic information that will help, in a decisive way, to make decisions on environment politics. A reading distinguishing 44 classes at European level, and 64 at Spanish level, is sound proof of the validity of the source and of the excellence of the document obtained. The minimal unit represented has an extension of 25 hectares. This is identified as a homogeneous zone or a combination of elementary zones according to CORINE's environment evaluation aims. In the process of the visual analysis of the TM images the exogene documentation (thematic and basic cartography and aerial photographs) was taken into consideration, reaching in this way high levels of validation. In Spain it was in the spring of 1989 when the tests started in pilot areas; then, seven working teams carried out in a systematic way the complete photointerpretation of the TM images on a scale of 1:100.000 that cover the whole national territory. The National Geographic Institute coordinated the task supplying at the same time the images made and corrected geometrically. Once the corresponding validation has been made, the information was introduced into a Geographic Information System to the rest of the maps on ground occupation of the other community countries which will be incorporated. It is worth emphasizing the pioneering task of our country which has shown its high preparation in the exploitation of this technology. On both occasions, April 1990 in Brussels and May 1991 in Luxemburg, Spanish geographers displayed before the rest of the CE countries the results reached in the production of this kind of cartography.

The different universities are acquiring the necessary equipment to form future geographers in this field and to apply to the research objectives the data coming from the artificial satellites. The fruits of this effort can be seen, among other things, in some doctoral theses directly related with spatial teledetection: Chuvieco Salinero (1985), Martínez Vega (1989), López Vizoso (1989) and María José López (1991); furthermore, there are many in preparation (Zaragoza, Alcalá de Henares, Extremadura, Granada, Málaga, etc). Geographers actively participate in research projects which have as their basis this technology (cartography of fire risk, atlas of spatial images, effects of erosion, climatological studies, etc). In the study plans, now under complete revision, this technology is being

integrated as normalized teaching. The existence of specialized courses or programs of doctorate in which teledetection is a basic subject confirms its importance. The entry of the geographer in the field of professional activity besides teaching is a fact. Studios of territorial studies with a sophisticated equipment in media for the storing and analysis of geographic data require the participation of geographers who every day acquire a formation which is more appropriate to social needs.

Finally, a clear manifestation of the professional competence of Spanish geographers in this field can be seen in the recent publication of handbooks such as Dr. Chuvieco's (1990) in which the basic knowledge, the foundations of the use of this technology and its thematic applicabilities are compiled in synthesis.

Beside the university institutions or research organisms (Instituto Jaime Almera, Instituto Pirenaico de Ecología, Centro de Ciencias Sociales del Consaejo Superior de Investigaciones Científicas, Instituto Tecnológico y Geominero de España, Instituto Nacional de Tecnología Aeroespacial, Unidad de Investigación en Teledetección del Departamento de Termología de la Facultad de Física de la Universidad de Valencia) there are other scientific associations interested in the exploitation of this new technology. The Spanish Society of Cartography, Photogrammetry and Teledetection and the Spanish Association of Teledetection are a group of scientists who normally exploit data supplied by spatial sensors. In the three scientific meetings of the Spanish Association of Teledetection has appeared an excellent manifestation of the works carried out. The first held in 1986, (Asociación Española de Teledetección, 1987) was structured in five great sessions: Thematic Cartography and ground uses, Oceanography and coast morphology, Vegetation and Agriculture, Geology, Geomorphology and Hydrology, and Instrumental Aspects. The second meeting took place the following year at Valencia; here a greater emphasis was given to sessions devoted to the digital treatment of images and to methodology and instrumentation, although the habitual works on geology, agriculture, oceanography, thematic cartography and ground occupation were also included. In October 1989 (MOPU, 1989) the third scientific meeting of this Association was held; as well as the habitual papers there were on this occasion more specific aspects relative to mining research and meteorology. Finally, in November 1991, the IV scientific meeting under the general heading: Teledetection and Environment, took place.

At these four working meetings of the Spanish Association of Teledetection were gathered together over a hundred research papers for which the data supplied by the artificial satellites constituted the fundamental informative base to which different treatments (visual or digital) were applied to obtain thematic results directly related to territorial ordering.

In same line the French-Spanish Colloquium on Teledetection and Integrated Planning of the Territory held in May 1988 under the auspices of the National Geographic Institute and the House of Velázquez is to be remembered. In this Colloquium the subjects highlighted were the application to territorial management in the area of the seaboard littoral, the evolution of rural landscapes, the evaluation of environment impacts and urban and peri-urban planning.

Summing up, the exploitation of the data supplied by artificial satellites has been reaffirmed as a habitual resource in geographic research. This new technology is

sufficiently well known and the geographer, for sure, will move forward every day advancing in the use of this new technology in order to study and represent much better his perennial object of research: the landscape.

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2. THE GEOGRAPHY OF HAZARDS IN SPAIN

J. F. MATEU

The Spanish territory shows a high degree of environmental uncertainty and instability. Floods, droughts, seismic movements and volcanic eruptions are just some of the disasters which can lead to loss of human life as well as serious damage to property and infrastructure. Recent estimates calculate potential losses of 8.1 million pesetas as a result of natural hazards in the period 1986 to 2016 (Ayala-Elizaga, 1987). 75% of these losses are predicted to take place on the Mediterranean seaboard of the Iberian Peninsula where population pressures combine with a proliferation of urbanization, industry and other commercial activities and leisure facilities.

Policies which offer solutions merely on the technical level and aim at reducing these losses have been drawn up by public authorities. Infrastructure, designed to reduce the potential hazard, are perceived to guarantee safety, and hence people take up residence in increasingly more hazardous locations. Thus, while public investments increase so do the losses.

During recent years a succession of disasters have occurred in Spain which have raised social awareness to the vulnerability of the environment. The administration has either revised or created new preventative measures and controls aimed at reducing the losses and at warning the population at risk.

This paper examines research carried out in the field of the geography of hazards by discussing how these problems and the resulting behaviour have been analysed in Spanish geography and whether a methodological renewal has taken place in the analysis of natural hazards. The paper also analyses the most important contributions and the immediate prospects in the field but reference to individual research work, with the occasional exception, is not made.

NATURAL HAZARDS AND GEOGRAPHY

A natural hazard represents a momentary or prolonged instability in the natural system which disrupts the normal relations between man and his environment. The human response to this instability in the physical environment varies according to the level of organization and the technology available to the social group. The cultural and technological levels of the social groups and classes are therefore a measure of the risk levels of the environment. Interpreted in this way, natural hazards are a recurring theme within the paradigm which defines geography as «the relation between the natural environment and the distribution and activities of society».

This paradigm entered into a deep crisis at the start of the 50s in the United States, as determinist theories fell into discredit. However, by the end of the decade and at the start of the 60s, several groups of geographers revised the conceptual bases for a new environmental approach in geography. Thus, geogra-

phers at the University of Chicago introduced a conceptual analysis of man-environment relations related to flooding (Calvo, 1984). The Chicago School, working in the field of natural hazards, and other groups working on other problems, were important in promoting Anglo-American geography in the next decades and particularly in providing an interpretation of the paradigm of the relations between the natural system and the social system. The approach taken by the Chicago School was, however, to come under criticism from other geographical schools (Sauri, 1988).

Meanwhile, Spanish geography was developing along different lines. In the late 60s, the so-called «regional geography», which segmented the physical and human components of a territory, came under attack. The alternative proposed was for a greater specialization among geographers which gave rise to a growing gulf between physical and human geography. Human geography moved towards a social perspective of spatial organization, while physical geography, which at the time was of a minority interest, opted for a thematic division. Hence, the environmental approach did not prosper and the opportunity was missed to train geographers in an awareness of the problems raised at the interface between the natural system and the social system. After 1975, the discipline entered a phase in which the environmental paradigm became further and further removed from Spanish geography.

Throughout the seventies and, above all, in the eighties, Spanish society underwent a period of profound political, economic and cultural change. One reflection of the new social awareness was, and still is, a greater appreciation of the environment. Environmental management and extreme geophysical events worried certain sectors of society who demanded greater public attention. With the consolidation of the democratic system, the offices of territorial management were renewed, environmental bodies were set up, the organigrams and functions of civil protection were redrawn, the legal frames were revised and new meteorological and hydrological information networks were installed.

This new social awareness was also to have an influence on the geography of hazards making the eighties a fruitful decade of renewal. On the one hand, advances made in dynamic geomorphology, analytical climatology and hydrology meant that the phenomenology of certain extreme geophysical events could be diagnosed with greater accuracy; while conceptual tools developed by American geography in the field of natural hazards were incorporated.

In summary, an analysis of geographic studies related to natural hazards cannot be separated from the successive stages in the development of the discipline as a whole in Spain. The growing specialization within physical geography has brought geographers into closer contact with other specialists (geologists, engineers, meteorologists, planners, etc). The environmental approach and its focus on «the relation between the natural environment and the distribution and activities of society» has once again come to the fore. It would seem, however, that both perspectives illustrate the weakness of the conceptual links between physical geographers and human geographers in Spain. Only social awareness, as has been witnessed in other countries, is capable of generating the theoretical debate which can bring together both approaches in the end of the century renewal of the geography of hazards in Spain.

RESEARCH FIELDS

The main research fields have been extreme geophysical events related to climatology, hydrology and geomorphology. The most outstanding research has been undertaken in doctoral theses or has been carried out as a result of the magnitude or social repercussions of a specific disaster. Thus, studies of disasters which have already occurred predominate. More recently there has been an increase in the applied nature of the approach to this work.

Spanish universities on the Mediterranean seaboard have produced most research work; with the most representative contributions referring to studies of droughts and floods. Other instabilities within the natural system have also been studied (earth movements, accelerated erosion, neotectonics, avalanches, etc.); while geographers on the Canary Islands have made important contributions to the study of volcanic eruptions.

a) Droughts

Droughts are cycles of hydric deficit, of greater or lesser prolongation, which have repercussions on social organization.

It is a climatic manifestation devoid of identity if analysed in isolation of its impact on the natural and social systems. The evaluation of droughts provokes serious methodological problems as it is not easy to be accurate about the intensity and the duration of the drought, nor the danger to or the vulnerability of different economic sectors (Pita, 1990 and bibliography).

The research undertaken by geographers has concentrated on the climatic aspects of droughts which affect parts or all of the Spanish territory. Equally, the maladjustment of certain activities, particularly agriculture, has been assessed as well as the inadequacies in the infrastructure which exacerbate the effects of the drought. Throughout the period, 1970-1990, considerations of the environmental and social effects of droughts have become more complex.

b) Floods

Floods are the natural hazard which cause the greatest losses in Spain. They are recurring phenomena due to the conjunction of climatic, geomorphological and hydrological factors which at times are aggravated by direct or indirect human action (Mateu, 1990 and bibliography). Between 1970 and 1990 disasters have occurred with a certain regularity (1973, 1977, 1982, 1983, 1987, 1990) in various areas of Spain.

Spanish geographers have studied these events paying particular attention to the hydrometeorological factors which provoke the disaster, the geomorphological factors which increase or decrease the danger of the hazard, the hydrological parameters of the swell, the geomorphological function of the fluvial systems and the human ecosystem. Thus, making the study of floods, perhaps, one of the most dynamic research fields of Spanish geography in the 80s. The field has generated monographs and joint studies which have diagnosed in great detail certain aspects of the phenomenon. Moreover, in 1983 a scientific meeting was held on the catastrophic rains of the Mediterranean organized by the Instituto de Geografía «Juan Sebastián Elcano» of the «Consejo Superior de Investigaciones Científi-

cas» (López Gómez, 1983 and bibliography) and in May, 1988 an international conference was held on fluvial swells and floods in the Mediterranean basin, sponsored by the «Instituto Universitario de Geografía» at the University of Alicante (Gil Olcina - Morales Gil, 1989 and bibliography). At both events geographers played an important role.

c) Other extreme events

The increasing specialization of geographers has widened the field of the analysis of environmental instability (seismology, forest fires, avalanches, volcanic eruptions, gusts of wind, etc.).

d) The perception of hazards

The main theme in this kind of research is the function of the perceived image in the development of the risk. A distorted perception can generate mistaken behaviour which magnifies the disaster. One area of great interest is the modification of the perception of the hazard as a result of structural interventions as they may create over-confidence and lead to an unadvisable relaxation of the use of space by potential victims.

PERSPECTIVES

During the period under review the geography of hazards has begun to establish itself among Spanish geographers and research which not only examines a disaster which has already taken place has been strengthened. At two recent conferences of the «Asociación de Geógrafos Españoles» natural hazards has been the subject of scientific communications (Calvo, 1986; Ortega; 1991).

Research into natural hazards by Spanish geographers has followed two lines: studies of the physical phenomenon itself and studies of the degree of adaptation and social response to environmental instability.

In the first of these, the diagnosis of extreme geophysical phenomena has led to interdisciplinary research with other scientists working in similar fields and the consideration of hazards as an aspect of territorial planning. The making of maps of hazards, the use of hydrological and meteorological information networks and the application of teledetection are some of the fields open to geographers if they wish to continue contributing to the management of these complex and interdisciplinary problems. This represents a difficult challenge as increasingly this is already an over researched field by other academics and technical specialists.

In the second case, the recent diffusion in Spain of the paradigm of the Chicago School may prove to be a way of generating new contributions in the field of the relations between the natural system and the social system. Despite important similarities it will be necessary to adapt this tool to the Spanish social construct. The geography of hazards is seen by some as a possible link between human geography and physical geography. However, it appears that such a link is not possible through their mere juxtaposition, but will require a theoretical framework which can systematize the nature of such connections.

In summary, the geography of hazards in Spain oscillates between sectorial and global analyses. The reality would be more fruitful if it had been the result of previously designed processes.

