

**THEORY
AND PRACTICE
IN BRITISH
AND HUNGARIAN
GEOGRAPHY**

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AKADÉMIAI KIADÓ • BUDAPEST

THEORY AND PRACTICE IN BRITISH AND HUNGARIAN GEOGRAPHY

Proceedings of the 4th British-Hungarian
Geographical Seminar, Nyiregyháza,
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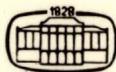
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Edited by P. A. COMPTON and M. PÉCSI

This collection of papers was meant to provide a survey of the latest achievements in British and Hungarian geography, primarily focussing on human geographical issues. Of the wide range of topics covered some are traditional in the history of British-Hungarian geographical seminars (urban geography and energy problems), while others emerge as new fields of interest: the racist approach to geography, universal geography in the two countries and geographical information systems.

The general title of the volume truly reflects how different fields and approaches were included. The first chapter is devoted to the concepts of geography and to papers on geography education in Britain and Hungary. The next comprises papers on the possible utilization of physical potentials and outlines the importance of an applied trend in physical geography aiming at supplying useful information for the various utilizations of land. The section of settlement geographical studies provides a historical perspective to the investigation of settlements and their network. Finally, three papers deal with issues of energy policy in a broad economic and societal context.

The volume gives a fresh account for researchers of the recent trends in British and Hungarian human geography and in many points comparisons can be made from certain aspects.



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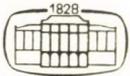
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PRESIDENTIAL ADDRESS
Delivered to the
Fourth British-Hungarian Geographical Seminar

M. PÉCSI

The first British-Hungarian Geographical Seminar was held in Nottingham and London in 1974 and the second in Budapest and Szeged in 1977, when the participants exchanged views of regional development policies and settlement systems respectively. Both were jointly sponsored by the Great Britain-East Europe Centre and British Council on the British side, and by the Institute of Cultural Relations and the Hungarian Academy of Sciences on the Hungarian side. The two seminars marked the culmination of many years of formal and informal contacts between the geographers of the two countries at international congresses in both Britain and Hungary.

The third bilateral seminar, on the theme of environmental management, was organised by the Queen's University of Belfast and the University of East Anglia, and took place in Norwich in 1982. This, the fourth Seminar (1987) in the series, has been organised by the Geographical Research Institute of the Hungarian Academy of Sciences and the Bessenyei György College of Education in Nyíregyháza. It has been sponsored by the Hungarian National Committee of the IGU and the Academy of Sciences with some additional financial support from the Karl Marx University of Economics, Budapest, and the Centre for Regional Studies, Pécs.

Unlike the previous meetings, this seminar has not been organised around a strict theme; rather, we have gathered to discuss in broad terms some of the contemporary problems that geography now faces. Conceptually I wish to emphasize the great importance of the unity of geography, and the relevance of geographical methods, approaches and practice for regional policy and environmental protection. During the two

days of formal sessions, twenty-two papers will be presented by British and Hungarian experts. Many of them are concerned with environmental or regional development policy and with geographical information systems which are important tools for the assessment and monitoring of the total geographical environment.

Bilateral seminars such as this provide opportunities for the exchange of experience and information. Moreover, the meetings serve to build personal relations among the participants from the two countries, that help widen research horizons and assist with the spread of new methodologies as well as with the more appropriate application of traditional methods. Such seminars may also promote joint geographical research of international significance. In the name of the Hungarian participants, I warmly welcome the British delegates. I also wish to extend our thanks to the organizers of the seminar, especially to Paul Compton, Lajos Gööz and Dénes Lóczy, who made considerable efforts to make this meeting a reality. In addition I should like to acknowledge the help given by the local leaders and organizers and particularly the College of Education here in Nyíregyháza, for supporting and sponsoring the organization of the seminar and field excursions.

On the occasion of the opening of this seminar it falls to me to present an overview of the state of the unity of geography in Hungary, and to explain our concept of the total geographical environment of society.

THE CONCEPT OF THE TOTAL GEOGRAPHICAL ENVIRONMENT OF SOCIETY

The objectives of geographical investigations have been reformulated several times. Moreover, the research emphases have changed in accordance with the social and scientific requirements from geography.

Taking account of both traditional and more recent views, the task of geography may be defined as the systematic and theoretical investigation, interpretation, diagnosis, typification and prognostication of spatially variable phenomena on the Earth's surface, both the natural and man-made: including

their existing state and processes of change, together with specific geographical processes and relationships. From this definition it follows that the individual branches of geography by themselves are not representative of the discipline as a whole. In interpreting the Earth, the geographical environment of man as a functioning whole, we are involved with many factors that are studied individually by other branches of science.

Geography has traditionally studied these many-sided relationships and interactions. More recently, however, geography has had to consider specific spatial components and their effects even when interpreting the individual factors of the geographical environment. This is characteristic of the approach to and the methodology of the geographical analysis of space. Thus, in my view, the geographical environment of society together involves not only nature itself but also society, together with its activities, interactions and outcomes (PÉCSI 1974, 1979, 1984).

In Hungary, the above basic principles have been applied for over a decade to the systematic and theoretical investigation of the interactions and relationships between man and his physical environment within a multi-disciplinary framework. Among other things, this approach has been fruitfully applied to the regional survey of environmental potentials as part of our research effort in physical geography and geographical ecosystems.

An integral part of the analysis and interpretation of the predictable ecological consequences of the location of major technical establishments is environmental. It is worth noting that the new edition of the "National Atlas of Hungary" is part of an interministerial project examining these questions.

Economic reform has underlined the importance of the economic and social branches of geography to relieve the consequences of economic imbalances, and a rapid progress has occurred in both branches but especially in settlement geography.

The recent critical man-environment interactions have called for the protection of the environment for the ecological and economic viewpoints. We are convinced that the conservation of nature and environmental protection with all the implications for the rational and economic use of natural resources requires an integrated system of environmental management. We believe that within a multidisciplinary approach to national environmental management, geography as a whole should play an important role and this underlines the importance of both physical and human geography.

As part of this overall task, interdisciplinary research is already in progress which aims at forecasting environmental impacts and for this the participation of the geographer is indispensable. The tasks of recent years, for instance, the assessments of the ecological consequences of constructing a barrage across the Danube for the generation of hydro-electric power or of bauxite mining, or of the utilization of karst and thermal waters, have increased the significance of several branches of geographical research and have widened the scope of earlier investigations. As examples of the latter, we may cite relief evaluation and landscape and environmental analysis that have led to the improvement of land utilization, and have stimulated the extension of engineering-geomorphological research.

Regional geography has also undergone a renaissance, but due to new requirements of evaluating spatial relationships as well as landscape and environmental potential, its approach and tasks have undergone drastic change. The emphasis is no longer on regional uniqueness and the heterogeneity of geographical space but rather on the investigation of the dialectic homogeneity of areas. The monographs of Hungarian landscapes have been supplemented by an anthropocentric view while the work on microregionalisation is now supported by computer and remote sensing techniques.

GEOGRAPHY IN PUBLIC AFFAIRS

It follows from the above discussion that geography should make itself useful to society. But having said that, the

discipline also has its academic responsibilities and if fundamental research is neglected, this could adversely influence the evolution of geography in the future.

The present economic crisis has created many social stresses and has lasted long enough. In these circumstances it is the duty of science, including geography, to serve the wider social interest.

Indeed, in Hungary, geography has kept in constant close contact with public affairs, and during the last five years has actively shared in the research tasks assigned by government as well as helping to prepare the ground for certain political and economic changes. The latter include:

- preparatory work on the Land Act;
- reintroduction of a system of land evaluation;
- the preparation of expert reports for government ministries on such matters as *settlement development* and environmental impact statements relating to major technical establishments like the Gabčíkovo-Nagymaros hydroelectric scheme on the Danube.

The economic evaluation of habitats has generated new practical research directions, like the computer-based assessments of the ecological suitability of different agricultural regions for crop cultivation. Such research is capable of precisely delimiting the agroecological microregions of the country, and should prove a useful tool for selecting the optimum area for the cultivation of different crops during a period of limited financial resources. At the same time it should allow the determination of locational rent.

I believe that the most important tasks of both regional and socio-economic geography involve the quantification of environmental impacts and the analysis of the environment itself. In my view, the quality of life and of the environment will remain a major focus of geographical research for the foreseeable future.

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GEOGRAPHY: THEORY AND EDUCATION

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UNITY IN ANGLO-AMERICAN GEOGRAPHY

E. GRAHAM

Over the past two decades Anglo-American geography has emerged from a state of methodological naïvety into a period of prolonged methodological turmoil. Although identity crises appear to be endemic, geography in the Anglo-American tradition currently faces an unprecedented onslaught on its integrity as a complex set of pressures from outwith and within the geographic community conspire to mould its future. This paper will focus on the recent past in an attempt to identify some of these pressures and to outline the major issues of contention which must be addressed if academic geography is to emerge intact. It is thus both a review of geography's recent history and a perspective on the future.

A LEGACY OF CHANGE

To non-geographers, the most striking feature of geography today must surely be its diversity. A subject matter that extends from the minutia of ice-physics to the minutia of statistical demography does not lend itself to easy definition. P.GOULD (1985), in his own review of modern geography, captures something of the discomfiture of the geographer pressed to answer the question '...and what do geographer's do?' in his caricature of a cocktail party conversation. GOULD's answers are always unsatisfactory for either they are specific and highly technical or uninformatively vague.

The desperate 'I teach geography' is the worst of all because, instead of leaving the rest of the world mildly bemused, it frequently serves to confirm a misunderstanding, provoking questions about longest rivers, average annual temperatures and the exports and imports of remote African states. Ironically it is this basic knowledge of the world map and the characteristics of its political divisions of which today's geography student is most likely to be ignorant, for geography has long ago swung away from the recitation of capes and bays. Even regional geography proper spent a considerable time in the doldrums and recent attempts at revival (HART, 1982) have not yet been widely enough accepted, at least in Britain, to have filtered through to the school curricula. This illustrates the second major feature of geography at the present time, its state of flux. Change came so rapidly in the late 1950s and into the 1960s that it was quickly characterised as revolutionary (BURTON, 1963). It bred a generation of geographers with statistical computing skills in tune with the growing technological competence and optimism of the age. For a while it transformed Anglo-American geography almost beyond recognition. In the space of a few years geography textbooks changed both in style and in content. PERPILLOU's widely used textbook on HUMAN GEOGRAPHY, for example, includes a section on railways which contains enough simple factual data to satisfy the most ardent of cocktail party conversationalists:

Already in 1869 the 20,000 locomotives in service in Europe were calculated to represent greater power than that of the 1,300,000,000 persons who then formed the total population. At present, so far as censuses may be regarded as accurate, there are more than 140,000 locomotives in the world, 71,000 of which are in Europe and 45,000 in the United States.
(PERPILLOU, 1966 translation, p.331).

Written in the late 1950s, this represents the 'old' geography, but even before its translation into English was complete the promulgation of a 'new' geography was well under way. In

Britain, as in America, the influence of a group of economists led by W. ISARD was making itself felt in the traditionally exceptionalist spheres of academic geography. Thus, by 1969, the interests of HAGGETT and CHORLEY in railways were somewhat different to those detailed in PERPILLOU's text:

Between 1872 and 1932 the total length of the (London Underground) system extended from twenty to over two hundred miles. This tenfold increase was accompanied by much less spectacular changes in its topological properties; over the same period the average edge length increased by about one half from 0.51 miles to 0.76 miles while the connectivity ratios moved from fifteen to ten per cent redundancy as measured by the Alpha index, and from 1.03 to only 1.13 on the Beta index.

(HAGGETT and CHORLEY, 1969, pp. 270-1).

These authors used the growth of the London underground rail network as an example in a chapter on 'Node-connecting Sequences' and the rationale of their book was not to inform the reader about the properties of particular transport networks but rather to provide instruction in ways of *analysing* networks, networks of any kind. This emphasis on the general features of some category of phenomena, and the development of specialised measurements were two of the hallmarks of the new geography, which incidentally removed geography from the realms of general knowledge and placed it beyond the apprehension of the average cocktail party-goer. Whilst a lucky guess might penetrate the meaning of 'edge length', only an expert could deal in Alpha and Beta indices. And the expert had to be quantitatively minded, trained in mathematics and statistics. This was the revolution that would ensure geographers a place in academia for they could never again be confused with travel writers or the untrained amateur.

It is likely that the pressures outside academic geography were as important as those inside in bringing about this change. The wider historical context in which any academic tradition develops is always important. In the nineteenth century, for example, geography in common with a wide range

of related studies had been profoundly influenced by Darwinian ideas. It is not only the intellectual context of development that is important, however, for as STODDART (1986) shows so well historical contingencies and the personalities involved both played an important role in the establishment of geography departments in British universities. Indeed STODDART argues that "the more the complexity is understood, the less revolutionary the process (of geography's development) seems" (STODDART, 1986, p.14). The same comment could apply to the quantitative revolution. Certainly the moves towards professionalism were not new. As TAYLOR (1986) points out, the tension between 'general' geographical societies, which catered for explorers and travellers, and the needs of an academic geography community had led to the establishment of the Association of American Geographers as early as 1904. And in Britain the slow growth of geography teaching in the universities produced a group of young academic geographers who sought opportunities for publication of more 'academic' works than those which concerned exploration or mountaineering. It was this that provided a major catalyst in the founding of the Institute of British Geographers in 1933. From the very beginning the academic status of the society was to be protected by ensuring that university scholars effectively controlled policy and thus membership (STEEL, 1984). This was the institutionalisation of a division between 'popular' geography and 'academic' geography which was never clear-cut and is still problematic. Nevertheless, the changes that began in Anglo-American geography in the late 1950s made this division seem more secure than it had ever been before. By introducing a whole range of new quantitative techniques and their attendant vocabulary, geographers could claim a set of intellectual skills which moved them much more clearly towards the academic or specialist end of the knowledge spectrum. It is for this reason that the 'new' geography deserves the epithet despite having developed from the old.

GEOGRAPHY IN THE POST-POSITIVIST ERA

The tale is a well-known one, told and retold many times, of a revolution which transformed geography from the stuff of which travel books are made into the stuff from which science is born. And how, later, there was a counter revolution, and then another, and another...
(JONES, 1980, p. 525).

We can perhaps forgive the over-simplification, for the reviewer of JOHNSTON's (1979) account of Anglo-American human geography since 1945 accurately conveys a sense of what has been happening in human geography since that first, quantitative, revolution. Whilst for many geographers in the early 1960s the acquiring of mathematical and statistical expertise genuinely opened up research possibilities, for others the initial promise of great theoretical and scientific progress in geography was never realised. A few of the original innovators like BUNGE and OLSSON became profoundly disenchanted with the 'new' human geography and convinced of its intellectual aridity. Many others began to express doubts and reservations and to examine the new developments critically. The brief period of post-revolution euphoria was over by 1969 and in the years since then other 'new' geographies have struggled to establish themselves. Behavioural geography, radical geography and humanistic geography have all developed around different critiques of what has become known as positivist geography (see *Appendix*). The result has been an unprecedented and apparently still escalating fragmentation of the geographic research community which has raised many questions about the unity of geography and thus led some to demand the redefinition of our academic categories.

The story of geography's recent development has been told elsewhere (JOHNSTON, 1979 and 1986a; JAMES and MARTIN, 1981; BUTTIMER, 198; BILLINGE, GREGORY and MARTIN, 1984; GREGORY, 1985; GOULD, 1985), although it is noteworthy that only JAMES and MARTIN attempt to be encyclopaedic. It is not the details of that development which are of concern here, however. Rather,

I want to sketch some of the underlying trends or changes of emphasis evident in geography's recent history in order to illustrate the dimensions of disunity and to support the contention that the quest for unity in geography is both more urgent and more problematic than ever before. The whole impetus for the quantitative revolution came from the adoption and subsequent development by geographers of established mathematical and statistical techniques. For a while it seemed as if the common core of techniques could unite a geography influenced by divergent traditions in history and geology under the new banner of spatial (or locational) analysis. It soon became apparent, however, that techniques serve rather than create or define distinctive fields of knowledge and that the enduring impact of the quantitative revolution would not be the creation of one geography. Instead it set in motion a process of philosophical reflection that brought about a new 'coming of age' (ZELINSKY, 1978). The first hint of this came in 1969 with the publication of the first major treatise on the nature of geography since HARTSHORNE's works of 1939 and 1959. In 1969 D.HARVEY, in the preface to 'EXPLANATION IN GEOGRAPHY', justified its publication in terms of his own intellectual development and the realisation that,

The quantitative revolution implied a philosophical revolution. If I did not adjust my philosophy, the process of quantification would simply lead me into a cul-de-sac.
(HARVEY, 1969, p.vi).

The philosophical revolution which HARVEY proceeded to describe to a geographical audience ripe to receive it was that which introduced geographers at large to the 'fantastic power of the scientific method'. The contrast with HARTSHORNE's treatise is indicative of the revolution that separates the two publications. HARTSHORNE's (1939) was a scholarly but essentially inward and backward looking work which attempted to justify a certain conception of geography in terms of its long historical pedigree. HARVEY on the other hand, was looking

to the wider philosophical literature and to the future when geographers would not be afraid to 'think theoretically and analytically'. The concomitant of this was that geographers were required to think about what they were doing in a way in which they had not done before. Philosophical problems of induction, of verification and of the structure of scientific theories became problems for geographers. The methodology of geography and its philosophical underpinnings not only could be discussed but came to be seen as worth discussing. The fact that that discussion has not yet proceeded far enough should not divert us from recognising the importance of its initiation. An enhanced understanding of the ontological and epistemological (see *Appendix*) concerns of philosophy has brought with it a new, if changing, appreciation of the basis of geography's perennial identity crisis and has introduced different grounds for claims of disunity.

A QUESTION OF IDENTITY

Historical tradition confers upon its inheritors a sense of identity. Whether for an individual, an organisation or a whole people, historical roots are important not only in providing a past to belong to but also in helping to define who or what they are at the present time. HARTSHORNE (1939) recognised this power of tradition and used it in his attempt to establish the nature or identity of contemporary geography. In selecting from the historical record, however, he left himself open to charges of partiality (JOHNSTON, 1983); a partial history necessarily failing to reveal the whole geography's identity. Of course, we are not prisoners of our past, for tradition is only one influence on current identity. It is possible to detect major disjunctions in the lives of people and institutions when change is more rapid or more radical. In geography, the conundrum of evolution or revolution (CHISHOLM, 1975) revolves around the relative degrees of continuity and change between 'old' and 'new' geographies. That there is an element of the former cannot be doubted, although it is the nature of the latter that has introduced new dimensions to our current identity crisis.

Identity is not only informed by a shared or common past but requires a present coherence or unity. The famous story of Dr Jekyll and Mr Hyde reminds us of the complexities of the notion of identity. A dual personality, or two men in one body, raises many questions about personal identity. What is clear, however, is that the identity of Mr Hyde is based upon the appreciation of a certain unity to this part of Dr Jekyll's personality which distinguishes it from his 'normal' or other personality. The bodily identity is not in question since it derives a phenomenal coherence from its physical form. The analogy with geography should not be overplayed but is instructive in two respects. First, it demonstrates that identity can be found at several different levels and that identities may well be overlapping sets. Each identity must have some internal coherence and we cannot look for or judge that coherence without asking the question 'identity as what?' Secondly, any particular identity relies upon not only some internal unity but also a sense of what differentiates the phenomenon from the rest of the world. The identity of geography no less than the identity of Mr Hyde is dependent upon an appreciation of the basis and coherence of that identity. It could turn out that geography too is fundamentally schizophrenic!

The quantitative revolution and its identification of geography as a spatial science (ABLER, ADAMS and GOULD, 1972) shifted the grounds of geography's identity. By further professionalising academic geography and widening the gulf between it and what might be called popular geography (JOHNSTON, 1986b, calls it vernacular geography) the new geography was bound to assert its difference from the accounts of places and countries which passed as geography in many libraries. Its academic identity could no longer be a mere extension of its popular identity. Past arguments about the nature of geography had tended to focus on the definition of its subject-matter: Do geographer's study landscapes or regions or places? However, geography's *academic* credentials came to depend not so much on what was studied as on how it was studied; its identity as an *academic field of study* rested upon the coherence of

the disciplined mode or thought or methodology adopted by the professional geographer. This is what HARVEY (1969) recognised when he talked about 'the philosophy of the scientific method which was implicit in quantification' and argued for a much greater awareness of the nature of scientific argument and inference. It was scientific method that would give the new geography its new identity as an academic study. Only four years later HARVEY (1973) had changed his mind about the promise of scientific method and sketched instead the possibility of radical, socialist geography informed by the writings of K.MARX. This was again to change geography, but in both cases it was the method that would furnish geography's new and academic identity.