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3. STUDIES ON HIGHLAND REGIONS: A REVIEW

INTRODUCTION

V. CABERO (COORD.)

Studies of mountain zones have undergone a radical development in recent years, so that today this field has become one of the most popular research areas for Spanish geographers, in particular for those researchers recently entering the discipline and their preceding generation. It is the mountains which hold the key to an explanation of the most contrasting landscapes in Spain and which incorporate into their very being an attraction which is both complex and diverse. Thus, every researcher and geographer has to seek explanations from a dual yet converging perspective: from the ecological potential of a delicate environment, laden with its own limitations, and from man's capacity for adaptation by using various systems of natural resource management, characterized by a highly integrated organization of space.

Various events of a cultural, administrative and political nature have recently contributed to a reawakening of the interest of Spanish geographers in the country's mountain zones; among the more important of these are the new socio-political organization based on the regional autonomies, the Mountain Agriculture Law (1982), Spanish entry into the E.E.C. (1986) and, also, the growing concern for the socio-economic crisis being suffered by the upland areas and for the environmental problems resulting from their transformation and integration into the new forms of territorial relations, dominated to a greater or lesser extent by urban pressures.

Several scientific meetings have reflected this interest and it is worth recording some of them, albeit in passing: The Region and Spanish Geography, 1979; Spanish-French Conference on Mountain Areas, 1980; the VIII National Conference of Geography, Barcelona 1983; Mountain Workshops, Riaño 1984; workshops on the problems of the mountain municipalities of the Cordillera Cantábrica, Pola de Lena 1985; and the Conference on Agriculture and Rural Development in Mountain Zones, Granada 1985. It seems that it was in 1985 that the concern for, and the number of publications related to, Spanish mountains reached its highest point. Various talks related to Agricultural Geography (1985 and 1987) have also looked at the problems of upland areas, particularly with reference to forestry, while several specialist journals maintain a continuous interest in, or have dedicated monographic editions to, the problems of mountain areas. Furthermore, each department of Geography in all the Spanish universities has at least one researcher specializing in studies of highland regions, yet there exist very few groups of an interdepartmental or multidisciplinary character sharing a similar methodology and using the same models of interpretation in

attempting to understand the complexity of these areas. Doctoral theses and undergraduate dissertations have been the most usual academic path taken by Spanish geographers in approaching the study of this difficult world of mountains and *sierras*, which occupy almost a third of the country's surface area.

The area which has received by far the most attention from the researchers has been the Pyrenees, followed by studies of the Cordillera Cantabrica, the Sistema Central, the Sistema Ibérico, and the mountains of Andalucía. Finally, but by no means least, come the mountains of Galicia and León, the Catalan mountains, the Montes de Toledo and the upland relief of Extremadura, the upland environments of Murcia and Albacete and the upland areas of the islands.

A review of these studies reveals five main fields of research. Firstly, there is a preponderance of studies related to the primary sector, either focusing on the evolution in stock-breeding or the transformation of the traditional agricultural models; less emphasis has been placed on land use changes and vegetation. Secondly, a large number of studies have concentrated on the dynamics of the landscape, attempting to integrate the duality of the physical environment with anthropic action, based on a largely integrated methodology. Also a high percentage of studies are based on a discussion of development issues set in the frame of the region or *comarca* with direct implications for regional planning; hence, giving an applied sense to geographical analysis. Closely connected to these studies are those which have concentrated on demographic evolution and changes in settlement patterns, together with a consideration of the phenomena of tourism and second homes. Fifthly, and finally, some geographers have focused on the physical environment, particularly its geomorphology, and thereby contributed to a greater understanding of natural landscapes in Spain.

3.1. THE NORTHERN AND CENTRAL MOUNTAIN RANGES OF SPAIN (CORDILLERA CANTÁBRICA, MONTAÑAS GALAICO-LEONESAS AND SISTEMA CENTRAL)

V. CABERO

In the early 70s the study of the Cordillera Cantábrica and the mountains of the North-East was initiated following a truly integrated approach, either working within the framework of the region or the *comarca* (Ortega Valcarcel, 1969, 1974, 1975; Bertrand, G., 1972; Manero Miguel, F., 1972) or within a more global and general perspective (García Fernández, 1975). These studies maintained the dual dimension of geographic analysis: the ecological and the social, by defining the mountain as a space strongly influenced by man, in which the rural landscape and the organization of cereal production, stock-breeding and rough grazing land constitute the bases of anthropogenic action. Such an approach has its origins in the classic studies of M. de Teran (1947, 1949) and Martin Galindo (1961) on the Pas Valley and the mountains of León. Also during the 70s, the rural environment of the Basque Country and Navarra was studied (Floristan, 1970; Torres Luna, 1971), thus obtaining an approximation to an understanding of the Cantabrian mountains, which would be a starting point for later research into specific sections of the Cordillera, the Basque country and Navarra and the mountains of Galicia and León. It was also at the end of this decade that research was once again begun in the Sistema Central, out of which developed a collection of

monographs both of a regional nature and in specific fields of research, particularly geomorphology, which were of great geographical importance (Martínez de Pisón & Muñoz Jiménez, 1973).

In recent years, centered on the geographical journal of *Eria* and the Geography Department at the University of Oviedo, a systematic study has been undertaken of the Cantabrian mountains, particularly the slopes of Asturias and León; while, stock-raising, the organization of arable land, the communal uplands, the demographic crisis and the changes in mining have come in for special treatment (Rodríguez Gutiérrez, 1984, 1989, 1990; Maceda Rubio 1985; Maurin Alvarez 1985; López Fernández, 1986). There is also no shortage among the publications of references to the mountain par excellence: the Picos de Europa, the backcloth to these landscapes.

This work is closely linked with research carried out in the Department of Geography at the University of Santander and the Cátedra of Cantabria, in which the evolution of rural society in Cantabria is examined at different levels (Corbera, 1983; Ortega Valcarcel, 1987), together with studies of the ecological potential and the physical environment (González Pellejero, 1986; Frochoso Sánchez, 1990). An excellent synthesis of these lines of research appears in the book *Los espacios rurales cantábricos y su evolución* (García Merino et al. 1990).

The Department of Geography at the University of Salamanca has also undertaken a study of the mountains of Galicia and León (Cabero Dieguez, 1980, 1982), from an ecological and regional perspective, a line of research which converges with the work being done at the University of Valladolid into other mountainous sections of Castilla y León and with the work undertaken years later at the University of León. A good summary of these studies is available in the collective work on the comarcas of the province of León (1988) and in the works dealing with the Montes de León and the *fosa berciana* (Luengo Ugidos, 1990). The picture is completed by the Galician contributions which have shown a particular interest for the study of their mountains (López Andion, 1985; Guitian Riera, 1988), and with the integrated studies carried out in West Zamora (Plaza Gutiérrez, 1984, 1991).

A separate mention should be given to studies made in the Sistema Central, concentrating mainly on the Sierras de Guadarrama and on the Gredos massif; the great attraction of these sierras lies in the quality and variety of their landscapes and in their proximity to Madrid, whose universities have concentrated a part of their studies in an understanding of mountain environments with a strong human influence. Recent work on Gredos and its surrounds is illustrative of this (MOPU, 1990). Although the naturalist contributions stand out for their importance (Martínez de Pisón et al., 1977; Bullón Mata, 1986, 1988; Sanaz Herraiz, 1988) other work is of great interest; such as those studies which emphasize territorial planning (Barrientos Alfageme, 1978; Troitino Vinuesa, 1976, 1986, 1987, 1989; Redondo González, 1972; Cruz Reyes, 1983) and the incidence in the landscape of the speculative transformation of the sierras due to secondary residences and its conversion into an enormous leisure space (Valenzuela Rubio, 1977, 1981; Canto Fresno, 1980).

It is also necessary to mention here the contributions made in more westerly mountain areas at the universities of Salamanca and Extremadura. These studies

complete the geography of the Sistema Central by describing the ecological and human complexity of the sierras in the west of Spain (Gurria Gascon, 1984; Llorente Pinto, 1989, 1991). For a better understanding of the diversity and subtleties of the mountain organization the work on the *Comarcas tradicionales de Castilla y León* (Cabero et al.1990) is useful, as it focuses on the mountain zones which form the borders of the region.

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3.2. THE MOUNTAINS OF THE NORTH-EAST OF THE PENINSULA AND THE BALEARIC ISLANDS

R. MAJORAL

Among the mountains of the north-east of the peninsula, the mountain range of the Pyrenees has, without any doubt, generated most interest among Spanish geographers and researchers in general. However, this interest is not new, as can be seen by the excellent studies which have been made of the mountain range since the 30s (Sorre, 1933; Sole Sabaris, 1951), but in recent decades it has grown. The interest is reflected in the work which has been carried out either by geographers working individually or in groups, or contributing to interdisciplinary studies, in which the degree of participation of geographers varies according to the individual case. This great interest for the Pyrenees does not, however, imply that studies or publications related to the rest of the mountains in the north-east of the peninsula and the Balearic Islands do not exist, rather that they are fewer in number.

The existence in Jaca (Huesca) of the «Instituto de Estudios Pirenaicos» since the 40s («Instituto Pirenaico de Ecología» since 1983), has contributed greatly to the publication of a significant number of studies and papers. These have largely appeared in the institute's journal *Pirineos* or been published as a result of the seven conferences held there, at which geographical contributions were great.

The mountains of north-east Spain and of the Balearic Islands, mainly the Pyrenees but also the Sistema Iberico and the rest of the smaller mountain ranges, have been the focus of a considerable number of undergraduate dissertations and doctoral theses, including both regional studies and studies of *the comarca*. The majority have been written in the last two decades in the Geography Departments of the area's universities (Barcelona, Autónoma de Barcelona, Zaragoza Palma

de Mallorca and Pamplona) and have been entirely or partly published in books or articles, largely in the journals of the Departments (*Revista de Geografia, Geographicalia, Documents d'Anàlisi Geogràfica*), or presented as contributions at different symposiums or conferences. These theses cover a wide range of research fields related to the geogaphy of mountain areas; geomorphology (Gómez Ortiz, 1980; Peña, 1980; Pellicer, 1983; Bru, 1985; Pérez Cueva, 1985), climatology (Creus, 1983; Cuadrat, 1983; Xercavins, 1981), ecology (Calavia, 1985), population (Ferrer, 1973; Silvan, 1980), agriculture (Tulla, 1982; Lasanta, 1988), natural resource use (López Palomeque, 1982; Molina, 1980, Fillat, 1980, Chauvalier, 1987) and regional (Daumas, 1974, García Ruiz, 1975; Salva, 1980).

Furthermore, the Pyrenees have provided the setting on numerous occasions for both national and international talks and meetings. Periodically between 1950 and 1974, and alternating between Spain and France, seven international conferences entitled *Estudios Pirenaicos* were held giving rise to a considerable volume of literature among which the geographical is very important. The last of these conferences was held in 1974 thus breaking the links between Pyrenean geographers on both sides of the mountain range and putting an end to the publication of an important source of materials which were regularly presented at these meetings, as can be seen, in volume 5 of the Proceedings of the last conference.

At three of the conferences of the Asociación de Geografos Españoles, held in Pamplona (1981), Barcelona (1983) and Zaragoza (1987) respectively excursions were organized to different parts of the Pyrenees and the corresponding guides published (Creus, et al., 1981; Majoral y López-Palomeque, 1983; Serrat, 1983; Cuadrat et al.; 1987). Moreover, on two occasions, commissions from the International Geographical Union have met and made excursions in the Pyrenees. These were the commission for Rural Development in 1983 and for Mountain Geocology in 1986, and in both cases a guide of the excursion was published containing papers related to the areas visited (Majoral and López Palomeque (Eds.), 1984; Puigdefabregas (Ed.), 1986).

Finally, in Huesca in 1985 several workshops were organized on alternative utilizations of space in mountain areas in which several studies on the Pyrenees were presented and later published (Rubio & Castello, 1986). Contributions on the mountain chains under review have also been numerous in talks held on upland areas in recent years (Madrid, 1981; Asturias, 1985; Granada, 1985; etc.). We should also add to these the summer courses (*Cursos d'Estiu d'Estudis Pirinencs*), which are held annually in La Seu d'Urgell since 1982, and the subsequent publication of papers and contributions in which several geographers collaborate each year.

The volume of research papers on the mountain has been increased, again largely with relation to the Pyrenees, as a result of the appearance and implementation of the laws on Mountain Agriculture (1982) and the laws or programmes of the various autonomous communities: DIADENA Programme (Integrated development of the disadvantaged areas of Navarra) and the law of the Catalan Upland Regions, for example. The latter has generated detailed studies of the different Catalan *comarcas* (*Plans Comarcals*), to which several geographers have contributed.

Other studies worthy of mention are the implementation of the MAB programme in an area in the upper Segre, with the collaboration of the Department of

Geography at the Autonomous University of Barcelona which has generated a thorough study of the area, a significant number of studies comprising 18 volumes (1985-1990) and a monographic volume of the journal *Documents d'Anàlisi Geogràfica*. Moreover, in recent years groups of geographers have carried out studies with the financial backing of various official bodies: RUBIO et al., 1986; Majoral (Dir), 1989; López Palomeque & Fillat 1988.

Finally, we should mention the contribution by several financial groups to the publication of studies of the mountains in this area, either solely by geographers or in collaboration with others (e.g. Caixa d'Estalvis de Catalunya: Col. *Catalunya Comarcal* containing many monographs of the Catalan mountain *comarcas* and the Banco de Bilbao-Vizcaya: A monographic volume in the journal *El Campo. Boletín de Información Agraria*, dedicated to the Spanish mountains).

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3.3. THE MOUNTAINS OF THE SOUTH OF SPAIN AND THE MONTES DE TOLEDO

F. RODRÍGUEZ-MARTÍNEZ

The attraction of the great Andalusian valley and of the fertile plains of the interior, as well as those of the coastal areas, where both the population and the most important economic activities are concentrated, has for decades diverted the attention of geographers towards these areas thereby contributing to a false perception of certain regions, such as Andalusia, which is by no means the region of highly fertile plains that at times it is said to be. Hence, the last two decades (1971-1991), and more particularly the latter, have brought about the recognition of the quantitative and qualitative importance of upland areas which represent more than 60% of the area of this Mediterranean region, and resulted in a growth in the number of doctoral theses, books and articles dedicated to this subject. Undoubtedly the new sociopolitical situation following the creation of the regional autonomies has contributed to this awareness as it has meant a break with earlier development approaches which were exacerbating the crisis faced by these areas, leading them into abandon and/or marginalization.