The grounding of the identity of academic geography in its methodology has brought with it new problems. First, the securing of geography's academic status through the adoption of the rigorous method of the physical sciences has led to the progressive blurring of the distinction between geography and other sciences. If geography could be like other sciences what was there to distinguish it from them? The systematic specialisation of geographers which has become so remarkable a feature of modern geography in Britain and North America is not an incidental accompaniment of the self-conscious adoption of scientific method but an inevitable result of a mode of thinking based upon the isolation and detection of the universal qualities of carefully defined categories of phenomena. And, since geographers could hardly lay sole claim to the phenomena they studied, their distinctiveness or identity could no longer, apparently, be derived from their subject-matter. Hence we now have biogeographers, glacial geomorphologists, economic geographers and urban geographers who see their *raison d'être* as the study of a particular type of phenomenon. All recognise that non-geographers also have academic interests in these phenomena, interests which overlap with those of the geographers themselves, and most are well read in the literature of the closest non-geography specialism. This in turn has encouraged the further fragmentation of geo-

graphy as the geographer's specialist research has become integrated with that of the non-geographer until, as FREEMAN notes,

...at times it has seemed that some geographers were so attracted to the findings of cognate studies that they have almost ceased to be geographers and have become applied economists, economic historians, sociologists, statisticians, mathematicians, geologists or others.

(FREEMAN, 1986, pp. 441-2)

Secondly, the active methodological debate which HARVEY (1969) can claim to have stimulated has led to a number of methodological divisions within geography which have introduced an altogether more complex basis of differentiation or fragmentation. We now have behavioural geographers, radical geographers and humanistic geographers (see *Appendix*) - to select only a few major categories - each claiming to employ a distinctive type of approach to their subject-matter. What makes these approaches all 'geographies' is invariably left unspecified. It is clear, however, that most of this methodological fragmentation has taken place in human geography, that it has arisen in the context of various critiques of positivist science and that it is not unique to geography but more widely spread throughout the social sciences. Thus a heightened awareness of methodological differences and the potential of various methodological strategies has also brought human geography nearer to non-geographers which face similar methodological challenges. In particular, the arguments for grounding human geography in social theory as well as the potential of doing so have recently been explored in a volume edited by GREGORY and URRY (1985). Many of the authors in that volume argue for the integration of the concerns of the social theorist with the traditional concerns of the geographer and historian, space and time. As URRY (1985, p.20) notes, "Social analyses are held to be curiously negligent of the spatio-temporal location and structuring of the phenomena under investigation". The human geographer has thus, it is argued, something to contribute to social theory.

But if such a contribution is to be pursued, it will inevitably lead to a further blurring of academic boundaries and provide further encouragement for the crisis of confidence in geography's integrity.

I am not for a moment suggesting that GIDDENS' (1985) attempts to develop a theory of structuration in which social systems are seen as constituted across time-space should be discouraged because they threaten the identity of geography. Nor can it be denied that many interesting research problems arise at what have traditionally been seen as interfaces between geography and cognate studies. Indeed it is vital to the advancement of human knowledge that such problems are recognised and researched. In the context of a debate about the unity of geography, however, we must ask whether this greatly increased attention to integration across what have until now been conceived of as 'boundaries' should not lead us to call into question our whole conception of the proper divisions of knowledge. The authors in a recent collection of essays on THE FUTURE OF GEOGRAPHY (JOHNSTON ed., 1985) would answer in the affirmative. WORSLEY, a geomorphologist, argues that our academic categories have already outlived their usefulness and that geomorphology in Britain would fare much better if it were to be realigned with geology. Whilst ELIOT HURST is prepared to declare that geography has neither existence nor future on the grounds that there can be only one holistic (marxist) social science. Together these claims form a serious challenge to the continued existence and coherence of geography. WORSLEY's argument is of particular interest because he is directly concerned with the wider identity of his chosen sub-specialism, geomorphology. He wishes to strengthen that identity by placing it firmly in the category of geoscience. ELIOT HURST's argument, on the other hand, proceeds in the opposite direction by starting from the general category of social science and maintaining that all potential divisions therein (like geography) are outmoded and that there can be no valid basis for their separate identity. It is in this intellectual context that the question of geography's unity arises at the present time. Further, the accelerating disunity and disarray which

has characterised academic geography for over a decade has recently been exacerbated by the threat of financial cuts and rationalisation now facing British universities. The quest for a convincing statement of geography's coherent (or unified) identity has become both more urgent and more difficult. The dimensions of disunity in modern geography are multiple, but two warrant discussion because of the direction they will take that quest in the future. These are institutionalised disunity and epistemological disunity, and they are closely related.

INSTITUTIONALISED DISUNITY

Anglo-American geography suffers from a number of institutionalised divisions which impede the search for a unified or corporate identity by emphasising the differences within geography. Not all institutionalised divisions are of this sort. The acceptance of geography as a member of the institution of academia created a division between popular and academic geography which has grown in strength ever since H. MACKINDER was appointed the first reader in geography at Oxford in 1887 (see COMPTON in this volume). This major step forward in the struggle for academic acceptance did much to strengthen geography's academic identity as a properly intellectual study. The process of acceptance in British universities was a slow one, however, with the result that geography departments were introduced into organisational structures which geographers had played little part in shaping. The faculty arrangements of most British universities had evolved in response to pre-twentieth century conceptions of major divisions of knowledge such as Arts, Science and most recently Social Science. Such faculty divisions are not fixed but they tend to be slow to change. And today it is often at faculty level that important powers over the distribution of funding, the maintenance of academic standards and the recruitment of students reside. Thus, for any number of good sound practical reasons, it can matter which faculty a department belongs to. In the case of geography, the choice

is far from clear. Frequently geography departments straddle faculty boundaries and it is all too easy in such circumstances for others to view geography as fundamentally divided. After all, if the physical and the social sciences really are major divisions of knowledge what can unite a geography which appears to contain a little of both?

The British Government as the major funding agency for British Universities is currently taking unprecedented steps to shape the future of the universities and in so doing is encouraging further entrenchment of our faculty system. A concern with economic prosperity and the need to improve the training of British managers in order to revitalise British industry (see DAWSON in this volume) has led to an ever greater emphasis on the practical advantages and applications of education. Thus, in a situation of severe financial cutbacks, policies of selective funding and rationalisation are favouring developments on the science and technology front and promise to produce far-reaching changes in some institutions. Technology parks, where the expertise and inventiveness of the university scientist can be translated into marketable products, are now becoming a commonplace feature of the university landscape. The plight of geography in this situation is unclear but two features are noteworthy. First, the threat to geography from underfunding is a real one. And secondly, the threat itself, far from uniting geography, is proving divisive as the allegiances of geographers are split across the faculty system. These will be discussed in turn.

In a recent presidential address to the Institute of British Geographers on 'The State of Geography' CLAYTON noted the seriousness of the financial threat:

...it is easy to envisage a reduction in provision, either to the advantage of the other social sciences or perhaps even more probably to make room for increases in Information Technology, engineering and science.

(CLAYTON, 1985, p.7)

In response the Institute has undertaken a review of the current status of geography, asking each of its seventeen study groups to outline the major research questions and problems being investigated by its members. The aim is to produce a coherent statement which will convey to the general public both the vitality and the usefulness of geography. To this end a preliminary report has been compiled (DANIELS et al., 1987) which identifies research foci in British geography. Despite considerable success in compressing hundreds of individual research interests into seven major substantive foci, the list still suggests a highly eclectic area of study:

1. Welfare issues
2. The restructuring of the UK economy and its impact on society
3. Resource assessment and management
4. The reconstruction of palaeoenvironments
5. The role of institutions as initiators of change
6. The urban fringe
7. Atmospheric and hydrological processes

In many ways this is a curious collection because some foci, like 'the restructuring of the UK economy', are highly topical and probably ephemeral whereas others, like 'hydrological processes', are much more general and represent a more enduring geographical interest. Whilst, then, the list may convince some non-geographers of geography's usefulness, it is not going to further our search for a unified identity for geography as a whole.

It is tempting to suppose that external threats to the continuation of geography in British institutions of higher education will produce a certain unity in adversity amongst professional geographers. No doubt there are departments where agreement on self-preservation strategies is easily reached, yet the institutionalised divisions within the university system militate against unanimity. In circumstances where science is finding favour and both social science and arts subjects are being cut disproportionately, it is not surprising that geography departments find merit in emphasising the scientific character of geography. It is important

to note that, even were all geographers to agree on such an emphasis, it would do nothing to establish the *academic* unity of geography. As I have argued elsewhere (GRAHAM, 1986) a threat to jobs or future funding can provide a certain unity of purpose, an immediate practical concern which requires pragmatic decision-making in the short term. But such a common cause can be shared across departmental divisions and by both academics and non-academics in the workplace. It tells us little about the unity or otherwise of geography as an academic study. Moreover, it is evident that not all geographers do agree, even at a pragmatic level, on the main features of geography which should be stressed at the present time. The recent history of geography, as we have seen, has brought human geography through a series of fundamental methodological changes and left a legacy of epistemological diversity. The one thread that connects the series is an appreciation of the severe limitations of positivist scientific method in a human geography sensitive to the nature and operation of human agency. Many human geographers, and not just humanistic geographers, would argue against the identification of human geography with the experimental physical sciences. Thus, unlike the majority of physical geographers, these human geographers wish to identify with the social sciences. And as faculty divisions deepen, geography departments will find themselves with seriously split identities.

Although the divide between human and physical geography is not a simple one, it is the most commonly mentioned divide in geography and one used to structure much geography teaching. However, progressive diversity over the last decade has heightened the identity of finer sub-specialisms, none more so than that of 'geomorphology'. WORSLEY (1979 and 1985), for example, in his challenge to establish a more logical link for geomorphology with geology, is never in doubt about the identity of geomorphology. And it is quite clear from his argument that he considers himself to be first and foremost a geomorphologist (not a geographer or a geologist). He has three major contentions:

1. Geomorphology is in an anomalous position within the 'parent' geography.
2. Geomorphology has suffered and continues to suffer from its links with geography.
3. Realignment with the geosciences would improve the vitality of geomorphology.

All three have been challenged (DOORNKAMP, 1979; SUGDEN, 1979), but the details of WORSLEY's arguments are less important here than the assumptions which underlie them. He portrays geomorphology as an area of study with an internal unity or clear identity but seeking more conducive umbrella under which to shelter in order to promote and emphasise its real scientific character. He thus assumes that divisions of knowledge need not be arbitrary and can be rational for there can be sound academic reasons for grouping together certain areas of study. He concludes the most recent version of his case by expressing the hope that, "surely a more rational situation will ultimately emerge" (WORSLEY, 1985, p.41). What he does not consider is how large these groupings should be for different purposes or whether his own specialism, geomorphology, is not already too fine a division of knowledge to claim such a strong individual identity. To tackle these questions, we must start with a much broader brush and ask what the major divisions of knowledge might be.

EPISTEMOLOGICAL DISUNITY

The proper basis for the division of knowledge in general is too ambitious a topic for the present paper. However, since our primary interest is in the status of geography, we can begin to unravel some of the more likely candidates by examining the writings of geographers. JOHNSTON (1986b) calls geography 'a human creation' and TAYLOR declares,

Divisions of reality are man-made; geography and any other 'discipline' is a creation produced by groups of people in specific contexts. It follows that any supposed unity of geography is a construct applied to reality by geographers: there is nothing natural about either geography or its unity. (TAYLOR, 1986, p.444)

It also follows, presumably, that since both human constructs and specific contexts can change so can the unity of geography. JOHNSTON (1985) too emphasises the importance of particular circumstances or context and thus the potentially temporary character of divisions of knowledge. In doing so, both he and TAYLOR promote a conception of geography which has more to do with historical accident than rational thought. I have already admitted that practical concerns and pressures, including financial incentives and constraints, do influence the state of geography at any particular time. So do chance occurrences like the personalities or contacts of individual geographers. But it would be wrong to think that ideas about geography's unity arise either at the whim of the geographic community or solely as a response to perceived advantage in a particular historical context. It may be nonsense to conceive of geography as a natural division of knowledge (since no knowledge is 'natural'?) but this is no reason to discount, *a priori*, the possibility that it is an important and internally coherent category of knowledge. Like any other classification the isolation of 'geography' as a sensible or rational grouping must be defended on grounds of similarity and difference. The similarities and differences we must consider here, however, are not a convergence (or divergence) of practical interests or bureaucratic conveniences but rather those connected with the nature of the enterprise itself, the gaining of knowledge. Knowledge may not come in 'natural' divisions but nor is it indivisible. And our own understanding of how it might properly be divided is an influence upon our conceptions of the nature of geography which should not be underestimated.

What the quantitative revolution did for Anglo-American geography, through the writings of those like HARVEY who recognised that the introduction of new techniques must stimulate more profound methodological change, was to make geographers more aware of the relevance of epistemological debates in modern philosophy to progress in geography. It has now become commonplace for geographers, especially human geographers,

to adopt epistemological or methodological stances - positivist or anti-positivist - and to stress the differences between these. JOHNSTON (1983), for example, notes four different approaches in modern human geography, each to be identified by a distinctive epistemology. And JACKSON and SMITH (1984) represent what they call social geography in terms of 'the philosophical triad' of positivism, humanism and structuralism (see *Appendix*). Since JOHNSTON's extra category is empiricism (see *Appendix*) which many human geographers would reject as naïve, we can conclude that, at least at the level of overt analysis, there is a good deal of agreement as to the major methodological divisions within human/social geography. Physical geographers are considerably more reticent about their epistemological underpinnings but, pressed to do so, would probably follow GREGORY (1985) in recognising the influence of positivism. Some may worry about the philosophical implications of developments in quantum physics whilst others may rest content with a low level empiricism. The majority, however, appear to aspire to be theoretical scientists in the Comtean mould, an aspiration which distances them from their humanist and structuralist colleagues. Thus the current state of geographers' self-understanding suggests that, in the practice of geography, geographers see themselves as engaged in acquiring knowledge in different ways. To use TAYLOR's (1986) terminology, disunity is the construct currently favoured by geographers. Methodological differences are evident and they divide us in terms of how we conceive of research at a fairly fundamental level. Whilst the positivist is looking for the general in the particular, for example, the structuralist seeks to 'look behind' appearances and the humanist may strive for a presuppositionless understanding of 'the thing in itself'. There is, of course, nothing 'natural' about these divisions but this should not be taken to mean that they are arbitrary. They describe more or less different conceptions of how knowledge can be acquired. And it is always open to us to ask whether these conceptions are coherent and whether the differences they represent are indeed irreconcilable. As WORSLEY (1985) and ELIOT HURST (1985) assume, there

can be rationale to the division of knowledge. Where a particular division appears to be problematic in practice, it is that rationale and not the details of the practice that should be called into question.

Epistemological disunity characterises Anglo-American geography at the present time. This is represented in the different ways in which different geographers conceive of and tackle research problems. Institutionalised division exacerbates this disunity as social science and science faculties claim allegiances which serve to emphasise the differences between geographers and the similarities between interest group within geography and those outside. This does not mean that the search for a unified conception of geography is a hopeless one, but only that we must be careful to search in the right place. Our conceptions of how knowledge can be gained, of epistemological possibilities, must be our starting point and not the details of geographical practice. As GOULD (1982, p.1) recognises, "the explosive nature of geographic inquiry seems to have left too little time for critical reflection". The unity of geography can no longer be found in what geographers do. If it is to be found at all, it will be through a reflective process which starts with the more abstract questions of epistemology.

FUTURE DEBATE

We have been looking back on the recent past in Anglo-American geography and on the pressures, both external and internal, both practical and methodological, which have contributed to its current crisis of identity. The need for a unified public identity for geography is now a matter of immediate practical concern, yet the huge eclecticism of the last decade makes such unity ever less likely as geographers consistently fail to demonstrate how their substantive research relates to a wider 'geographical' whole. Many have ceased to believe in that whole and some, like WORSLEY (1985), think that it is time that they stopped pretending to be geographers and declared their real identities. Others, like JOHNSTON

(1986b), recognise major epistemological differences within geography but declare themselves content with the current accommodation. It is only when we strip away practical considerations, however, that we reach the real question of geography's unity; the question of whether geography is a coherent division of knowledge and can thus claim academic unity. The answer to this question will not be found by examining the topics currently being investigated by geographers, even where these can be reduced to a small number of research foci. Rather, it must be recognised that all substantive research involves at least implicit assumptions about how knowledge is to be acquired. Where such assumptions remain largely implicit and no methodological tradition is dominant, the scope for fragmentation and methodological chaos is considerable. This is the state of Anglo-American geography today. There is thus little use in looking for unity in what geographers do.

More promising than looking for unity in what geographers have done is to examine what geographers might do. Both GOUDIE (1986) and DOUGLAS (1986) approach the question of unity from this standpoint and the latter even declares that the unity of geography is obvious. Though both are concerned with the contribution that geographers can make to urgent global, regional and local problems, they both fail to present convincing cases for the academic unity of geography as a division of knowledge. They quite rightly point out that there are certain practical problems, like those of rural development in the Third World, which require the expertise of both physical and human geographers but neither tells us why we should conceive of these together as a single unified division of knowledge. After all, it might take the combined expertise of a physicist and a musician to produce a new musical instrument but this could not possibly constitute a good argument for the academic unity of physics and music. Unless GOUDIE and DOUGLAS are willing to take their arguments further and demonstrate that there are good reasons for supposing "that the fragmentation of geography into two discrete sub-disciplines would be prejudicial to its con-

tinued existence and vitality" (GOUDIE, 1986, p.458), the most they will have done is to point to a temporary unity of purpose. Having failed to tackle the problem of epistemological division, they make no contribution to our understanding of the academic unity of geography. The start of that debate must be the clarification of our conception of what proper or rational divisions of knowledge would be.

Having identified the starting point, we can begin to sketch the direction of future debate although the literature is singularly unhelpful here. Most geographers who have thought about epistemological problems have been concerned to argue for a particular epistemology or philosophy (GREGORY, 1978; SAYER, 1984). Only one collection of essays (GOULD and OLSSON, 1982) sets out with the explicit purpose of searching for common ground and even there the diversity of concerns means that no agreed approach to the search emerges. One approach (CHRISTENSEN, 1982) recognises the importance of clarifying the meanings of the terms we use to understand the nature of geography. 'Positivism' and 'humanism', for example, have been characterised in different ways by different writers. We must become more sensitive to these differences if we are to arrive at a more secure understanding of the nature of each and the relationships between them. Only then will the true extent of methodological division in modern geography become apparent. This will naturally lead the debate away from the practice of geography and into the realms of philosophy for we must then ask how the epistemological categories identified by JOHNSTON (1983) for human geography relate to the fundamentally opposed theories of knowledge which he claims underlie physical and human geography (JOHNSTON, 1986). How epistemologically distinct are positivism and structuralism and humanism? Could a methodologically diverse geography be underpinned by a unified epistemology? The direction the debate must take is clear. To understand geography better in order to judge whether 'geography' is a unified, coherent and rational division of knowledge, geographers will have to take a wider view than they have so far done.

An appreciation of this may already be present amongst human geographers for BUTTIMER and CLAVAL report that "Geographers have also begun to discover that they cannot ignore epistemological and ontological aspects of spatial study" (BUTTIMER and CLAVAL, 1987, p.222). The danger is that this process of philosophical reflection ignores physical geography and widens the gap between human and physical geographers. At a time when geographers in other countries (notably the Soviet Union) are recognising the value of examining the connections between a physical and an economic geography with histories of separate development, any disintegration would be premature. We must first investigate the grounds on which geography could claim to be a logical and rational division of knowledge, for it is only on such foundations that the academic unity of geography could be built.