In the 60s the scientific response to the problems facing the Andalusian mountains consisted of little more than specific studies of a naturalist character, such as those undertaken by B. Messerli, or landscape studies, with their roots in anthropology and/or sociology, in accordance with the approach outlined in the classic studies of M. Sorre, J. Sermet, Pitt Rivers and G. Brenan. Towards the end of this decade a turning point was reached heralding a new approach with the publication of J. Bosque Maurel's work at the XXI Congress of the I.G.U. (1968) which, for the first time ever, attempted an analysis of a landscape and rural economy on the point of collapse, but which still kept alive most of its traditional characteristics. From 1970 onwards, and under the direction of Bosque Maurel, the first regional studies of mountain comarcas were undertaken at the University of Granada, although in many of these works attention was diverted away from the mountain and focused instead on landscapes of the lowlands and the valleys of the interior. Perhaps the contributions which best managed to maintain their focus are those of F. Ortega (1974) who began with his study of the Southern Córdoba an analysis of what might be termed the Lower Andalusian model of the middle mountain, and of F. Rodríguez Martínez (1977) whose study of Serranía de Ronda tackled the problems of a highly complex mountain area due to the diversity of its interrelated elements.

Further research undertaken in the seventies, the greater part of it at the University of Granada, developed subjects of a much more sectorial nature. In the field of geomorphology two works stand out; the studies of M.C. Pezzi of the Andalusian karst (1977) and those of R. Lhenaff (Paris) which were incorporated into the first overall attempt at a geomorphological interpretation of the Andalusian mountain chains. Although related to agricultural organization the work of J. Bosque (1974 and 1979) is of importance as the area of research coincides more or less with the area under review. Finally, mention should be made of B. Roux's (1975) then interestingly novel study, although excessively economic in its approach, of the agricultural crisis which the region was suffering.

The majority of the works mentioned adopted a descriptive approach, at times excessively so, and suffer from the lack of a global perspective, so that frequently

they amount to scarcely more than case studies on which interpretative models can hardly be based. This tendency continued even up to the 80s and can even be seen in some works of synthesis such as those written by J. BOSQUE (A.G.E., 1980), and the GRUPO E.R.A. (*Estudios Rurales Andaluces*) which in relation to mountain areas locates them within the framework of the Andalusian systems of production.

This situation was to undergo notable changes during the last decade. Firstly thanks to the publication of studies, such as CH. MIGNON's (1982) which tackled the mountain problem from a wider perspective and within a wider regional context albeit with an overly economic approach in its interpretations. This work, undoubtedly of great importance, limited itself to an intelligent and discretionary use of many earlier sectorial and/or specific studies

The renewal of mountain studies, however, was brought about principally as the result of the following events:

Firstly, The number of new and excellent sectorial contributions which unlike earlier studies were based on a global approach and, above all, set in a different methodological and technical context, being in general more open to other disciplines and less descriptive. Outstanding contributions have been made in geomorphology (Díaz del Olmo, 1982; Martín Vivaldi, 1989); in demography (Carvajal, 1980; Jorda, 1985); in landscape studies (Pezzi, 1981; Rodríguez Martínez, 1985 and 1988; Molero Mesa, 1987; Fourneau-Casa de Velázquez, 1980 and 1985); in studies of tourist resources (Calatrava, 1983; Marchena, 1987); in research related to hunting (Valle Buenestado-López Ontiveros, 1987-1990), forestry (Arias, 1981) and mining (Gil Varon, 1984). A vital publication to this effect was the 11th volume (1981) of the journal «*Cuadernos Geográficos*» (Granada), dedicated to the Sierra Nevada and in honour of J. Sermet, as well as contributions to the joint Spanish and French talks on the Sierra Nevada and its environment (1985).

Secondly, the needs of the new territorial organization of the autonomies and the more pragmatic vocation of geographers in recent years, has led to the publication of studies of regional planning, among which the most significant are those of M. Benabent (1986), F. Rodríguez (1981, 1985, 1988, 1990) and F. Zoido (C.E.T.U., 1990).

Finally, all this has led, to the progressive rejection of the regional case study in favour of the proposal of models which are applicable to different mountain environments. As has been the case of the Sierra Morena (Casa de Velázquez, 1985; Rodríguez Martínez, 1990); the exterior Pre- and Lower Andalusian Mountains (Araque Jiménez, 1991), the Lower Andalusian Mountains (Humbert, 1987) and the Andalusian Mountains (Justicia Segovia, 1988, Ruiz Sinoga, 1987, Gómez Moreno, 1987, García Martínez, 1988, Jiménez Olivencia, 1990). The focus of this research ranges from historical-landscape studies to studies of the ecology of the environment and they represent substantial contributions in changing the traditional hypotheses of the mountain areas of Andalusia.

Our understanding of The Montes de Toledo mountain system has also undergone considerable change particularly in the last decade. Above all changes have occurred in physical geography where the work of J. Muñoz Jiménez (1976) has contributed in particular, to clarifying the geomorphological interpretation of

much discussed aspects such as the lower lying mountains. Important contributions have also been made in human and economic geography as well as regional studies e.g. those studies undertaken by Panadero (1986), Pillet (1986) and Gurria (1984).

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4. RURAL-URBAN AREA DYNAMICS

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INTRODUCTION

Country-town relationship has experienced a great transformation in Spain for the last quarter of this century; at the same time, the whole country has experienced important changes in its economic basis as well as a progressive concentration of activities and of population in urban spaces which have become irradiation centers for its nearby rural areas. This has meant more attention and a diversity of treatment on the subject of country-town relationship in the Spanish Geography of the eighties.

In traditional approach which dominated until the end of the fifties, the relationship between country and town was considered from two fundamental perspectives: the town as a place of absorption of immigrants and the town as market for agrarian products and deposit of rural capitals. As for the Spanish case, said dependency achieved an interregional dimension to the extent that many agrarian-based Spanish towns experienced a fate not very different from that of their rural environment. Migratory movements, specially the interregional ones, were a dominant subject during the sixties and seventies. Concerning a more direct relationship between the town and its nearby rural areas there was a clear differentiation between both milieus. Nevertheless, the conversion of rural spaces into suburbs of bigger or industrial towns and the birth of the tourist phenomenon attracted some researchers as being new spatial-occupation patterns unknown until then.

The transformation of the Spanish productive system started in the sixties and signified an accelerated decline of the agrarian sector in the productive system, modifying therefore the basis for country-town relationship. The rentier town, defined by Juillard and which could be identified with many Spanish middle size towns, progressively loses this character. It is a fact that the relations among productive sectors have become modified as in every industrial economy: towns are not only consumers of agrarian products from their nearby rural areas as well as the residence of rural landowners, but rural space increasingly depends, for its own productive system, on town-generated services. Parasitism, a characteristic of the so-called rentier town, is not in force in nowadays relationship, even for those towns which polarize a space of agrarian basis.

Employment pressures resulting from the contrast between a high density of activity in the urban space and a low density of activity in the rural space appear to be a fundamental key in country-town relationship.

Spanish rural space continues to be basically agrarian and under different concepts said main activity appears in towns. As in the classic model, distance to town marks the main nuances, but town is not anymore just a market for agriculture products, far away from regional or local markets. Now the reason lies in the possibilities of employment within the urban space. The agricultural part-time model taken by peasant-workers in towns is the answer to these

employment pressures between adjoining spaces. The extent of this phenomenon is very important in Spain. We should remember that, as a differentiating fact from other industrial countries, changes of the productive system are territorially incomplete and that a great part of its territory has an important farming population.

Town-country relations where town becomes the employer of the rural population are logically lessened when the everyday migration distance thresholds are crossed. As in the past, said relationship signifies a rural exodus for the farthest area. Setting aside the important phenomena of relocating the population in the rural space (leaving the scattered sites, concentrating in the centers and enlargement of district headquarters), a rural exodus, of such a relevance in past decades, has been held back in recent years in Spain. The population has remained either thanks to aids to unemployment, or to the inability of the town, at this moment, to offer employment, or to the inability of the town, at this moment, to offer employment. However, we have to mention that this exodus, at provincial or regional scales in general, is still valid. As a dominant process it has been progressively restricted to more isolated or marginal sectors of rural areas.

Together with the urban employment offer, the spatial availability in the rural area is the second important factor in the interaction between country and town. After the sixties, Spanish towns experienced a general process of territorial expansion so rural spaces were increasingly settled by the urban population through urbanized promotions. The so-called second residences for temporal use have become more scattered and are located at greater distances. The subject of country-town relationship, as rivals for space, has provoked as expected a renewed attention both in its economical facet and in its sociological relationship. Attention given to this rivalry for space (similar to the one established for other resources such as water) has been specially decisive for territorial planning in and out of academic contexts.

A very important aspect, related to economically more dynamic towns, has not only been the outer location of urban residential areas but of productive activities, that is industries moving from the town or near its neighborhood. Said urban, industrial and residential expansion has not been limited to the neighborhood of large towns although it has reached extraordinary dimensions in the largest Spanish towns. In consequence, the traditional rural-urban opposition has decreased also increasingly in Spain, and it can not account for a rural reality much more complex, not for the human and territorial significance that rural-urban, periurban and suburban areas have acquired. The same typification of this rural-urban continuum has been the center of attention, specially in more urbanized areas.

Special attention, as would be expected in a country like Spain, has been paid to the peculiar country-town relations generated by the development of tourist «urban» centers. The origin of this urbanizing process has been mass tourism, hence from a territorial point of view the space most affected has been the coast. The different Spanish coastline has followed very different processes. Nevertheless, the prevailing process has been the superposition of the tourist activity on a preexisting physical and social framework which has been transformed without establishing any productive relationship with either of them, except the by-product of speculation of the land and the subsequent occupation of an important part of the population in this new activity. At the beginning, the tourist

towns developed totally indifferent to the space on which they were growing, however, a new environment was created in which all the parameters of local productive activities had been notably affected and subsequently social behaviour has been profoundly shaken. The key lies in the high value of land, in the subsequent un-profitability of traditional agrarian activities and in the jobs offered by the tourism activities.

In consequence, towns are space consumers under several concepts. It is so because the residential areas are spreading and scattering, because the industrial activities have new needs and because a more mobile population and with a higher standard of living needs space for leisure.

Both tendencies have different effects, but the main spatial effect is that urban expansion phenomena have generated in the towns some extension fringes very different from the diffusion focus. They are the so-called periurban areas, where a major transformation of space takes place, where major investments occur and where new population groups settle. Its features of space organization, its social contents, its productive system are losing their rural content and acquiring an urban one.

Since the end of the sixties, the extraordinary expansion of Spanish geography has multiplied teaching staff at Universities. Within the great wealth of geographic research which accompanied this development, the attention of many geographers was attracted to periurban phenomena which were happening at that time on the outskirts of Spanish towns. The result has been the appearance of a great number of works which analyze all the aspects related with country-town dynamics, and it is difficult to synthesize them. We can only mention those working lines most frequently dealt, and acknowledge that only some examples have been chosen, relatively few in comparison with their great variety. This implies that there are many gaps in this list of works and subjects.

TOWN GROWTH IN PERIURBAN AREAS. GENERALITIES.

Within a general approach, processes generating the advance of the town over its close fringe has been studied in different periods and according to the incidence that urban planning has had in this process: Studies on Baleares (Petrus, 1985), Sevilla (Vaquero, 1985), Lorca (Ibañez, 1985), Manresa (Oliveras, 1985), Albacete (Cebrian, 1985) and Murcia (Plans & Serrano, 1985).

Taking as a basis the tendency observed in post-industrial countries, where there is a demographic halt in urban areas versus an accelerated growth in metropolitan areas, the evolution of demographic growth, urban growth and periurban growth has been analyzed globally in local or general works. They point out the process of industrial deconcentration in urban areas and the introduction of dispersed industry in periurban areas. Besides local or regional studies, there are also works on all the national territory.

Within this general approach to town growth in its periurban areas, other analyses have focused on the different aspects of housing expansion:

Studies on location of residential areas

Taking as a basis the natural or induced quality of the environment, the presence or absence of services and means of communication, authors have pointed out the

diversification and sorting of these spaces in relation to the use of the urban environment according to the quality of housing. Thus the following items have been studied:

a) Location of marginal housing areas in periurban fringes which act as buffers for rural immigration, or population leaving degraded urban centers with low social level and high unemployment. They generate spaces of shacks or self-built housing, which are authentic social ghettos. The studies on Albacete (Panadero, 1985 and García Martínez, 1985), Lérida (Villagrasa, 1985) and Sevilla (Vaquero, 1985) follow the same approach of other works on the cities of Madrid and Barcelona, published in the second half of the seventies.

- In other areas, cheap land has multiplied cheap public housing (Madrid (Moya, 1983), Lérida (Villagrasa, 1985), Tarragona (Roquer, 1985)) as well as cheap private housing.

b) There are also many studies on quality periurban space receiving a high proportion of the urban expansion seeking a high standard of living. Analyses refer to the whole range of social strata which these new residential spaces reflect:

- One-family houses with cheap land and with daily commuting of its population to jobs in town. The recent multiplication of groups of semidetached houses can be related to them: (Murcia, (Argente del Castillo, 1985), Baleares (Socias, 1983 and 1985).

-Housing estates of a high standard of living in some towns (Bilbao, Ortega, 1985).

-The extension of second residences. They follow the line of works, published in the seventies, on its generalization in the big cities (Madrid, Barcelona) and also in coast towns, where it is mixed with tourist residential areas. Geographers have studied the expansion of the seaside tourism, given its exceptional importance as changing element of periurban spaces on the coast. It has been studied along all the Spanish coast (see contributions under tertiary activities) and with reference to the outskirts or large towns (Valencia, Miranda, 1985 a).