APPENDIX

S o m e d e f i n i t i o n s

B e h a v i o u r a l g e o g r a p h y: a set of approaches to human geography which emphasise the importance of human behaviour in the creation of the human landscape and recognise human subjects as thinking beings. Topics covered include decision-making and choice, spatial learning and activity patterns in time and space. Behavioural geography is process-oriented with a particular concern for the cognitive processes of the individual. Whilst it grew out of a dissatisfaction with the mechanistic models of the 'new' quantitative geography of the early 1960s, it retains some of the scientific/analytic and quantitative character of that 'new' geography. It has been a widely influential movement within Anglo-American geography but some would argue that it has now run its course.

E m p i r i c i s m: a philosophical position which regards all knowledge as deriving from experience. In geography, it usually denotes a non-theoretical engagement with the 'facts' or objects of experience. This is thought by some to be naïve because it ignores the fundamental influence of theoretical frameworks in the identification of 'facts' (i.e. in our comprehension of experience).

E p i s t e m o l o g y: philosophical enquiry into what we can know and how we can know it. Also called theory of knowledge. In geography, different methodologies or approaches bear a complex relation to different epistemological positions. For example, both empiricism and positivism could be said to share the epistemological

assumption that we gain knowledge directly through experience, whereas structuralism posits underlying mechanisms which can be known but not themselves experienced.

H u m a n i s t i c g e o g r a p h y: a set of approaches based on broad humanist principles of sensitivity to the true nature of human beings (to what it is to be human). In geography this has resulted in a range of studies which focus on the understanding and experience of individuals in their environment. Originally a reaction against the excessively analytic and abstract nature of some positivist geography, humanistic geography employs a more literary approach in order to investigate the life-worlds of individuals and notions like 'a sense of place'. Some argue that it should be seen as a compliment to a positivist human geography, but others regard it as a replacement. Its influence in Anglo-American geography has been growing over the past decade, but it is still a minority interest.

O n t o l o g y: a central part of metaphysics which studies 'being' or 'existence'; i.e. the injury into what can be said to exist. Closely related to epistemology. Tangentially represented in geography in, for example, methodological debates about structuralism which assumes the existence of underlying structures.

P o s i t i v i s t g e o g r a p h y: a set of approaches identified with and developed from the 'new' geography of the early 1960s. Positivism is a doctrine associated with the 19th century philosopher AUGUSTE COMTE in which he insisted on the adoption of a scientific attitude to human affairs. Formalised and codified as logical positivism in the 1920s, positivism has come to be seen as underlying the application of scientific method within geography. The geography that can be described as spatial science or locational analysis has positivist roots. With its associated empiricism, positivist human geography has been seriously challenged over the last fifteen years by both humanistic and radical geographers.

R a d i c a l g e o g r a p h y: a movement which developed amongst human geographers in the 1970s when many had become disillusioned with the excessive abstraction and, some argued, irrelevance of spatial science/locational analysis (i.e. the 'new' quantitative geography). Most radical geographers adopt a Marxist standpoint and argue for a holistic and relevant social science and against the use of positivist scientific method in the study of human society. Because of their concern with Marxist economics, many radical geographers adopt structuralist approaches in their research. Radical geography is now well established as a significant movement within Anglo-American geography, although the Marxist viewpoint remains controversial and is not the dominant viewpoint amongst human geographers.

S t r u c t u r a l i s m: a set of principles originating in linguistics but applied more widely in the social sciences. In geography structuralism usually denotes a major critique of positivist geography in which empiricism is rejected for its naïve view of what can be known. The goal of structuralist approaches in human geography is to discover the deeper structures which are assumed to underlie appearances (our immediate experience) and which are the forces creating the social or human world.

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AN ANTI-RACIST APPROACH TO HUMAN GEOGRAPHY

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Human geographers have a long-standing interest in cultural diversity but, for an adequate account of cultural difference, it is necessary to make a successful crossing of a boundary in order to put the observer in a position where she or he can faithfully reflect other world views. The case which I wish to argue in this paper is that geographers have generally failed to make the crossing, for a number of reasons connected with the historical development of the subject, and that a better understanding of cultural diversity requires greater emphasis on 'experience' and 'participation', coupled with a theoretical alignment with social anthropologists such as DOUGLAS (1975, 1978) and COHEN (1985). For these two, the symbolic significance of boundaries in mapping cultural diversity has been a central concern.

Rather than discuss culture in a general sense, I will focus on race and the problem of racism. Racism is an issue which is central to the problem of misrepresenting the life-worlds of black communities but an anti-racist perspective in human geography would have general implications for the subject. In the first part of the paper, there is an attempt to define racism. This is followed by instances of racist thought as they are manifested in geography and, finally, I suggest a theoretical and methodological re-orientation

which would help to make human geography anti-racist and, more generally, produce less-distorted accounts of other cultures.

RACISM

Racism is a problem, primarily, for the white majorities in societies which have a legacy of colonial involvement with the Third World or which practice internal colonialism. The first category includes Britain, Holland, the United States and France and the second the United States, Canada and Australia. In all these states, as WALLERSTEIN (1983, p.101) put it:

'Historical capitalism developed an ideological framework which had never previously existed... oppression in the form of sexism and racism'.

In order to justify low rewards for labour, the workforce is stratified according to false claims about inferiority which are based on imputed racial characteristics. In ex-colonial powers, like Britain and Holland, we are concerned principally with black minorities who are the former residents of colonial territories and their descendants, whereas, in Australia, for example, the problem concerns the exploitation of the indigenous Australian population by the white majority in an internal colonial relationship. While racism may be a 'post-hoc' rationalization of economic exploitation, it is the ideological aspects with which we need to be concerned - the rhetoric, the language and the underlying, but unstated, values. The essential feature of racism, as JACKSON (1985, p.89) recognizes, is its recourse to the idea that differences between groups are innate, inherent or biologically inheritable.

'Racism...requires the view that 'cultural traits' are pathological and that inferiority is an immutable property of particular social groups rather than a social construct developing out of particular historical processes.'

Among academics and political activists in Britain, there is considerable disagreement about who is subject to racism. A

restricted view, relating to a particular interpretation of colonial history, is that only black people, primarily those of Afro-Caribbean or Asian origin, can be the victims of racism, whereas a broader perspective which is consistent with JACKSON's definition, would include 'white' populations, such as Jews, Gypsies and, historically, the Irish.

RACISM AND HUMAN GEOGRAPHY

A popular view, to which many academic geographers probably subscribe, is that racism as a social problem is restricted to extremist political organizations like the National Front and similar fascist parties in Britain or that it was a problem in the 19th century but is of no more than historical interest. Within modern British geography, there has been almost no reference to racism (but see JACKSON, 1987). I would argue, however, that we need to recognize racism as a serious issue for the subject, particularly because its manifestations are less obvious than they were in some 19th century academic writing (LIVINGSTONE, D., 1984). In examining changing ideas on racial and cultural difference since the 19th century, five particular arguments can be recognized as racist and all have informed geographical thinking at different times. They concern the questions of:

1. biological inferiority,
2. cultural inferiority,
3. invisibility
4. colour blindness and
5. 'black' as a problem.

1. Biological inferiority

Ideas about the biological inferiority of other peoples appear in Social Darwinist writing in the 19th century. The application of DARWIN's evolutionary thesis on the long-term effects of inter-species competition to human populations led to the conclusion that some races were closer to nature

than others (lower down the evolutionary ladder) and that some, those farthest from nature, were more fit to survive. The biologist, HAECKEL, for example, maintained that 'the careful rooting out of weeds among good and useful plants would make easier the struggle for life among the better portions of mankind' (BILLIG, 1982, pp. 70-71), a sentiment which received approval from Engels and Lenin, among others, and clearly provided a rationale for genocide. The Darwinian argument appeared also in the writing of the American environmentalist, Frederick OLMSTEAD, who maintained that:

'The power of scenery to affect men is, in a large way, proportionate to the degree of their civilization...Among a thousand savages there will be a much smaller number who will show the least sign of being so affected than among a thousand persons taken from a civilized community. This is only one of the many channels in which a similar distinction between civilized and savage men is to be generally observed. The whole body of the susceptibilities of civilized men, and with their susceptibilities their powers, are on the whole enlarged.' (OLMSTEAD, 1865).

To come up to date, one element of modern stereotypes of indigenous minorities, which is perpetuated in academic writing, is that they were close to nature in the past but, because industrial capital has disrupted their traditional, land-based economies, their only hope is to be assimilated into industrial society. This argument devalues their culture and seriously underestimates their capacity to adapt to changes resulting from the expansion of capitalism. This view harks back to 19th century racist ideology and has potentially damaging consequences for the indigenous population (SIBLEY, 1986).

2. *Cultural inferiority*

As the previous discussion suggests, the biological and the cultural merge. From spurious rankings of racial groups on the basis of assumed biological traits, it follows inevitably in the racist mythology that those ranked lowest

- nearer to nature - have no culture, as OLMSTEAD suggested. They are seen as empty vessels to be filled with modern values, which is the essence of modernization theory. This readily translates into the familiar geographical centre-periphery concept which, in the modernizing version, suggests that

'the outward spread of cultural influences from the centre will make communities on the periphery less like their former selves - indeed, will dissipate their distinctive cultures - and will turn them, instead, into small-scale versions of the centre itself. These culturally imperialistic influences will move outwards along the tracks of the mass media, of mass information, of spreading infrastructure, of mass production, national marketing and consumerism, ushering in a monolithic urban culture which will transform behaviour...' (COHEN, 1985, p.36).

This, COHEN refers to as 'myth of inevitable conformity.' In human geography, this perspective underpins a number of 'rural-urban transition' studies and studies of cultural diffusion. In the latter, the *meaning* of the diffusing idea or artefact for the receiving society is assumed to be the same as in the zone of origin, largely because physical analogues have been used to describe diffusion processes (COFFEY, 1981, pp. 177-178) and the significance of economic power and culture have not been recognized.

3. *Invisibility*

One interesting feature of the acquisition of knowledge about society is that some aspects of social reality are invisible to the researcher, even though there are written records or knowledge is otherwise accessible, through field work, for example (THRIFT, 1985). What is seen and what is not seen is affected by ideology - racist ideology restricts access to black or other minority cultures which are only partially represented in academic analysis. This is particularly evident in history where the contribution of black people to social movements, scientific progress or cultural change is unacknowledged. In British labour

history, for example, the work of William CUFFAY, a black tailor who was a leading member of the Chartist movement in the 19th century is unacknowledged and the contribution of Mary SEACOLE to nursing in the 19th century has only recently been recognized, alongside that white British Victorian heroine, Florence NIGHTINGALE. These omissions have a parallel in a sexist view of history, for example, the complete failure of male historians to recognize the contribution of women to the 1915 Glasgow Rent Strike. A similar instance of racism by omission is the work on ethnic groups in 19th century Liverpool which makes no reference to the black community which was well-established by the 1870s (POOLEY, 1977).