Studies about social differentiation

The residential function of periurban space has given way to studies about the social differentiation of new inhabitants versus the locals and of the new residents among themselves, as their differences and behaviour might even be greater than in comparison with the local inhabitants.

Two sources have been used for these studies:

a) The most common one has been the statistic data supplied by population census and electoral lists. Data on new residents have been taken and detailed: age, occupation, levels of education and professional status. The different working activities show a predominance of secondary and tertiary sectors in certain periurban areas –in general there is a coincidence with quality housing– and of industrial activity in the rest. The major incorporation of women to work has also been pointed out. The enumeration of studies is too long; among them we mention those referring to Sevilla (Caravaca, 1985), Baleares (Bauça, Crespi & Ortega, 1985; Grimalt & Rodríguez, 1985; Socias, 1985)), Murcia (Sánchez

Cañizares, 1985), Quiñonero, 1985), Lorca (Ibáñez, 1985) Madrid, (Camarero, 1985), Granada (Fernández & Pérez, 1985), Huelva (Monteagudo, 1985), Málaga (Martin García, 1986; Ocaña, 1988), Tarragona (Roquer, 1985), Valencia (Miranda, 1985 a), La Coruña (Miralbes, Rodríguez & Villarino, 1984).

Most works on periurban housing location include social studies about their population.

Electoral behaviour of these new residential areas has equally been studied with other statistics (Murcia, Navedo, 1985).

b) Another source is the survey: for example, social habits in shopping areas, personal relationship, etc. (Murcia, Argente, 1985; Lorca, Sánchez Galindo, 1985).

Studies about location of new periurban space functions.

a) Industrial activities.

In general, location of industrial activities is seen from two perspectives. From the point of view of their expulsion from the urban centers, due to congestion, in contrast to the attraction that periurban spaces exercise because of factors such as promotions (industrial states), roads, etc. Studies about Asturias (Benito & Morales, 1985), Madrid (Méndez, 1983; Del Canto, 1984; Bosch, 1985; Crespo & Elena, 1985; Celada, López & Parra, 1985), Cataluña (Oliveras, 1985 a and b; Roquer, 1984) and Galicia (Santos, 1981) have insisted on all this.

Another perspective is the expansion of industry in rural areas, not necessarily close to huge industrial towns, within processes of «endogeneous development». We can mention studies on Andalucía (Granados, Seguí, García & Gabilondo, 1983; Sánchez, García, Ortiz & Ruiz, 1983; González Enriquez, 1983), Castilla-León (Sancho Hazak, 1983), Cataluña rural districts (Barcelo, 1983; Petitbo & Soy, 1983) and the Eastern area (Bernabé, 1983; Pena Gimeno, 1985).

Separate mention deserves agro-industrial location, studied in Valencia (Arnalte, 1983; Coco & Juan, 1983), Murcia (Sanz & Gaggiano, 1983; Gómez Fayren, 1984) and Extremadura (González Regidor, 1983).

The wealth of this kind of examples has brought conceptual reflections on whether it is a new model or just an evolution of the preceding one.

b) Location of tertiary activities.

In a lesser number, there are studies on shopping centers (Zaragoza, Bielza & Escolano, 1985), teaching (Valencia, Miranda, 1985 b), while there are many studies about the tourism introduction in these areas, above all in the whole Mediterranean coast: Málaga (García Manrique & Ocaña, 1981; García Manrique, 1984; Gómez, 1983; Ferre & Ruiz, 1985; Marchena, 1987; Marchena & Márquez, 1987), Alicante (Gozálvez, 1985; Vera, 1987 and 1988; Canales & Crespo, 1987), Baleares (Salva, 1984); Cataluña (López Palomeque, 1987), as well as in the Canary Islands (Alvarez, 1981; Hernández Gutiérrez, 1987; Pérez & Hernández, 1987) and Galicia (Duran & Villoch, 1987; Hernández Borge, 1987).

c) Public facilities such as airports (Baleares, Grimalt & Rodríguez, 1985) and sport facilities (Bilbao, Ortega Moros, 1985) or infrastructures which are great space consumers such as reservoirs, etc.

d) Due to the voracity with which periurban spaces become occupied, studies on the need to protect certain natural areas within periurban areas have appeared (Levante, Gozávez, 1985; Ríos & Panareda, 1985; Málaga, Mérida, 1989).

e) Separate mention must be made of land routes. They are considered by numerous researchers as a primordial factor in the configuration of periurban spaces, creating them or affecting them negatively (Balears, Brunet, Dubon & Seguí, 1985).

Flows Studies

Flows appear as one of the features of periurban spaces. Commuting to school (Miranda, 1985), work (Granada, Fernández & Pérez, 1985; Murcia, Bel, 1983; Serrano, 1985; Tarragona, Roquer, 1985; Huelva, Monteagudo, 1985 –application of graphes methods–), shopping (Granada, Fernández & Pérez, 1985, Zaragoza, Bielza & Escolano, 1985), telephone calls (Madrid, Gutiérrez Puebla, 1985) and public services supply (Sánchez Galindo, 1985).

Characteristics of the agrarian sector in periurban areas.

The fact that periurban spaces have been agrarian areas which have suffered a process of transformation towards other sectors, already mentioned, has called the geographers' attention who have analyzed the process of change or activity-Abandonment in these agrarian spaces. The works on usage changes in the agrarian land are numerous given the great number of geographers interested in rural studies.

Three research lines can be pointed out, which can be compatible and even dealt with in one work.

a) Evolution and changes in agrarian land ownership, carried out when there were no perspectives, at least clear enough, of future changes. In other cases, they studied the selling process when industrial or tertiary activities were introduced: Málaga (García Manrique, 1981; Domínguez Rodríguez, 1985), Balears (Socías, 1985) and Madrid (Camarero, 1985; Gómez, Mata, Martínez, Espiago, Rodríguez & Lacasta, 1985). In general this process is mentioned in almost all the works on usage change in periurban areas.

b) Impact suffered by the agrarian activity in contact with town expansion in its area and appearance of new forms of agrarian use. It has been said that, in many cases, the new agrarian orientation depends on if the introduction of tertiary or industrial activities is massive or rather limited to small spaces.

When building on the agrarian space has been massive, agriculture has practically disappeared. In those areas where there is still some agrarian activity, the following situation are given:

– extension, which can produce social waste and expectations of selling for industrial or tertiary uses (Málaga, Ferrer & Ruíz, 1985).

– extension, with part-time agriculture, combined with working in industrial or tertiary activities (Málaga, Carvajal & Gómez, 1985), Madrid (Feo, 1985b; Gómez et al., 1985), La Coruña (Villarino, 1985) and Balears (Grimalt & Rodríguez, 1985). General studies on agrarian space changes have also analyzed the consequences of said changes on local inhabitants (Galicia, Peñas, 1987).

– appearance of family vegetable-gardens with agrarian population in areas not coveted by other activities (Córdoba Cabrera, 1985), Madrid (Camarero, 1985), Baleares (Socias, 1985). Sometimes it appears linked to a second residence.

– Intensification of agriculture with strong inputs, new technology and high quality of products in areas no-massively occupied by residential, industrial or tertiary sectors: Huelva (Márquez Domínguez, 1985), La Coruña (Rodríguez Martínez-Conde, 1985; Villarino, 1985), Baleares (Salva, 1985), Madrid (Camarero, 1985; Feo, 1985a), Málaga (Justicia & Escudero, 1985), Bilbao (Ortega Moros, 1985), Sevilla (Márquez Domínguez, 1985).

– Appearance of specialized farming of high inputs and few labourers coexisting with other land uses (avocado growing in areas massively occupied by tourist estates at Malaga's Cota del Sol) (García Manrique, E., 1981).

– Disappearance of agrarian exploitation due to urban usages (Málaga, Gómez Moreno, 1983; Ferre & Ruíz, 1985), Murcia (Serrano, 1985), Córdoba (Cabrera, 1985), Baleares (Grimalt & Rodríguez, 1985), Canarias, (Hernández Gutiérrez, 1987; Pérez & Hernández, 1987).

GLOBAL STUDIES

The wealth of works about periurban spaces has brought global studies about these areas. Some are of a conceptual type (Calvo, 1989; del Canto, 1985; Valenzuela, 1985; Sancho Martí, 1985; Andrés, 1985; Fernández García, 1985). Other works are descriptive at different scales: national (Precedo, Fernández & Guitian, 1985), province capital cities (Valladolid, González Urruela, 1981; La Coruña, González Encinar, 1982; Monteagudo, 1984) and other regional urban centre (Gijón, Fernández García, 1984).

We have not intended to present all the approaches used in these studies; besides, we have only given some examples of location studies as an exhaustive enumeration would have been impossible in this reduced space.

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5. THE GEOGRAPHY OF GENDER: THE STATE OF THE ART

A. SABATE
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The Geography of Gender has undergone rapid growth in the 80s, especially in the English speaking countries, bringing a new perspective to the spatial analysis of social relations i.e. an analysis of those differences established as a function of gender, interpreted as a social and cultural construct.

The incorporation and subsequent diffusion of this approach in Spanish Geography has followed a similar course, obtaining a considerable degree of acceptance in a short period of time, being evident in the development of several lines of research, its participation in scientific meetings, and even its cautious incorporation into academic curricula.

Its origins in Spain can be traced back to the start of the 80s (García-Ballesteros, 1982; Sabate, 1984a, 1984b), when all references to the new approach were from English speaking countries; in this way the translation into Spanish of some of the fundamental articles in Feminist Geography played an important part in its diffusion (García-Ramon, Ed., 1985b).

It was not, however, until 1985 that a rapid growth of scientific work in the Geography of Gender took place. The importance of the organization of various meetings at this time should be emphasised as they allowed an interchange of ideas and experiences among those professionals incorporating themselves to the new approach and, above all, promoted its diffusion and acceptance by the rest of the scientific community.

In 1985 within the «Women's Studies Seminar» at the Universidad Autónoma in Madrid, a geographical theme was chosen for the first time, having been absent from all previous Seminars, and thereby bringing an additional dimension to their interdisciplinary approach. Thus, an analysis of the use of space in the daily life of women provided for an enriching interchange of ideas among the different social sciences (García-Ballesteros, Ed., 1986)

Within the Geography community, the Geography of Gender was introduced in a formal sense for the first time in 1987, during the II Congreso Mundial Vasco (García-Ramon, 1988), in an occasion which was not free from controversy. In the same year a seminar on «Agriculture, Gender and Space» was organized by the Universidad Autónoma in Barcelona and the papers were published in a monographic issue on «Gender and Geography» of the journal of this university, *Documents d'Anàlisi Geogràfica*.

An increase in the publication of research made evident the need to incorporate gender relations in explanations of a whole range of socio-spatial processes, so that in a very short space of time the diffusion of new approaches was underway, founded on thorough research work.

This climate of debate led to a Round Table discussion of the Geography of Gender at the XI Congreso de la Asociación de Geógrafos Españoles (Universidad Complutense in Madrid) in 1989. This brought together nearly all the Spanish researchers in this field; who (as shall later be seen) can be separated into two main research groups; those at the Universidad Autónoma in Barcelona and those at the Universidad Complutense in Madrid.

From this moment it has come to be accepted that in the various scientific meetings of geographers a paper will be presented which expressly incorporates this approach.

The key elements to this diffusion lie in various aspects: in the development of a range of research subjects in which it has become apparent that by overlooking the rôle of women and gender relations an incomplete picture of reality has been drawn; in the creation and development of a fruitful network of collaboration, interchange and discussion among the different Working Groups in Spain; and at the same time in the maintenance of strong ties with the international scientific community and, particularly, with the Study Group on Geography and Gender of the I.G.U. formally created in Australia in 1988.

MAIN RESEARCH AREAS

An outline of the main research undertaken, grouped according to major topics follows, although at the risk of omitting isolated work of unquestionable interest.

Two basic research interests have so far been developed, both in reference to the work of women in rural areas: the contribution in terms of economics and of labour made by women in agriculture and their role in the economic diversification of rural areas, analysing both cases in relation to the productive and reproductive spheres.

The greatest volume of work is being carried out at the Universidad Autónoma in Barcelona, on the first of these themes: gender relations and the work of women in agriculture (Canoves, García-Ramon and Solsona, 1989; García-Ramon, 1990), with reference to the particular case of Catalonia. Starting from a considerable number of individual contributions (Canoves, 1990; Tulla, 1989) and joint studies (Canoves, García-Ramon and Solsona, 1989) a wider research programme is developing, extending itself into other Spanish regions, using Andalusia, Galicia and Catalonia as models (García-Ramon, ed., 1989); thereby allowing the integration of new study groups from the Universities of Seville and Santiago de Compostela (García-Ramon, Cruz, Salamaña, Valdovinos and Vilario, 1990, 1991a and b), while at the same time individual research is making new contributions to the subject (Salamaña, 1990, 1991).

The results obtained show: a) that there exists large differences in the contribution made by women in agriculture, but their work is largely unrecognised and always undervalued; b) that this contribution is highly important in the case of the small family where, moreover, a large part of the work related to the provision of the family food is performed by the women; c) and what is more, responsibility for the house work and looking after the family continues to fall entirely on them. Undoubtedly, one of the greatest contributions of this research has been to demonstrate the serious problems in collecting information in order

to evaluate the work of women in agriculture. This has led to the development of a methodology based on in depth personal interviews (Baylina, Canoves, García-Ramon and Vilarino, 1991).

The position of women in rural areas is being studied from a wider perspective by a study group at the Universidad Complutense in Madrid. Here, for example, they have undertaken research into differential behaviour in migratory patterns (Alguacil and Bordiu, 1986) and the relations between the lack of mobility of women and access to services in rural areas (Sabate, 1989a, 1989b). The largest project to be undertaken is centred on non-agricultural work of women in rural areas (Sabate, coordinator, 1990): this research illustrates how a large part of light industry located in rural areas in recent years has been attracted by the advantages of a cheap and non-conflictive female workforce; initial results obtained from the Autonomous Community of Madrid confirm this theory (Martín-Caro, 1990; Martín Gil, 1990; Sabate, Martín-Caro, Martín Gil and Rodríguez Moya, 1991). Currently, the research has spread to other regions in the centre of Spain, in parallel with similar processes developed in Italy, Portugal and Mexico.

In addition to these two lines of research, important theoretical contributions are being made (García-Ramon, 1989c) related to the rôle of women in the scientific community (Catañer and Centelles, 1985; García-Ramon et al., 1988) and in methodological techniques (Solsona, 1989).

The rôle of women in urban areas has been the object of a smaller volume of research, but the important contribution made regarding the characteristics of the work of women in the Metropolitan Area of Madrid should not be overlooked (Rodríguez Moya, 1988, 1990, 1991; Díaz Muñoz and Rodríguez Moya, 1989, 1991); nor should the research into the differential mobility of women (Clos, 1986; Díaz Muñoz 1988, 1989). Finally, note should be made of the detailed analysis made by Solsona (1991) of the introduction of women into the Spanish job market.

OTHER ACTIVITIES

One of the most dynamic aspects of the Geography of Gender in Spain is the development of an active network of interchange with other scientific communities, as well as the concern to diffuse and explain the contributions which have been made following this approach. This has meant the inclusion of this theme in basic Geography texts (Ascon et al., 1989), in the Doctoral programmes of the Universidad Autónoma and the Universidad Central in Barcelona, and the organization of intensive courses within the Erasmus Programme, such as those held in 1990 in Amsterdam (M.D. García-Ramón: «Women's Rôle in Spanish Agriculture»; A.F. Tulla: «Women and the Family Farm in Catalonia») and in 1990 in Durham (M.D. García-Ramón: «Gender Divisions of Labour»).

A further aspect which should be highlighted is the collaboration with women's associations, as well as with various organizations which aim to improve the understanding and the conditions of the woman's way of life; collaboration with the «Instituto de la Mujer» has resulted in the organization of various seminars («Agriculture, Gender and Space», Universidad Autónoma in Barcelona, 1987); the joint financing of the 14th volume of *Documents d'Anàlisi Geogràfica* (1989); the subsidising of various research projects (Sabaté et al., 1988, «The

Work of Women in Rural Industry»; Sabaté et al., 1990, «Industrial and Economic Change in the Madrid Periphery: the effects on women»). It should also be pointed out that the Banco de Bilbao-Vizcaya published a monographic issue on «Women and Agriculture» in the journal *El Campo* (Banco de Bilbao-Vizcaya, 1988) in which several geographers contributed (García-Ramon and Canoves, 1988; Majoral, 1988).

In the more practical field, collaboration is taking place in the analysis and promotion of innovative and reactivatory activities carried out by women in the rural areas, especially in mountain areas and economically depressed zones (Sabate, 1991). Participation in numerous workshops with the women involved allows for a greater understanding of the social reality under research, as well as a greater diffusion of ideas amongst these women regarding the possibilities of improving their own living conditions.

To conclude, the Geography of Gender in Spain is in a period of growth. It is worth highlighting the high degree of acceptance by the scientific community as a whole, as evidenced by the study of numerous academic topics, the frequency with which these subjects appear in scientific journals of indisputable quality and by the growing number of young researchers who are now beginning to incorporate this approach in their scientific research.

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6. REVIVAL AND RENEWAL OF POLITICAL GEOGRAPHY

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In the last years, some authors (Bosque Sendra, 1982; Méndez, 1986) have alluded to a Political Geography revival within geographical science as a whole and, up to a point, in Spain. At the same time, it is said that «Political Geography is, at this moment, an unknown and un-cultivated discipline», and it «seems to rise among geographers ... an obvious suspicion in those scholars that desire a neutral science ... and who find in the qualifier Political some dangerous connotations» (Méndez & Molinero, 1984). It is clear, however, that in the last decades of the 19th c. there were a number of relevant theoretical and applied studies in Political Geography (Bosque Maurel, 1989) related to the activities of the Sociedad Geográfica de Madrid (re-named in 1902 Real Sociedad Geográfica). Moreover, in the '40s, there was a certain interest in Geo-Politics and, partially, on Political Geography, an interest that was soon aborted (Bosque Maurel et al., 1989) and has not found a new start until the last decade, as we have said.

BASIC FACTS FOR THE CHANGE

It is known that, at the end of the Civil War, Geography started a stage of development, assertion and growth in Spain. Political Geography and, even more, Geo-Politics gained a certain relevance within geographical studies and, even, outside them. Geography was, however, ruled by the French Vidalian school, a school focused in Regional Studies and not interested on political aspects, which were found to be secondary (Bosque Maurel, 1989 and 1991).

In the development of geographical studies and the professional community, started in 1939, there was an essential quantitative and qualitative change in 1975, a change that in the case of Political Geography was outstanding. There is not doubt that the substantial and significant socio-economic transformation suffered by the nation after General Franco's death and the following Régime change contributed to it (Bosque Maurel, 1991).

Thus, Political Geography returned to the arena in the '70s and has remained in it since 1980 (Méndez, 1986), after the long period of silence started in 1945-48. Geo-Politics, however, has stopped being a working line at least for the Spanish geographers, although not for Historians, the Military and Jurists.

It is obvious that Spain has followed, with some delay, on this revival, the steps of other geographical communities either French (Claval, 1978, Raffestin, 1980, and Sanguin, 1981) or English (Taylor, 1985, and Taylor & Johnston, 1979). Such a delay is, however, inferior to that in general Geography, and reminds us of the early appearance of Political Geography and of Geo-Politics in the '40s.

We have to point out that this revival presents new working lines; a new subject has been added to the traditional 19th c. studies (Bosque Maurel, 1989): the

Spanish political relation with the international political set, and Spain's legal-administrative planning.

AN INCREASING THEORETICAL INTEREST

In the first place, we have to point out an increasing interest for conceptual and methodological aspects; although it has not achieved the relevance it has in other communities, it is of a greater significance. An important author is Joan-Eugeni Sánchez, professor in the University of Barcelona (1985 and 1986), and his work «La geografía y el espacio social del poder» (1981). Working with a Marxist methodology, Sánchez uses the concept of production mode as an analytical tool to validate the hypothesis that there is a correspondence between the mode of production and the social space articulation. Therefore, there are no «casual» facts nor natural conditionings; it is due to the needs of dominant power in each moment and place. Close to these approaches is his recent work on «Espacio y nuevas tecnologías» (Sánchez, 1988) or «Espacio, economía y sociedad» (1991).

Along the same line but not of the same quality, there are some presentations to the Colloquium on «Marxismo y Geografía» (1983) hold by the Universidad Complutense in Madrid, some debates in the Working Sessions organized by the Asociación de Geógrafos Españoles on «La región y la geografía española» (1980), the III Coloquio Ibérico de Geografía de Barcelona (1984) and the VIII Coloquio de Geógrafos Españoles (Barcelona, 1983), and the XI Congreso Nacional de Geografía (Madrid, 1989).

The theoretical interest for power and space has been promoted by the publication in Spain of several foreign authors that, since the end of the seventies, have reaffirmed the interest of the Spanish geographers for Political Geography. We refer to the works by Lacoste (1976), Bertrand (1978), Cohen (1980), Sanguin (1981), Muir (1982) and Rikiel (1984).

They have facilitated the appearance of Spanish works, either on a general level (Bosque Sendra, 1982; Méndez & Molinero, 1984; García Ballesteros & Bosque Sendra, 1985), or on Spain (Nadal, 1982-1983, Méndez, 1986; Bosque Sendra, 1987). In all these works, the informative and normative character prevails over the conceptual and epistemological meditation, however, they have encouraged political-geographic research.

Finally, another subject, closely related to theory, is the study of Political Geography, its past and its stages. There are important papers by Alonso Baquer (1972, 1977 and 1985), Bosque Maurel et al. (1984, 1988 and 1989), Hernández Sandoica (1986), Nadal (1985 and 1987), Sanz García (1985 and 1986) and Velarde Fuertes (1983).

We have to stress that the different historical periods of Political Geography have been unequally studied. Thus, researchers have studied mainly the turning point of the 19th. c. to the 20th c., but they are overlooking the period prior to 1939, when there was a group of relevant scholars, as well as the present time, noteworthy for its future consequences.

EMPIRICAL STUDIES

Together with theoretical studies there are also many empirical analysis.

A new subject, at least among geographers and not so much among historians and sociologists, is Electoral Geography; of the three fields mentioned by Taylor & Johnston (1979), only two of them are studied in Spain. The following authors have analyzed Vote Geography, the most studied theme: Bosque Sendra (1983), Compán Vázquez (1982), García Ballesteros & Bosque Sendra (1987), Ruiz de Olabuenaga (1980 and 1982), and Vidal Bendito et al. (1983).

On the other hand, studies on the more geographical aspect of spatial influences are fewer: Bosque Sendra (1981 and 1983). Political representation has not been studied up until now. Bosque Sendra's (1988) book on Electoral Geography in Spain attempts to summarize the current situation.

There is, besides, a revival of a subject very significant among the geographers before the Civil War. We refer to the debated question of land political-administrative planning and its problems and changes. This working line was started by the Real Sociedad Geográfica and Lucas Mallada at the end of the 19th c. (Nadal, 1986) and by Prof. Melón from 1920-1960 (López Gómez, 1977), and currently there is a group of scholars that link tradition and novelty.

Among general studies we can mention: Arroyo's (1989), Bielza de Ory's (1976), Capel & Clusa's (1985), Casassas' (1984), López Trigal's (1978, 1981, 1984, 1985 and 1989), Nogué's (1989), Puyol Antolín's (1981) and Serrano Martínez's (1985). The Real Sociedad Geográfica has made a similar though applied work preparing the statutory reports on changes of capital and borders of Spanish municipalities.

Much more relevant has been the direct and indirect participation of geographers in conceptualization and organization of space. We have to note the already-mentioned Working Sessions on «La región y la geografía española», held by the Asociación de Geógrafos Españoles in 1979, published in 1980, the Sessions held by the Societat Catalana de Geografia on «Regionalización del territorio» in Barcelona in 1989, and the Sessions held by the Universidad Menéndez y Pelayo and by the Colegio Universitario de Gerona in Gerona in 1989.

Many geographers from Spain as well as important foreign personalities attended all of them. We have to mention also their collaboration in land planning reform projects of different Spanish Autonomic Communities, such as in Cataluña, whose project was to actualize Pau Vila's land planning (1933), or in Andalucía, when they decided on a new county division (1980).

In this sense the most relevant studies are: in Cataluña, by C. Carreras et al. (1979), Casassas (1977, 1984, 1985 and 1989), Casassas & Clusa (1981), E. Lluch & O. Nello (1983) and Universitat Autònoma de Barcelona (1983). In Andalucía, J. Clusa (1983) directed a debated institutional project; other studies are by Compán Vázquez (1983), López Ontiveros (1984 and 1985), Pezzi (1982) and Sáenz Lorite (1980 and 1985). There are references to other Communities; for Galicia, Chantada & Pérez Fariña (1984), Chantada & Hernández Borge (1985), Miralbés Bedera et al. (1985), and Urcola et al. (1985). For Castilla-La Mancha, see the proceedings (1986) of the I Reunión de Estudios Regionales de Castilla-La Mancha, held on may 1984.

A recent subject, although related to the 19th c. tradition, is the analysis of border problems or of the new strategic, maritime and air spaces, either as products or as land. Significant studies are those presented to the Coloquios Ibéricos held in Salamanca (1979) and Oporto (1987), to the VIII Coloquio de Geógrafos de Barcelona (1983) and to the Congreso Mundial Vasco (1988).

We have to stress the relevance of J.L. Suárez de Vivero, working on maritime space (1979, 1983 and 1987), Urteaga (1988) and Antón Burgos (1989), Cano (1980 and 1984), and Córdoba on air space (1981). Less important are the papers on borders, bordering space and regions and its present and past problems: Bosque Maurel (1968), Compán Vázquez (1983 and 1984), García Martín (1984), López Trigal (1984) and Suárez Japón (1989).

CONCLUSION

In any case, the present and past evolution of Political Geography agrees with the development of our discipline in Spain. It is a working line still in its beginnings, but it has to open its horizons, if we want Spanish Geography to equally compare with other world schools.

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7. QUANTITATIVE GEOGRAPHY IN SPAIN

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INTRODUCTION

The purpose of this paper is to evaluate Spanish Quantitative Geography literature produced in the last decade. In 1983, there was a similar work (Bosque Sendra, J., Rodríguez Rodríguez, V. & Santos Preciado, J.M., 1983) so this new analysis is a prolongation and enlargement of the ideas expressed in that paper. We have carried out a review and analysis of most Spanish Geographical Journals and Proceedings Books of the main Geography Congresses and Meetings held between 1982 and 1990. We have found 381 articles or congress papers where quantitative methods and techniques are more or less used. To obtain a better analysis and description of the results, we have classified the works according to the quantitative technique used and according to the geographic branch its theme may be assigned to.

In the last years, the total number of quantitative works has increased, going from 30-40 yearly publications to 40-50 (figure 1). This evolution shows the existence of two groups of geographers: one of these groups has been employing in a steady manner quantitative methods for years while the other growing group makes a casual use of these techniques in their researches.

The quantitative works' subjects are various, as we can see in Table 1. We can find papers on Human Geography, Physical Geography or, even, on Regional Analysis that make use of some quantitative technique. However, it is Human Geography where the highest number (57.5 %) appear, followed by Physical Geography (39.1 %). In sub-branches, it is in Climatology where geographers have applied quantitative techniques the most, followed by Urban Geography and by Population Geography. We have to point out, however, the high level and number of papers devoted to Transportation Geography, a less developed area of study in our country, that gets 6 % of all the quantitative publications.