4. Colour blindness

Connected with this ideological blinkering is a failure to recognize race as an issue in social geography. Consider the following extract from a paper on residential migration in Rotterdam (AMENT and van der KNAPP, 1985, p. 1204):

'Another source of variation in migration behaviour can be found in differences in cultural background. In the Netherlands, this is clearly the case with immigrants from Suriname, from the Dutch Antilles, and foreign workers from the Mediterranean countries who entered the country in the past decade...The migration behaviour of these groups is likely to be different from the migration behaviour of the autochthonous groups. For example, they mostly live in the older city parts, they tend to inhabit smaller houses with more people and they usually belong to the lower income groups.'

There is no hint that the housing 'choices' of black communities in Rotterdam are affected by institutional racism, particularly in the public sector, in the allocation practices of the city housing department. The same authors go on to identify three ethnic categories, 1) Dutchmen (sic) 2) foreign workers from Mediterranean countries and immigrants from Suriname and the Dutch Antilles and 3) other

foreigners. By including the black population in a broad category with no particular racial or ethnic identity, the question of racism is effectively by-passed. Also, the use of the term 'ethnic' rather than 'racial' makes the problems of community relations appear less acute. As WALLMAN (1978, p. 215) has recognized:

'...a boundary now called 'racial' is (or is perceived to be) fixed, immutable, hard; and a boundary called 'ethnic' must be (or be perceived to be) softer, more malleable, fuzzier by contrast.'

The implication is that an ethnic minority is more likely to be able to exercise choice in the housing market than a racial minority. The barriers encountered by a black minority are not recognized because racism is not recognized as an issue in social geography.

5. 'Black' as a problem

In the light of the previous comment, it may appear paradoxical that the observation that concentrations of black minority populations constitute a problem is also racist. However, it is consistent with the attitude that such concentrations *should not* exist. Such a comment tends not to be coupled with an analysis of racism nor are the benefits of spatial concentration for the minority, in terms of mutual support, thresholds for the provision of community services, and so on, appreciated. To give two examples from geography:

HARTSHORNE (1938, p. 276) referred to '...the permanent problems of racial minorities in the United States' and went on to suggest that

'...no amount of education can change into white Americans the descendents of the negroes who arrived in Virginia before the Pilgrims landed at Plymouth, just as no beauty shop can make a fullblood negro (sic) look like a white person.'

It is clear from the context of this quotation that this was a matter of regret for HARTSHORNE. Similarly, MORRILL

(1965, p. 240) argued that

'...to the minority person, the ghetto implies a rejection, a stamp of inferiority, which stifles ambition and initiative. The very fact of residential segregation reinforces other forms of discrimination by preventing the normal contacts through which prejudice may gradually be overcome.'

Predictably, his prescription for change involved the creation of dispersed clusters of 'minority' housing - 'This makes possible easy contact within the minority group but also good opportunity for interaction with the white group, while minimizing the frequency of direct neighbours which few whites are, as yet, able to accept.' Such a prescription has been translated into practice in Rotterdam, where the city council is pursuing a policy of 'clustered deconcentration' for the Black Surinamese and Caribbean populations (MIK, 1983). I would argue that these are instances of what SOLOMOS (1984, p. 9, cited by WILLIAMS, 1985) terms 'the construction of black communities as problems.' KANTROWITZ (1981, p. 54) similarly, criticizes academics for creating a negative view of ethnic segregation and ignoring the positive aspects of segregation, as experienced by members of segregated communities. This negativism is an element of what COHEN (1985, p. 36) calls 'the myth of inevitable conformity' which is rooted in those consensus models of society, such as Talcott PARSONS' structural functionalist model, which effectively rationalize the domination and exploitation of minorities.

THE ELEMENTS OF AN ANTI-RACIST APPROACH TO HUMAN GEOGRAPHY

There are several approaches to the study of society which could be combined in human geography to counteract racist tendencies. If geography is anti-racist, it should generally provide a sympathetic account of the human conditions so it is not something which is only relevant to the question of race. Combating racism would be but one of its objectives, albeit an important one. The necessary

theoretical approaches already exist but they rarely come together in specific analyses. What I would suggest we need is an authentic account of the *structuring* of society in space which encompasses global and local scales, combined with a theoretical understanding of *relationships* between groups which focuses on the maintenance of boundaries and the social construction of reality within different cultures. In regard to race, the problem of structuring refers to the economic and political processes which have operated historically to exploit the labour of black populations; the relational problem concerns the question of stereotyping and the inability of outsiders to interpret the world views of minorities. The two elements of racism are linked in that stereotyping is a feature of exploitation - it dehumanizes the subject group which can then be treated simply as labour power.

THE GLOBAL QUESTION

A convincing account of the global problem is provided by WALLERSTEIN (1979) whose world systems theory is a history of the exploitation of space under capitalism. His analysis of the dynamics of core-periphery relationships, involving shifts in the combination of factors of production at a world scale, puts into perspective a number of apparently disparate problems, such as:

The extermination of the indigenous Arawak population in the Caribbean after Spanish colonization (because land and mineral resources were initially valued more highly than labour by mercantile capitalism); the end of the slave trade (because of changes in the relative cost of reproducing slave and non-slave labour, combined with the emergence of new avenues for investment of profits from the slave trade); the emergence of black internal colonies or ghettos in core states (because of the rising costs of white labour in the core and the historical processes of exploitation in the periphery). WALLERSTEIN's arguments are well-documented (WALLERSTEIN, 1979; TAYLOR, 1985a) and will not be repeated

here but they are significant in that they provide a context for understanding community relations in core countries.

WORLD VIEWS AND BOUNDARIES

While superficial differences between groups in society can be obvious, marked, for example, by language or skin colour, differences in world view are more elusive. That is to say, different group interpretations of reality may not be seen, often because behaviour expressing a difference in world view is stigmatized as deviant and in need of correction. From this labelling, there may follow a move to exclude the group from mainstream society. Implicit in the term 'deviance' is the idea that there is only one valid world view, that of the dominant group so the cultural boundaries between groups are not seen to exist. The minority, however, may be very conscious of boundaries. Consider, for example, the reaction of a native North American (Dene) to a planned settlement in Northern Canada (BERGER, 1977):

'Look at the housing where the transient government staff live. And look at the housing where the Indian people live. Look at how the school and hotel, the Royal Canadian Mounted Police and government staff houses are right in the centre of the town, dividing the Indian people into two sides...Do you think this is the way the Indian people chose to have this community?'

In this quotation, there is a clear consciousness of boundaries and of the alien nature of an environment - identified here by symbols of social control - which fails to accommodate the world view of the Dene. One difficulty for someone looking at a minority group from a dominant perspective is that, in industrialized societies, material provision assumes greater similarity in all communities and mass communication masks difference. However, while the structural basis of boundaries may become blurred, the symbolic significance of boundaries does not necessarily diminish and consciousness of boundaries can be important for cultural survival. In human geography, therefore, we need to focus on the symbolic boundaries sepa-

rating communities, asking questions about their construction and maintenance. Specifically, we might consider:

1. boundary strength, including the degree of consensus about the existence and function of boundaries.
2. the relative importance of external and internal boundary-maintaining processes.
3. transformations resulting from boundary crossing.

The importance of boundary strength has been recognized by Mary DOUGLAS (1978) in both traditional and modern societies, particularly in relation to the maintenance of internal homogeneity. With strong boundaries, there is an urge to expel dissidents. Perceived difference threatens the integrity of the group, whether witches in Salem, Massachusetts, in the 17th century, or Bangladeshis in the east end of London in the late 20th century. Conversely, weakly bounded and more diverse social groupings will be less conscious of difference and more tolerant. Basil BERNSTEIN (1971) produced a typology which is very useful as a starting point for an analysis of boundaries, where he distinguishes between social groups, institutions, social spaces, etc. according to *classification* and *frame* strength. There are four hypothetical structures, as follows:

CLASSIFICATION

	Strong	weak
strong	strong boundary, internal order, homogeneous categories	boundary with outside blurred, internal order, homogeneous categories.
weak	strong boundary, internal disorder, heterogeneous categories	boundary with outside blurred, internal disorder heterogeneous categories

Of these, strong boundaries with internal order and homogeneity (strong C and F) would be applicable to a collectivity which perceives minorities as non-conforming and deviant and attempts to expel them, the maintaining boundary strength, with a clear distinction between 'us' and 'them'. In such a situation, the stereotyping and distancing of the minority would be predictable. Strong C and weak F could be characteristic of a minority Gemeinschaft community, like Gypsies, where social life is highly integrated (thus, heterogeneous categories) but the urge to survive dictates that the external boundary is strong. Weak C and F would typify a collectivity which tolerated diversity and which lacked centralized and hierarchical forms of government to impose uniformity, such as a commune based on anarchist principles. The fourth hypothetical case, weak C and strong F, may not apply to existing forms of social organization.

In regard to the problem of racism, such a typology is clearly useful because of its relevance to stereotyping, group cohesiveness, contrasting world views, and so on. It is also a very general classification, however, which could help in understanding a wide range of social and spatial problems.

TRANSFORMATIONS

Once a diversity of world views is identified, it is more easily appreciated that material objects and ideas do not retain their initial symbolic significance when they are adopted by different cultures. This is central to the critique of modernization theory which is underlain by a racist ideology in that it assumes a transition from traditional (-) to modern (+) for a community which is in receipt of the cultural symbols of industrialized society. The adopted elements of modern culture are assumed to transform the minority culture rather than the minority attaching its own symbolic significance to elements of the dominant culture.