According to the techniques used, classical descriptive (univariate mainly) statistics prevail. More than half of all the papers analyzed employ this analytical method. It is followed by some mathematical models: spatial interaction, simulation, etc. Spatial analysis is not used much in Spain; only 6 % of the papers use it, and most of them employ the graphs theory in relation to transportation themes. Lastly, concrete computer treatments, not just applying a software program, play a secondary role in Spain's Quantitative Geography.

Concept, history and methodology of quantitative techniques in Geography appear in a special section. They amount to 9.7 % of all the publications for the period studied. They can be divided into two groups; Concepts and History of Quantitative

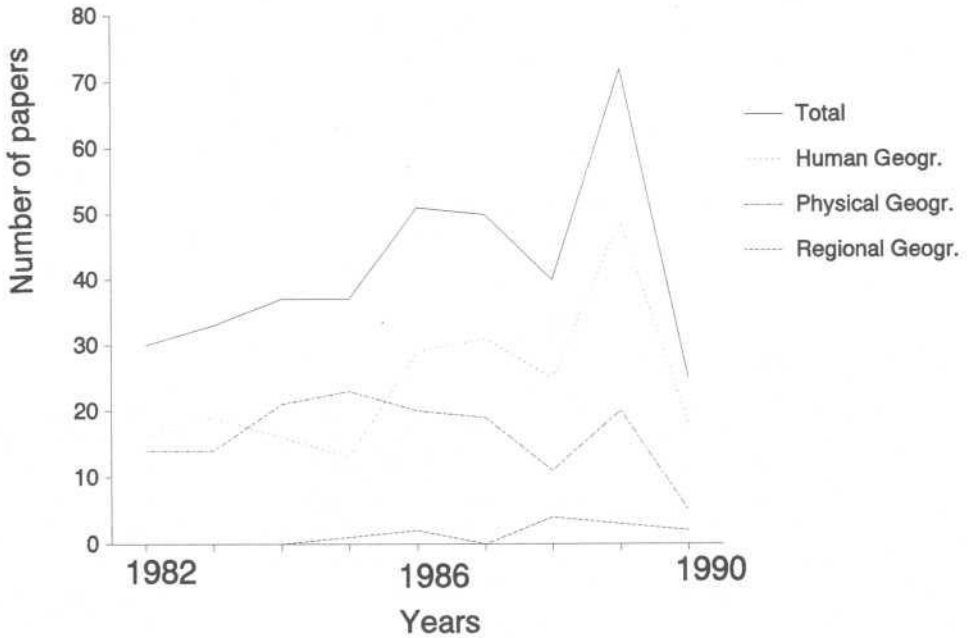


Fig. 1

Geography, either in Spain and abroad, is one of the groups; the other refers to general methods, such as how to measure geographical facts, or Classical Statistics' criticism and new alternatives in Human Geography, or how to define a geographical object and the scale of analysis. There are also some works that study the basic elements in central places' theory, arriving to a new interpretation.

STATISTICAL GEOGRAPHICAL PRODUCTION

As we have already said, there is an almost predominance of statistical and data analysis techniques (over 75 % of the total) in relation to other quantitative methods: models or methodological, conceptual and epistemologic theoretical works.

Save some exceptions (that follow the exploration data analysis, E.D.A), most statistical contributions are included in the field of classical statistics. Therefore, traditional statistical analysis is the tool applied normally to the treatment of geographical information.

To make easier the analysis, carried out from the scientific method's inductive perspective, we have differentiated three fields. Two of them derive from the descriptive and inferential arms of statistics; to them we add the study and analysis of spatial or geographical distributions. Most papers appear in the field of descriptive statistics (understood to be census data gathered extensively), with a few in the field of inferential or spatial statistics (Table 2).

In the field of descriptive statistics, the publications just fulfill the tasks of observing and describing, and only reach the explaining stage within a slightly formalized historicist context. Most of them are very basic, that is, they study the distribution of one variable by using parameters of position and dispersion as

Table 1. Distribution of quantitative publications, according to geographic branch and technique used.

BRANCH	TECHNIQUES																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Not classified	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Population G.	6	12	11	11	0	1	1	0	0	0	0	4	3	0	0	1	1	51
Urban G.	3	13	10	21	1	2	1	2	1	1	0	1	3	1	7	0	0	67
Agrarian G.	0	7	7	11	1	0	0	0	1	0	0	0	1	0	1	0	0	29
Industrial G.	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
Other Serv. G.	0	0	5	1	0	0	0	0	0	0	0	0	0	2	4	3	0	15
Perception G.	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Vote Geography	0	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	5
Political G.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	2
Economic G.	1	0	1	0	0	0	0	1	0	0	0	1	0	0	0	0	0	4
Transport. G.	3	1	1	2	0	0	0	11	1	0	0	3	0	1	0	0	0	23
Social G.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Medical G.	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2
Other Hum. G.	8	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	11
Geomorphology	2	18	9	2	1	1	1	0	1	0	1	0	0	0	0	1	0	37
Climatology	0	21	17	6	14	2	0	0	0	0	1	0	5	0	0	2	0	68
Biogeography	1	1	2	5	0	0	0	0	0	0	0	0	0	0	0	0	0	9
Hydrology	1	17	4	4	0	0	0	0	1	0	0	0	1	0	0	0	0	28
Other Phys. G.	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	7
Regional G.4	0	1	4	0	0	0	0	0	0	0	1	0	0	1	1	0	12	
Total	37	97	74	70	17	6	3	14	5	1	2	12	13	5	14	8	2	380

Techniques: 1, Concepts 2, Univariate Stat. 3, Regression Statistics 4, Multivariate Statistics 5, Inferential Statistics 6, Other Statistics 7, Point Spatial Analysis 8, Networks Analysis 9, Spatial Auto-correlation 10, Interpolation 11, Other Spatial Analysis 12, Spatial Interaction Models 13, Simulation 14, Optimization Models 15, Location Models 16, Computer Sc. 17, Other Techniques 18, Total

well as some elemental ratios that concentrate the information on one indicator, such as relative location, centrality, function specialization, etc.; they synthesize the information and reflect a simplified reality.

Bivariate correlation and regression analysis is used as a geographical explanation. The study of the quantitative relation of two variables is applied in a number of research works, to measure the association level of geographical phenomena. Lastly, in multivariate analysis, the most applied methods are factorial techniques (factorial and principal components analysis), multiple regression analysis, cluster analysis, correspondence analysis, and discriminant analysis.

In the field of inferential statistics, the contributions have been fewer. They usually try to test hypothesis, to compare a real distribution with a theoretical assumption; they do not infer population features from population samples.

There is a high disproportion between the works that apply statistical techniques to geographical data and the works that take into account spatial structure. Most of the papers published in the area of Spatial Statistics apply, basically, the analysis of graphs and networks, of the nearest neighbour, shape definition, etc.

Table 2. Distribution of Statistical Quantitative Works, according to Statistical Methods.

Descriptive Statistics	85,5%
• Univariate analysis	35,6%
• Regression analysis	25,6%
• Multivariate analysis	24,2%
- Factorial analysis	11,2%
- Multiple regression analysis	5,3%
- Cluster analysis	4,0%
- Correspondence analysis	1,3%
- Discriminant analysis	1,3%
- Others	1,1%
Inferential Statistics	5,9%
Spatial Statistics	8,6%
• Networks & Graphes analysis	8%
• Nearest neighbour analysis	1,0%
• Shapes analysis	1,8%
• Others	1,0%
Total	100%

MODELLING: AN EMBRYONIC BUT PROMISING STATE

If modelling means using some complex mathematical tools when developing theories, we can say that both (theory and modelling) appear very little in Spanish Geography. Only 13.6 % of the researches include some kind of mathematical model; that is, there is an average of six titles per year. Besides, the distribution among the different geographical areas is unequal: only six works are about Physical Geography (of which, 5 are on Climatology), and one is about Regional Geography. The highest percentage is about Human Geography; there are 37 publications (84 % of all similar papers) on subjects such as urban, demographic, transportation and services.

We have to point out that these publications come, basically, from very few university centres. Madrid and Barcelona, jointly, have produced more than half (52.3 %); other secondary points are: Granada, Palma de Mallorca, Zaragoza, Santiago, etc.

A well-defined group of papers has approached questions related to *location* of settlements and their relation to central places theory. Among them, there are very different papers: from those that develop theoretical conceptions to those that make use of simple techniques to measure the settlements's centrality or hierarchy, or of some services such as banks (for instance, the rank-size rule).

Much attention has also been paid to questions of *spatial interaction*. Transportation Geography has adopted gravitational models to analyze railways, air flows and intra-urban trips. The level of spatial integration at urban or regional scale has been studied by a wide range of tools: gravitational models, transactional analysis, multivariate techniques and links and graphes analysis. A few

studies assess accessibility through indexes, carry out population maps according to potential models or study retail trade with Huff's model.

Simulation models are used in heterogeneous areas: when carrying out population projections, when describing climate sequences through Markov's chains, when assessing aeolian energy or hydrogeological processes. This is, almost, the only model applied to Physical Geography. They have been also used, in some isolated studies, in dynamic modelling of urban activities (offices) or in delimiting spatial diffusion processes, such as the increase in party affiliation with the arrival of democracy or cattle activities, to assess their impact.

Optimization techniques have found very little attention among Spanish geographers for two reasons: their higher complexity and the little diffusion of solving software. There are only five recent publications that, moreover, are thematically concentrated; four of them deal on services. In two cases, they apply location-allocation as well as multiple decision models to define plans of educative equipment supply at a sub-regional scale, and to establish a new hospital distribution in a metropolis. In the transportation field, these models help to set new acting policies on street systems, and in a research a lineal programming was applied to identify optimum schemes of urban land usages.

Beside these studies, there are some other isolated and relevant works due to their current importance. We have to mention digital elevation models, within Geographical Information Systems.

A SMALL PRODUCTION OF SOFTWARE FOR QUANTITATIVE ANALYSIS

Spain's geographical contribution is little in this field. Just eight publications present software programs to be applied to quantitative methods; it is clear, however, that many researches had required the development of *ad hoc* programs. We have to point out three products: a geographical information system called SEPOT that includes spatial analysis modules; a set of optimization programs compatible with SIG IDRISI, and the demographic projections program DEMOS.

THE GROUP OF QUANTITATIVE METHODS (G.Q.M.)

The application of quantitative methods to Spanish Geography is a clear evidence of the renewal process in geographical thought and of the acceptance of new methods and tools. Another evidence is the training and creation of a group of geographers linked by their interest on this scientific methodology.

This process started at the end of the seventies, when there appeared activities devoted to the application of statistical and computer techniques to Geography. Thus, geographers in Madrid and Barcelona received some training courses on ideas and experiences arriving to the university. From 1983, when the I Coloquio de Geografía Cuantitativa was hold, said process enlarged its activities among Spanish geographers and its new generations, until nowadays, when the IV Coloquio has been hold. Due to all this activity, there have been four publications that collect the contributions presented to the Coloquios (see Bibliography).

The G.Q.M. has achieved a clear importance within Spanish Geography as it is shown by the four Coloquios, by several courses in quantitative methods and techniques in Geography, and by the ten issues of its Boletín Informativo. Nowadays, the Group is in the Asociación de Geógrafos Españoles (A.G.E.) (Association of Spanish Geographers), where other similar groups, specialized in other geographical areas, have been born. The G.Q.M.'s working activity is two fold: to diffuse quantitative and computer techniques, and to apply these techniques to university teaching.

Quantitative diffusion has found many drawbacks and difficulties. The Spanish geographer's traditional historicist training, as opposed to employing formalized languages, meant a serious handicap to the general admission of other working ways. Nowadays, the introduction of computer technologies and the diffusion of quantitative methods thanks to international geographic literature within Social Sciences, and within Geography, play an important role in the opening process. Geographical research is more interdisciplinary; the Spanish geographers' relations with other foreign colleagues are enlarging due to the collaboration in projects and to the assistance to international congresses. These activities are actually carried out by the Spanish quantitative geographers. The clearest evidence is the relevance achieved by Geographical Information Systems. Since the III Coloquio de Geografía Cuantitativa, the GISs are part in the geographical talk, and their interest derives not only from its novelty, but also from its relevance in geographical analysis.

The second field for G.Q.M. activities is teaching. Since 1983, in the I Coloquio, it was clear that a reason for the little development of quantitative methods among Spanish geographers was their little mathematical training. In fact, geographical curricula were devoted to a literary Geography; therefore, the inclusion of instrumental courses has risen problems for students, professors and institutions.

In 1990, at the IV Coloquio, the G.Q.M. presented a report on quantitative methods in future university Geography curricula, in order to express the quantitative geographers' opinion in reference to changes in curricula. From empirically checking (through a survey) such a need, the group believe that quantitative methods must be part of a geographer's equipment, either as teacher, professional or researcher. To achieve this aim, they suggest creating the appropriate conditions so geographers accede to mathematically-formalized concepts and analysis, to introduce all these knowledges in several areas of geographical analysis, and to teach the instrumental courses of most future importance in Geography.

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P.S. - Grupo de Métodos Cuantitativos (G.M.P.) = Group of Quantitative Methods (G.Q.M.).

8. STUDIES IN ENVIRONMENTAL PERCEPTION IN SPANISH GEOGRAPHY

J.G. ESTÉBANEZ

INTRODUCTION

In Spain, Social Studies (and Geography especially) were not an important scientific subject in the early 20th c.; this situation worsened after the Civil War and in the '40s and '50s, when the lack of freedom and the repressive political atmosphere that had removed relevant Geographers from the University produced an intellectual atmosphere close to any reflection and to new scientific trends.

In the '60s and '70s, economic liberalism plus the Academy's outstanding growth meant a clear increase in Geography's scientific community; said quantitative increase, however, did not include a development in Geographic knowledge. In fact, Geography was considered as History's ancillary subject. Save in Zaragoza (since 1957), there was no speciality in Geography in the University. Besides, Geographic community was monolithic and under the intellectual control of three influential masters, so it did not favour debating nor innovations.