To give an example, in English Gypsy communities it has been noted that the musical traditions of European Gypsies, particularly the *Boyash*, whose music has been incorporated into the classical repertoire by composers such as DVORÁK, KODÁLY and BARTÓK, have been lost. These traditional forms have been replaced, apparently, by American and British popular music, suggesting assimilation into mass culture. However, it is clear that folk heroes, like Elvis PRESLEY, and Country and Western performers have been assimilated into Gypsy culture to the extent that children have been named after them. This practice of taking names from mass culture has been continued with the naming of children after darts and snooker players seen on television, as well as a fabric conditioner (Lenor). This does not happen in the larger society and the distinctive Gypsy interpretation of mass culture serves to reaffirm group identity rather than weaken it. Similar transformations have been observed in the interpretation of Catholic religion by the Indian peoples in Bolivia and Peru, where Catholicism is effectively incorporated into Indian cosmology. COHEN (1985) gives many more examples from both industrialized and peasant societies. An awareness of the possibility of cultural transformations is essential if we are to avoid racist and ethnocentric accounts of cultural difference. Such awareness presumes that we are conscious of other world views and the boundary processes which maintain them.

METHODOLOGICAL IMPLICATIONS

For geographers, boundaries are lines on maps. The symbolic boundaries discussed here may be invisible, part of the hidden knowledge which is inaccessible because the observer is unable to get outside the dominant categorical system. How, then, do we observe the invisible? It is clearly necessary to enter other life-worlds but this requires immersion in other cultures which may be best accomplished through participant observation. This is easy to prescribe but difficult to practice (JACKSON, 1983) and, as a method of en-

quiry, it does not fit easily into a subject where most academic effort involves the rapid analysis of aggregated data. The need for participation is suggested by the fact that most of the theoretical ideas discussed here come from social anthropology, where participant observation is the usual method of information gathering. At least, we should accept that longer term, possibly smaller scale, studies are necessary in cultural geography.

Beyond the methods, the epistemology which recommends itself in an anti-racist geography is symbolic interactionism where, according to ROCK (1979, p. 61)

'valid knowledge is held to reside neither in the subject nor in the object but in the transactions that unfold between them... It represents the emerging product of active encounters between consciousness and the materials which consciousness surveys... There can be many truths and many realities, each rooted in a knowing-known transaction; each secure in its time and place; each contingent on purposes, context and experience.'

Within human geography there are some hopeful signs, coming primarily from humanist approaches to the subject, that this view of knowledge is accepted as valid. Thus, at a broad theoretical level, structuration theory (GIDDENS, 1979) has stimulated a debate on the roles of structure and agency in social action. The capacity of social groups to mould their worlds is not admitted by some Marxists (see EYLES, 1987) but it can be argued that the structuring of human activity and the adaptation and transformation of structures through human agency are quite compatible. If the potency of human agents is acknowledged, the devaluation of other cultures is less likely. Hopefully, humanists would not subscribe to the myth of inevitable conformity.

Research involving participant observation, while still untypical in geography, has been carried out by some individuals working with racial minorities. This includes LEY's research on Black youth in Philadelphia (LEY, 1974), JACKSON on Puerto Ricans in New York (JACKSON, 1980) and SIBLEY (1981) on British Gypsies. Because of the financial and time con-

straints on research workers in Britain it is unlikely that projects like these will be much more frequent in future. However, in a multi-racial society, it is possible to participate in the activities of minority groups less formally, for example, through involvement in community and political organizations, and this could provide a greater insight into other world views than formal research.

One criticism of the interactionist approach to understanding, coming from theoretical Marxism, is that it creates a false consciousness, a diminished awareness of the conditions which determine people's lives but, as ROCK (1979, p. 66) argues 'the only false consciousness recognized by the interactionists is the contemplation of an alienated mind which retires to a place of distant reflection.' The point of bringing together structural analyses such as that of WALLERSTEIN and reflexive, interactionist analysis, is that we give due weight to structure and agency and do not create false oppositions.

CONCLUSION

In Britain, geography became a part of the university curriculum, at Oxford University, at the end of the 19th century when the country was pre-eminent as a colonial power. Subjects like geography were much concerned with describing the condition of subject peoples and their environments, information which was important for colonial administration and control and for the expansion of markets. TAYLOR (1985b, p. 99) has recognized a similar conjunction of interests in imperial Germany: 'Geography was potentially useful for both commercial and military reasons in a world of imperial rivalry.' Thus, not surprisingly, accounts of cultural difference were exploitative and racist and I would suggest that human geography has not changed very much in this respect - negative views of other cultures are projected in many studies of racial segregation and cultural change. In part, this results from the use of inappropriate research methods adopted in pursuit of a mythical objectivity. The more in-

timate approaches of social anthropologists which, evidently, have produced some of the most sympathetic accounts of other cultures (see, for example, BRODY, 1981) could be used profitably by geographers. This will not make human geography anti-racist overnight because academics themselves need to engage in a long-term programme of learning and unlearning in order to free themselves from unconscious racism, but it would be a start. At the same time, the theoretical debate needs to be complemented by grass-roots research involving other cultures in the construction of their own geographies.

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THE PLACE OF CULTURE IN HUMAN GEOGRAPHY

M.C. CLEARY

INTRODUCTION

In recent years a series of changes in the scope and methodology of human geography have occurred in Britain and the United States and, to a lesser extent, in other Western European nations, as the dominance of the spatial science paradigm in geographical teaching and research has been challenged by developments within the subject. Radical and Marxist geography, work in the behavioural sciences, and the growth of a humanistic geography have led to a re-interpretation of the nature of geographical research. It is to that broad school of cultural challenges to the orthodoxy of a geometric, quantitative and prescriptive human geography that this paper will address itself. It seeks first, to trace the historical place of culture in human geography, second to consider its reemergence in the subject in recent years and third, to examine an agenda of possible research topics which might restore culture to its central place in human geography.

Initially it may be useful to ask what is meant by 'culture'. As WILLIAMS (1976) has noted, culture is one of the most difficult words in the English language to define. He points out that it can refer to a process (the tending of some-

thing), to a particular way of life, or to a pattern of intellectual and artistic activity. It is with the more recent meaning of the word, the way of life of distinctive groups and the expressions of those groups through literature, the arts and the media generally, that cultural geography is concerned. But as COSGROVE (1983) has emphasised, to attempt a precise definition of the term 'implies its reduction to an objective category, denying its essential subjectivity' for its meaning has varied from one period to another, from one human society to another. It is possible to indicate two general themes: first, culture as human labour in the transformation of the earth through agriculture, viticulture, industry and so forth and, secondly, culture as *consciousness* - the non-material ideals and beliefs of human groups. Both of these broad themes, the first with its emphasis on material culture, in particular the landscape, the second with a focus on literature, painting and the arts as expressive of distinctive human beliefs have been important in the early development and more recent reemergence of cultural geography.

CULTURE IN TRADITIONAL HUMAN GEOGRAPHY

In the early development of human geography the importance of culture was paramount. The French school of *la géographie humaine* as epitomised in the work of VIDAL de la BLACHE and his disciples - JUILLARD, SORRE, MEYNER, MARRES for example - saw the task of the geographer as interpretation, largely through the regional monograph, of the link between the human group and the landscape, between *pays* and *paysan* (BUTTNER, 1978; HARRISON CHURCH, 1957). The relationship between the natural environment - the *milieu externe* and human attitudes and activities - *civilisation* - was viewed as central in human geography leading to the development of the idea of *possibilism*. In humanising the environment man humanised himself (GREGORY, 1981). It was the landscape itself that was considered as especially revealing of this man-nature relationship with the geographers' task being

the description and interpretation of the impress of culture, of that humanising activity, on the landscape. Studies of agricultural methods, of the material fabric of house, field and region, of the distribution and impact of religious, ethnic and linguistic groups were to form a central part of French regional geography. An emphasis on culture and, as CLAVAL has stressed, a strong historical element and sense of the past, were to characterise the French tradition until the early 1950s (CLAVAL, 1984).

A similar tradition was evident in the German school. There the idea of the *Kulturlandschaft* was an important component of geographical work promoting examinations of the relationship between different cultures and their impress on the landscape. The development and continued importance of the 'landscape indicator' school in German geography indicates this stress on the landscape as a unique record of the activities of different cultures.

Perhaps the strongest exponent of these approaches in the English-speaking world was Carl SAUER (for an introduction see LEIGHLY ed, 1963; Selected Essays, 1981). Two particular elements were central to his work and to that of the loose school of cultural geographers he trained from Berkeley, California. First was a strong emphasis on landscape - its physical base, distribution, and cultural underpinnings. For SAUER, culture was the agent, the natural area the medium, and the cultural landscape the result. Second was an awareness of the importance of an historical approach in human geography - the part played by human cultures, acting over time through modifying both habit and habitat, in creating the cultural landscape. Culture, then was of central importance to human geography - as SAUER wrote in 1925; ('Foreword. to Historical Geography' - In: LEIGHLY ed, 1963. p. 359.)

'The whole task of human geography...is nothing less than the comparative study of areally localized cultures, whether or not we call the descriptive content the cultural landscape.'

The powerful influence exerted by SAUER has been well described elsewhere (WILLIAMS, 1983) but it was crucial to the development of cultural geography in the United States and of historical geography in Great Britain. In the States, many of SAUER's students turned to studies in cultural geography which focussed on the landscape as the key to unravelling the changing role of human cultures through time. The works in the Prentice-Hall *'Foundations of Cultural Geography'* begun in the mid-1960s typify both the strengths and limitations of the tradition. These works - on the geography of house type and farm, of religion and language sought to place cultural factors at the centre of geographical enquiry (see for example: RAPOPORT, 1971; SOPHER, 1967).

The development of historical geography in Britain also owed much to SAUER's influence. The strong emphasis on the landscape which dominated the subject under the influence of H.C. DARBY can in part be traced back to the stress placed by SAUER on the historical aspect of human geography. Geographical studies of the changing landscapes of Britain and Europe with their emphasis on the interrelationship of cultural groups with the natural environment - studies which essentially created the field of historical geography in this country - owe much to the work of SAUER. Whilst current preoccupations in historical geography have inevitably shifted, the emphasis on the links between landscape and culture has remained (DARBY ed 1973; for developments in historical geography see the annual reviews published in *POGRESS IN HUMAN GEOGRAPHY* since 1977).