Geography followed the French model, and the masters thought it to be a singular and exceptional science with very few contacts with other social studies. It was a synthetic science, a point of view whose main purpose was to carry out local studies, as starting point of the researcher, and to end in a region's thorough and tiresome monography (Melón, 1944; Casas, 1965, 1974; Terán, 1957). Reflection and innovations ought to be left for the masters or be approached when intellectually mature.

This opinion on Geography's leaders part did not favour either opening up nor new approaches, and explains together with the discipline status the late introduction of scientific innovations.

In the '70s there was a certain interest on other Geographical ways, although it found a strong opposition. The new Geographic trends in Spain are due, therefore, to the outstanding growth of the community that leads many geographers to get in touch with the Anglo-Saxon community and to introduce those experiences in the country.

PAPERS ON GEOGRAPHY OF PERCEPTION

There are two kinds of contributions in scientific production. First of all, we have to point out the late introduction of this approach as well as the clear imbalance between review works and factual research.

Review Works

Among review works we have to mention an article by H. Capel (1973) on «Percepción del medio y comportamiento geográfico». He carries out a synthesis of main theoretical contributions and of most relevant contributions in different

Geographical fields: relief, perception and urban landscape representation, spatial choices, the region, sense of belonging, etc. This work offers a general view based on a wide and selective bibliography. In this same reviewing and informing line there is a work by Martínez de Pisón (1978) on «El paisaje interior». He attempts to link the perception and behavioural approaches with traditional geographers such as Hardy, Helpach and Sorre. In my opinion, he mistakes those authors' intention for the actual research, where the study of subjective elements and the environmental own position are expressed.

Lastly, Bosque Maurel (1979) actualizes the origin, development and main contributions in Perception and Behavioural Geography in the opening lecture at the Real Sociedad Geográfica.

In short, these three contributions were important to introduce and propagate this approach; they opened the way for empirical studies by Geographers, although there were also other contributions by Anthropologists and Environmental Psychologists.

Factual Research

In the '80s, there appeared many empirical works, most of them on cognitive maps, that made use of different analytical techniques. Among them we may point out the usage of mental maps in land management, as well as the role played by stereotypes, prejudices and myths in mental maps making in different Spanish regions (Estébanez, 1979), or mental maps making using spatial preferences applying factorial and trend surface techniques (Estébanez, 1981).

From a theoretical, methodological and instrumental point of view, we have to point out Castro Aguirre's contribution (1980) and those by the environmental psychologist Aragonés (1983, 1984). It is also noteworthy the work on TV influence on Andalucía's socio-spatial structure by the geographer D. Compán (1978).

Recently, there have been shy discussions on the relevance of neo-positive cognitive maps, and there have been approaches to considering territory as something else than a mapping question. Thus, Anthropologist J.L. García (1976) defines territory as «a socialized and culturalized space such that its socio-cultural meaning affects the semantic field of scientific specialities». He analyzes infra-structural conditions from which spatial socialization and culturalization act.

J. Nogué (1985) presents the most coherent neo-positive contribution. From a phenomenological approach, he questions Geography's contributions to landscape; he stresses the new phenomenological ways to read the traditional landscape of a Catalanian area (La Garrotxa) using literature and photography. In my opinion, however, his biggest contribution is the attempt to discover said area's existential landscape through «experimental field work». He selects five environmental experience groups: vacationists, hikers, landscape painters, neo-rural and peasants. After interviewing them in depth in different periods of the year and severally, he arrives to relevant conclusions on the existential landscape of these five groups.

Following this same line, although somewhat more eclectically, J. Estébanez (1988) studies the pertinence of cognitive maps on the knowledge of environ-

mental relations. He starts from Eyles' idea and method (1985) on senses of place, which he applies to suburban residential space in Madrid's metropolitan area.

Recently, environmental geographers and psychologists have contributed to the field of cognitive maps in urban areas; they follow Lynch's scheme. Among these works, there are some on Madrid (Aragónés, 1984, 1985), Santiago de Compostela (De Vega et al., 1983), Lérida (Vilagrassa et al., 1982), Segovia (García Ballesteros and Bosque Sendra, 1987), and Barcelona (Javaloy, 1988).

In general, empirical researches on Perceptual Geography lack all theoretical framework, which come from environmental psychologists. See works by Lázaro (1985), Martín (1985) and Aragónés and Arredonde (1985).

In short, Geography of Perception studies appear late in Spain due to unfavourable conditions in the scientific community. At first, in the '70s, the studies are just informative, and they turn into factual researches in the '80s. Lastly, nowadays, the researchers have started debating the appropriateness of neopositivist methods for understanding spatial relations, and there are also alternatives inspired by humanistic trends.

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9. GEOGRAPHY AND LITERATURE

N. ORTEGA-CANTERO

During the last twenty years, various studies have been carried out in Spanish Universities investigating the geographic value of images of the landscape and images of space in literature. These studies have largely, though not entirely, concentrated on images of Spain; examining both those images which offer an insight into the country's natural features as well as those related to the human environment, be it rural or urban. The most frequently used literary sources have been those written between the 18th century and the present day. More specifically, within this period, those representations and ways of interpreting the landscape and space which have generated the most interest have come successively from the Enlightenment, the Romanticism, the «Regeneracionismo», the Generation of '98 and, finally, the novel movement after the Civil War of 1936-1939. Although other forms of literary expression have also been examined, the research made so far indicates that a considerable amount of attention has been given to the perceptions and the images contained within travel writing.

The studies related to travel writing have followed various major lines of research. Some have set out to clarify the geographic significance of the various traditions, by attempting to define the learning, thinking, attitudes and experiences of the travellers on which their images of the landscape and space are based. Within this framework a number of studies have been undertaken examining different forms and different times within the literature of travel writing. The study of travel books within the naturalist tradition has resulted in a classification of their most significant features according to cycles - the Polar, the Alpine, the Pyrenean, the Asiatic, the Volcanic and that of the Cave - which possess various cultural, symbolic and geographic characteristics, while those works related to the Canarian volcano, the Teide, have been treated separately (Martínez de Pisón, 1984a and 1984c). Both the motives and the imaginary and real horizons of the journeys described by the Enlightened travellers of the 18th century have been examined in relation to the geographic understanding of the time (Capel, 1985); while the travelling tradition of the Romanticism has been examined in studies which have tried to define the most relevant aspects of a geographic perspective and to evaluate the meaning of the literary images of the natural, urban and rural landscape in Spain: the studies have been done regionally, above all, in Andalusia, (López Ontiveros, 1988) and extended to examine Spain as a whole (Ortega Cantero, 1990). In addition, the mountain literature of the 19th century which describes Switzerland and Catalonia has come under consideration (Martí Henneberg, 1990) and the Romantic literary images of Corsica and the Balearics and their influence on respective tourist values have been examined (Seguí Llinás, 1991).

Other travelling traditions have also been the object of research. The relation between modern geography and the travelling and rambling tradition, captured in

various literary descriptions, of the educational and intellectual «Regeneracionismo» which gave rise to the «Institución Libre de Enseñanza», between 1876 and 1936 in Spain have been investigated (Ortega Cantero, 1984 and 1988). The background to and the pedagogic aims of this Spanish travelling and rambling tradition within the «Institución Libre de Enseñanza» have also been studied (Martínez de Pisón, 1984b). The geographic and cultural depiction of the landscape of Madrid and Castile has been examined (Ortega Cantero, 1986a), as well as the significance of these images, and their corresponding perceptions, in the development of a modern naturalist interpretation of the Sierra de Guadarrama and of the latter's educational and tourist values (Mollá Ruiz-Gómez, 1989). The geographic qualities of the travel literature of the Spanish writers of the Generation of '98 have similarly been studied, and the characteristic features of the visions of the landscape which they offer in each case have been highlighted (Zulueta Artaloytia, 1988).

In addition to the above, there have been studies undertaken which examine and compare the different representations in travel literature of the same place. This approach has been used with the city of Madrid, helping to distinguish the features of the images of the city successively described by foreign travellers in the 16th and 17th centuries, from the Enlightenment upto the Romantic era (Brandis, 1988). Similarly, the city of Córdoba has been studied by comparing the literary descriptions of the Enlightened and Romantic travellers. The theoretical and methodological basis of this study has resulted in conclusions - based on the criteria proposed by Kevin Lynch in *The Image of the City* - regarding the geographic value, experience, and perceptive and symbolic quality of the urban image presented in this travel literature (López Ontiveros, 1990). In extending this line of research, the same author has published a wider study of the city and the province of Cordoba, using a careful selection of texts and illustrations. The study opens with a chapter dedicated to the relation between Geography and travel literature, followed by a consideration of the contribution of the travellers of the 18th and 19th centuries, and concludes by examining the image of Cordoba in the novel written by Pío Baroja entitled *La feria de los discretos* (López Ontiveros, 1991).

Finally, there have been further reflections on the images of landscape and space in travel literature which have focused more specifically on certain works or certain authors. A case in point are the studies of the *Diario de los viajes hechos en Cataluña*, a travel journal kept by the enlightened Francisco de Zamora, between 1785 and 1790, which highlight the geographic interest of his observations (Llobet, 1970). The studies map out and describe the routes taken by the traveller and record his observations of the agriculture, manufacturing, and natural resource use in Catalonia at the end of the 18th century (Font and Llobet, 1989). Various works of Romantic literature have also been studied, such as the *Oberman* by Senancour (Martínez de Pisón, 1985), as well as those travel books about Spain written by Edward Hawke Locker, Victor Hugo, Gustavo Adolfo Becquer and Enrique Gil y Carrasco (Ortega Cantero, 1985a, 1985b, 1985c, and 1986b). Here, we should also include *La España inexplorada* a study carried out by Abel Chapman and Walter J. Buck and first published in 1910 (López Ontiveros, 1989); and similarly, the study aimed at revealing the perception and depiction of the geographic reality found in the travel narratives of Camilo José Cela (Barceló Pons, 1980).

Although not as numerous as the studies made in travel literature, there has been no shortage of studies made in other literary forms. Some general reflections on the geographic value of literature (Nogué i Font, 1983), on the relation between the urban landscape and the novel (Carreras i Verdguer, 1988), and on the dimensions of landscape, space and land within the novel (Vilagrassa i Ibarz, 1988) have been made. Individual narrative works have been examined in an attempt to interpret the content and the meaning of their images of landscape and space. This has been the case of a work by Azorín which describes the mountain landscape of the Spanish East (Martínez de Pisón, 1973), and of one of Juan Marsé's novels *Últimas tardes con Teresa*—set in the Barcelona of the 50s (Díaz de Castro and Quintana Peñuela, 1978), and of the short stories in *The Dubliners* by James Joyce (Alonso Cantorné, 1988). Studies have also been made of several works written by the same author, aimed at examining the nature and significance of the author's geographic images: such studies have been made of the novels of Marsé and his depiction of the urban reality of Barcelona (Carreras i Verdguer, 1985), and, somewhat distinctly, with the travel adventures of Jules Verne (Sunyer i Martín, 1989).

In certain cases, the studies made of literary representations of landscape and space have referred to actual regions and their «comarcas». The use of different literary sources has added to an understanding of the characterization and meaning of the varied nature of the traditional landscape of the Catalan «comarca» of Garrotxa (Nogué i Font, 1985). And the study of successive literary images of Castile has meant, through comparison with the contribution of the so-called scholarly tradition, that the geographic significance of some of these images—above all, but not exclusively, of those described by the Generation of '98—, reveals a perceptive understanding of the regional concept and the major aspects of its ecological organization (García Fernández, 1985).

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10. HISTORICAL GEOGRAPHY IN SPAIN

F. ARROYO
C. CAMARERO

At the beginning of the '70s, Darby's known asseveration about the two pillars that supported Geography: Geomorphology and Historical Geography (Johnston, 1987) could still be applied to Spain. In fact, whether due to academic training, to professional intention, or to epistemologic concepts, Geographers still were as a Historian that worked in the field and analyzed relief forms, environment features and their impact over past and actual human society.

From a theoretical point of view, it meant, and still means, a conception of world, environment and society that agrees with that of the *Anales'* French School. This school came to Spanish Geography through two ways: the Historians, in the seventies the Spanish Historiography was influenced by Bloch, Febvre or Braudel, and Vidalian regionalism, the clearest geographic course in Spain.

From an empirical point of view, it means a formal and similar structure (that is repeated some times) in most Regional Geography papers of the seventies. They studied the background, landscape evolution, genetic accuracy, etc., as well as the physical characters: geomorphology, climate, land and vegetation. Within this general scheme, some papers developed accurately the «historic introduction» that, some times, turned into the true core of the paper. Quotations are many in this sense. However, and from this point of view, other papers overlooked regional formalism in order to carry out geographical re-constructions per se; their purpose was not explaining present landscape but re-constructing past geographical landscape, or some component. All these works reproduce in their methodological basis the different opinions on Historical Geography; for Baker, it is «the re-construction of geographical conditions of past times», and for Gilbert it is «the re-construction of past Regional Geography» (Bosque, 1983), while Pierre Vilar confessed that he arrived to History delving in the background for a Regional Geography thesis on Catalonia, as he explains in his prologue to his work *Cataluña en la España Moderna*.

The fact that Geography and History were linked formally in Regional Analysis did not imply the existence of a theoretically created Historical Geography. When the so-called «quantitative revolution» questioned the stability of classical Geography and broke regional scheme's unity, the geographer had to choose between «new» Geography and History, which from now on will be considered as totally incompatible.

The situation caused in Spain, as in other countries, different stands still difficult to define; on one hand, some people re-affirmed themselves on historic research and turned to the Records quietly looking for a solution to their epistemologic and identity un-solved doubts. They work and exploit certain resources of outstanding geo-historic documental wealth. Other people, spurred by the new and modern controversy, attempted to overcome their heuristic empirism and applied modern analytical and perceptive methods to re-constructing past spaces. Lastly,

there are also people that, from the most sharp criticism to regional historicism, have ended producing noteworthy works on Historical Geography. Nowadays, it seems as if Historical Geography is coming back; we should not forget that historic perspective fits well both the radical discourse and the objects and methods of Social, Perception or Humanistic Geography.

In the last twenty years, Spanish Historical Geography presents six main working areas:

1) A good number of Regional Geography papers with noteworthy Historical Geography chapters. On an evolutive process, the authors make «cuts» on the most representative periods or when a valuable geo-historic source allows a deeper understanding. Thus, these studies refer to aspects such as population and habitat, agrarian landscape, urban evolution, handicraft and service activities, etc. Cuts usually are about the Crown of Castille and make use, for the 16th c., of the information on *Relaciones Topográficas de Felipe II*, and for the 18th c., *Catastro de Ensenada*. For the 19th c. and for all the nation, documents come from the Church dispossession process and the *Amillaramientos* are the links with the statistical period. References are many (Morales, 1972; López Ontiveros, 1973; Cano, 1974; Ortega Valcárcel, 1974; Calvo, 1975, etc.)

2) The most relevant contributions in Historical Geography start from the forementioned papers. They refer to a theme in concrete, make a critical and geographical use of different historic sources. We have to point out the geographers' contribution to studies on the origin and evolution of land property patterns (López Ontiveros, 1978; Cruz Villalón, 1980; Ferrer, 1982; Domingo, 1983; Romero, 1983; Mata, 1987). The two first Colloquies on Rural Geography (Alicante, 1981, La Rábida, 1983) saw some important contributions on this subject; other significant contributions are made by Gil Olcina (1979 and 1988) and his research team. There are also several monographies on certain rural aspects; they refer to crops, such as the introduction of corn or the withdrawal of sugar cane (López Gómez, 1972 and 1974), to vines and phylloxera, to the evolution of certain agrarian landscapes (Martín, 1975), or to some typical exploitations (Cabo, 1978).

It is noteworthy the usage geographers have made of certain geo-historic sources. The *Catastro de Ensenada* has allowed not only studying land property patterns in the middle of the 18th c. as background for its posterior evolution but also reconstructing that century's rural and urban society. Geographers have studied aspects as different as the population structure, habitat, crops distribution and agrarian exploitations, livestock, farming production prices, forests, fishing, handicrafts, «industrial» and commercial activities, private and council debts, etc. (Cabo, 1979; Ferrer, 1975; Camarero, 1986, 1989, 1990; etc.). There are other recent studies using the information contained in *Relaciones Topográficas de Felipe II*; this work, together with Esquivel's map and Wingaerde's prints, is that Judicious King's geographic legacy, which could not be ignored by Spanish Historical Geography (López Gómez, 1989; Arroyo, 1990; Roselló et al., 1990; etc.).

3) Studying the evolution or re-construction of rural environment leads to the analysis of un-agrarian elements. Such is the case of hydraulic resources and their exploitation in papers on irrigation origin and evolution by López Gómez (1971, 1974, 1975), Gil Olcina (1972), Bielza (1975) or Alberola (1984); or the case of

river navigation projects (Arroyo-Camarero, 1989), of mills (Roselló Verger, 1989), of saltworks (López Gómez-Arroyo, 1983), etc.

4) Historical Geography studies on population mix up with studies on Historic Demography, since methods and objects are basically the same. We have to mention the comprehensive exploitation of some pre-statistics sources, such as «pecheros», maravedí, «fogatges» counts (all of which are fiscal census), or mainly, Floridablanca's census, a direct antecedent of modern census (Vidal, 1984). Geographers have carried out either sequential cuts on some periods (Bielza, 1975; Iglesias, 1981; Arroyo, 1979 and 1986), or have analyzed the populations' global evolution from that moment to nowadays (Quirós, 1971; Pérez Puchal, 1972; González, 1975; Martín, 1978). Basically geographic are the studies on population's historic evolution (Arroyo, 1979) and those that attempt to analyze several related elements, not only quantitative elements (López Ontiveros, 1981). We have to mention also as interesting for Historical Geography, articles on death rate and natural movements (Pérez Puchal, 1972; Troitiño, 1982) using parish files, or papers on migrant movements, due to repulsion (Villegas, 1974) or to re-population (Costa, 1978). Lastly, we have to mention studies on different models of demographic transition and interest on methodological problems (Pérez Puchal, 1972).

5) The city presents the same process than the region: any urban center's traditional analysis must study its historic evolution. Most Urban Geography thesis are notable compendium of that city's Historical Geography (Teixidor, 1976; Troitiño, 1984; etc.). As with regional analysis, this tendency turns into concrete geo-historic studies (Capel, 1975; Brandis, 1979; etc.).

6) In this section, we would like to mention those studies on social perception of some geographic and environmental aspects in different historic moments (Urteaga, 1984, 1987) or on the paper played by the State or by certain social groups in relation to geographic aspects such as mapping (Capel et al., 1983; Capel-Sánchez-Moncada, 1988; Nadal-Urteaga, 1990, etc.).

Finally, we would like to point out a significant fact for the future: the edition of some important historical sources such as *Las Relaciones Topográficas de Felipe II*, for Madrid and Castilla-La Mancha, the so-called *Censo de Tomás González*, *La Planimetría General de Madrid*, *Las Respuestas Generales del Catastro de Ensenada* for the biggest populations and cities of the Crown of Castilla (at this moment, 30 places are already published), *Vecindario de Ensenada*, *Censo de Floridablanca*, *Vistas de ciudades españolas de Alfred Guesdon* and *Planos de las ciudades españolas de Francisco Coello*, *Diccionario de Madoz*, etc. In all these projects, some of them still unfinished, have collaborated geographers together with scientists of other Social Studies, such as Historians, Financial Experts or Economists.

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11. LANDSCAPES STUDIES IN SPAIN: A REVIEW

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It was in the second half of the 19th century and the first half of the 20th that a large part of the theoretical foundations of the scientific understanding of landscapes were laid. The German School of Geography and the students of A. de Humboldt were, above all, responsible for initiating this enquiry into an understanding of the structure of the earth's surface, based on the global vision presented in the *Cosmos*. A significant contribution was made by J.Ch. Smuts and his theory of «holism» according to which the universe as well as all its parts and components form integrated units or «totalities». Such units are never the sum of their elements as the latter appear according to their own determined structure. The earth's surface or the epigeosphere is an integrated unit and thus neither as a whole nor in any of its parts or sections can it be treated as the sum of its elements. Moreover, these units are characterized by their discrete and dynamic character. Their dynamic nature comes from the exchange and transformation of matter and energy.

At the end of the 19th century and under the influence of the German School landscape studies were initiated in the Soviet Union under the name of Complex Physical Geography. In 1963 V.B. Sochava was to define the concept of the «Geosystem». The British and American Schools indirectly contributed to the theoretical conceptions of the landscape through the science of ecology and particularly with the definition of the «ecosystem». Yet it was L.V. Bertalanfy and his definition of the General System which provided a foundation on which all the systematic sciences were established. Finally, the configuration of a practical, small-scale method for landscape analysis by aerial photography in Australia, called C.S.I.R.O. (Commonwealth Scientific and Industrial Research Organization) in the 40s should not be forgotten.

The French School has made an important contribution to landscape studies in terms of taxonomy and in studies of the dynamic nature of the landscape from a physiognomic perspective. The most outstanding of the different groups is that at the University of Toulouse-Le Mirail under the direction of G. Bertrand.

In Spain such studies began at the end of the 60s at the University of Barcelona aided by the University of Toulouse-Le Mirail and Professor G. Bertrand, although it is important to recognize the rôle played by Dr. Manuel de Terán as a forerunner of these kind of works. The latter had an expert understanding of the German School of Geography and was highly interested in the problems of nature. His work is illustrative of his concern and interest in global studies being closely alligned with the work of the Germans, C. Troll and J. Schmithüsen. He makes quite clear his position when he says, «the disintegration and the plurality of disciplines produced by a highly marked tendency towards specialization which, at times, overcomes the interest for the existing interconnections, might lead to a disregard for reality. Reality in the earth's surface is not its landforms, neither the climatic conditions, the vegetation cover nor all that is added by man's labours, reality is the coherent whole.»

In the 60s several of Terán's followers continued, to a certain degree, with this approach. Dr. Eduardo Martínez de Pisón of the Universidad Autónoma de Madrid, has published the most papers on the subject in which in the theoretical field he accepts the systemic model for the conceptualization of the landscape although at first he considered man to be outside of this. He claimed, «it would be necessary to carry out a study of landscape interconnections and of man's disruptive activities in order to obtain a complex diagram which would faithfully reflect the system of reality». He was later, in a paper presented at the «V Coloquio de Geografía» held in Granada in 1982, in reference to anthropic evolution and the voluntary transformation of the natural landscapes, to present the geographic complex in its entirety, including man, the formal manifestation of which would or could be what we know as landscape. Dr. E. Martínez de Pisón also directed a study applying the C.S.I.R.O. method to the Spanish Meseta.

The University of Granada, and in particular F. Ortega Alba and F. Rodríguez Martínez, has shown great interest in the issues related to integrated landscapes. The work of the centre has gone through different phases following distinct lines of research. Initially, following the Anglosaxon line and to a lesser degree the British, it attempted, by sectorial analysis, to define the various global potentials of the landscapes and their possible uses. The nature of the work undertaken has clear implications for territorial planning. Later, in a second phase, two lines of research become evident. The first followed the School of Toulouse-Le Mirail in its traditional version; while the second maintained the British and American approach now aimed at landscape perception and its aesthetic appraisal.

A recently established school, but which has made a strong start, is that of the universities on the Canary Islands, where certain researchers such as E. Pérez-Chacón y Espina at the University of Las Palmas are following the approach at Toulouse-Le Mirail.

We particularly wish to highlight a nucleus in Madrid where a variety of centres are involved such as the Escuela Superior de Ingenieros de Montes under the direction of Dr. A. Ramos, the Ingenieros Agrónomos led by Dr. D. Gómez Orea and the Departamento de Ecología at the Universidad Autónoma in Madrid directed by F.G. Bernaldez, which recently has specialized, in line with American research, in the aesthetic appraisal of the landscape based on studies of the cognitive factors in relation with information theory, seeking a way of defining those landscapes preferred by different sectors of society.

Finally, mention must be made of the University of Barcelona, where Dr. Maria de Bolós began to undertake landscape studies in 1969 in attempting to find a more logical method than that of the traditional geographical method of P. Vidal de la Blache, for understanding the functioning and structure of the earth's surface. Starting from the lines of research of the European schools, initially with the Toulouse-Le Mirail, and later with the German and Soviet schools, an attempt was made to develop a different methodology, within the possibilities of experimentation and using data related to the country. The basic concepts are the following:

1- The geosystem. As defined by Sochava, corresponds to the application of the systemic conception to the landscape. The geosystem like the ecosystem is an

abstraction, a concept, a theoretical model and as such is applicable to any sector of the earth regardless of space or time. Contained within it are to be found three fundamental elements, albeit in differing proportions: abiotic, biotic and anthropic. Being an open system it is necessary to take into consideration the input and output of a determined matter and energy which gives it its dynamic quality. The basic natural energy of the geosystem is both external to the earth (above all solar radiation) as well as internal (gravitational energy). Within the same system and connected to the activity of its different subsystems exists a biological and anthropic energy which on transformation complements the other sources and gives rise to determined subsystems such as those created by man (agrosystem, urban system etc.). The geosystem is intrinsically dynamic and experiences variations in relation to the input and output of energy, thus there are short term variations, - hours, days - medium term, - seasons -, and long term, related to variations in solar energy. One of the dynamic aspects of the geosystem connected with the function of the ecosystem (biotic subsystem) is the natural tendency for recovery by succession, which gives the natural landscape the capacity of reconstructing itself on cessation of the contributions of complementary energy unrelated to the primitive system.

2.- The landscape. May be defined as a four-dimensional concrete reality, which corresponds to a determined portion of the epigeosphere, at a given moment in its history and which corresponds to the theoretical model of the geosystem. Given that the landscape is basically dynamic and may be considered to be a process whose origins are linked to those of the earth, it is necessary to specify with the utmost precision the point in its history which is wanted for research.

3.- The methodology. It is essential for the realization of any theoretical or applied study to have a methodological base, though this is always difficult due to the great complexity of nature. This should be established within the basic line accepted as «scientific method» of contemporary science, as for example that defined by Bunge.

The landscape shares the characteristics of a living organism and hence the methodology used in the study of landscapes has a certain similarity to that of medical science. The methodology consists of the following stages: 1) HISTORICAL, the stage of understanding the historical background of a given landscape, 2) ANALYSIS, the study of the elements and their interconnections, 3) DIAGNOSIS, defining the type of landscape, its state, i.e. classification 4) TREATMENT, the correction of impacts and improvements, 5) PROGNOSIS, the study of its dynamic nature in the present, 6) SINTERESIS, the definition and forecast of possible future impacts, given its dynamic nature.

Following this theoretical work and three conferences dedicated to integrated landscapes, in 1980, 1986 and 1990, the field has attained a certain level of importance in university research as regards its capacity for applied studies. Following the current trend which is bringing the university closer to society a «Servicio Científico Técnico de Gestión y Evolución del Paisaje» has been created to utilize effectively the human resources available to it. In this «Servicio» there are several important lines of research: a) the continuation of the theoretical analysis of environmental education, b) the evolution of the landscape and its historical study using sophisticated techniques (fossil pollen, macroremains, sediments, photointerpretation, etc.), c) present-day landscape manage-

ment, physical planning, land classification according to the landscape etc., d) agrogeography, (harvest forecasts using aeropolinic emission analysis, daily agricultural information for farmers, AGROTEX, mountain tourism, nivology, avalanche forecasting, etc.)

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Geography in Spain (1970-1990)