What kind of work then, resulted from this tradition of cultural geography? Studies of the impact of human cultures on the landscape were first, obvious tradition. Work which ranged from SAUER's study of the Caribbean at the time of the Spanish conquest to DARBY's reconstruction of the English landscape at the time of Domesday to studies of the idea of sequent occupance in the American Mid-West emphasise the diversity of the tradition and the difficulty of typecasting the cultural geographic approach (DARBY,

1977; SAUER, 1966; MIKESELL, 1975). Secondly, cultural geographers have consistently sought to direct attention to the importance of non-material phenomena. Thus, in work by SOPHER, Yi-Fu TUAN or LOWENTHAL the importance of attitudes and beliefs (intrinsically non-economic phenomenon) is examined in order to ensure a proper appreciation of such factors in geographical work (LOWENTHAL and BOWDEN, 1975). Third, a body of work has been devoted to the regionalisation of human cultures - towards the identification of distinctive culture areas or regions, usually based on the possession of distinctive culture traits, at both the national and international scale (see for example: JORDAN, 1983; SPENCER and THOMAS, 1973; WAGNER and MIKESELL eds 1962).

THE RISE OF SPATIAL SCIENCE

The development in the 1950s and 1960s of a geometrically based spatial science in human geography led to the demise of cultural geography in its traditional sense. The precepts of spatial science have been summarised by JOHNSTON, 1983). Its fundamental premise was that the task of the geographer was to produce a set of rational, statistically based generalisations, usually in the form of laws or models, to explain the spatial distribution of social and economic phenomenon. Employing models which had often been developed many years earlier (the agricultural land use model of Von THÜNEN, central place theory as developed by CHRISTALLER) the new generation of human geographers sought the creation of a rational, objective and scientific discipline using the scientific paradigm as a model and the burgeoning statistical and computational methods of the period as tools.

The legacy of this 'quantitative revolution' was enormous and, indeed, continues to be of importance. The geographical discipline was transformed by a new generation of practitioners whose outlook, methodology and research results revolutionised the discipline. A strongly applied character typified much of this work - the new spatial science went

hand in hand with the widespread expansion of state planning and the closer links between government planning bodies and the academic community. The task of the human geographer was increasingly seen as the development of sound, scientifically-based generalisations which could be used by the planning community to direct economic and social change. Both the methodological basis of the subject and its international standing were irrevocably altered by these developments.

During this period of unprecedented expansion in the subject, the place of culture and cultural geography suffered. This is not surprising for the work of cultural geographers tended to stress the individuality and uniqueness of particular cultures and their impact on the landscape and society of different places. Cultural geography tended to be non-statistical and regional; laws and models, the new *Leitmotiv* of the spatial scientist, sat uneasily in the repertoire of the cultural geographer.

Cultural geography did not disappear in this period but rather contracted to a few areas of the subject. In the United States, it was largely the work of the Berkeley school in California which maintained the tradition. The work of C. GLACKEN, tracing the place of nature and culture in western thought was published in 1967; WHEATELY's study of the Chinese city appeared in 1971; Yi-Fu TUAN's exploration of the attitudes and beliefs of different cultural groups began in this period. The expansion of interest in area studies in the United States in the 1960s also helped to keep the tradition of cultural geography active though, in general, the stress on cultural individuality conflicted with the dominant view that laws and models could be used to explain diverse cultures and societies and to argue that the same, essentially economic motivations, governed such groups.

In Britain, cultural geography, already rather weakly developed in comparison with the United States, tended to be the preserve of the historical geographer. Despite appeals by BAKER for historical geographers to use the past

as a laboratory to test out the spatial models of the new geography, most work by historical geographers continued to emphasise the distinctiveness and individuality of particular societies and cultures (BAKER ed 1971; PRINCE, 1971). Whilst not averse to using the techniques of the spatial scientist, the dominant emphasis was on uniqueness rather than generalisation and the field of landscape studies remained a powerful refuge for those human geographers either unwilling or unable to adapt to the new, quantitative *Zeitgeist*.

THE REEMERGENCE OF CULTURE

The development of spatial science in the 1960s and 1970s brought about the most widespread shift in the character and, it can be argued, the status of human geography in the history of the discipline. But not all the development of that period were seen as universally positive. By the early 1970s a series of challenges - some more powerful than others - were seeking to reorient the subject in various directions. Work by radical and Marxist geographers, behavioural geographers and, more especially, humanistic geographers aimed to both revise and replace the dominant paradigms in human geographers. As JOHNSTON (1983, p. 140) noted:

'By the 1970s, historical and cultural geographers had taken the initiative, and were proposing alternative philosophies to that of positivism, philosophies which were humanistic in orientation'. (See also JOHNSTON, 1986; GREGORY, 1978)

The starting-point for most recent work in humanistic geography has been a sense of disenchantment with the precepts of positivist geography. In particular a number of geographers have expressed dissatisfaction with the abstract reasoning and 'absence of man' in much of the spatial scientists' work. This intellectual critique of positivism has, according to DANIELS, been combined with a moral critique which argues that spatial science, with its powerful combination of science, technology and capitalism, denies the im-

portance of human agency and action in favour of a pre-ordained set of processes dictated by structural constraints (DANIELS, 1985). The close involvement of human geographers in planning, in devising strategies for development, in co-ordinating the exploitation of natural resources are developments which, humanistic geographers argue, should not be adopted unthinkingly by the subject. This is not, they argue, to suggest that these trends are unwelcome, but rather to point out that they may have been uncritically accepted as the central task of the subject.

The development of a humanistic geography has been accompanied by the reemergence of cultural considerations into the subject. This has occurred for a series of reasons. First, there has been an increased awareness of the importance of diversity in the geographical landscape, the reemergence, perhaps, of the old *exceptionalist* tradition in human geography. As JOHNSTON (1985, p. 330) notes a number of geographers now seek to promote a

'discipline which recognises and emphasises the variety of human responses to environment, space, place and people and which presents the world as a complex mosaic of different places, not as a series of examples of some models of behaviour'.

Second, DANIELS (1985) has emphasised the increased importance of using historical understanding to examine values and meaning, both concepts which are central to the work of the cultural geographer. Here one can identify a return to the historical approach in SAUER's work, the absence of which he lamented in American geography in the spatial science period. Thus, according to COLE HARRIS (1978) the rediscovery of what he terms a 'historical habit of mind' can benefit not only cultural and humanistic geography, but also studies of contemporary geographical distributions and processes. These two developments - an emphasis on diversity and on temporal evolution - seem sure to give cultural geography in some form a renewed importance in the subject.

CURRENT WORK IN CULTURAL GEOGRAPHY

Given the difficulties of defining 'culture' in precise fashion, it is not easy to classify recent developments in cultural geography but at least three, inter-connected trends can be identified: the continuing focus on place, on the landscape as a repository of cultural values, secondly, an increased attention to sources such as literature and painting as a means to understanding cultures in diverse periods and places, thirdly, an interest in examining culture as a mechanism for the reinforcement of power relations or hegemony in different societies. These three broad trends will now be examined in more detail.

The first area of research, and the most traditional, has focussed on the landscape as a primary source for understanding cultures. The oldest traditions of cultural geography, as has been shown, emphasised this approach. As ROWN-TREE (1986, p. 580) has recently pointed out in reviewing the field, 'the notion of the cultural landscape continues as an integrating theme...that links the subfield with dialogue on method and practice in allied disciplines'. Thus cultural geographers have continued to focus on the landscape as *material culture* through studies of vernacular or folk architecture, religious traits in the landscape or contrasting patterns of field and farm, town and village. A folk and rural bias in these works serves to illustrate the difficulties faced by cultural geographers in extending their work to the urban environment where cultural distinctiveness may appear less obvious than the countryside (MIKESELL, 1978; JACKSON and SMITH, 1984).

Recent work in cultural geography has emphasised, less the structural characteristics of the landscape itself (the patterns of house type, field and farm, village and hamlet) which was so central to earlier work, but has rather viewed place and the landscape as products of intentional human activity replete with meaning. HARVEY's examination (1979) of the construction and iconography of the Sacre Coeur in Paris thus sought to describe and interpret the 'meaning

of a landscape that was intended to mythologise the history it commemorates'. The connection between place and human meaning, a connection often absent from the sometimes repetitive studies of 'cultural indicators in the landscape' characteristic of earlier work is one of the more stimulating aspects of recent developments. COSGROVE's examination (1978, 1984) of the park landscapes of Northern Italy approaches the place-people relationship in a subtle manner, seeing the landscape as the product (both conscious and unconscious) of the power of its aristocratic owners. Thus, whilst the emphasis on cultural artefacts in the landscape remains an important part of the tradition, the subject is approached in a more subtle and refined manner presenting culture, not as the mechanistic agency of a given set of changes but rather as a fluid, ever-changing component which, depending on particular historical conditions, can mould distinctive and revealing landscapes.

The discovery that literature, painting and the arts generally could provide great scope for geographical work was one of the products of the disenchantment with positivism in the early 1970s. Much of the earliest work focussed on literature. Drawing on the work of R. WILLIAMS (1973), human geographers sought to examine literature as a source for identifying attitudes towards the landscape. Thus a whole series of papers have sought to examine the sense of place in the novels of D.H. LAWRENCE, George ELIOT, Mary WEBB or Thomas HARDY. Whilst some of these do little more than trawl the relevant works for references to landscape, the better ones - by BARRELL for example, have sought to relate the isolated literary work to the narrative conventions of the period (POCOCK ed, 1981). Furthermore, as BARRELL (1980) has shown, analysis of literature and painting cannot be achieved without relating the particular work to the power and class structures of the period. English landscape painting of the 17th and 18th centuries, for example, was stylised both in terms of artistic conventions and the social hierarchies evident in constructing particular landscapes. Know-

ledge of such stylistic conventions help the human geographer to appreciate that

'many eighteenth-century English landscape paintings are not so much tender-hearted renderings of an open countryside as tough-minded assertions of landed property' (DANIELS, 1985. p.150).

Work on maps - the cartographic expression of sets of power relations between individuals (estate maps), institutions (tithe maps) and powers (national atlases) have also proved a potent source of interest for the cultural geographer and highlighted the limitations of a geometrically-based approach. Many maps - both old and new - are evocations of power and place as much as topography (BLAKEMORE and HARLEY, 1980; KAIN and PRINCE, 1985).

Thirdly, a number of cultural geographers have sought to examine culture, not so much as a set of observable artefacts - the landscape, art, literature - but rather as part of a system of production which is central to access to and control of power or *hegemony* in different societies. In class society, notes COSGROVE (1983), culture is the product of class experience and cultural hegemony is the successful imposition of that culture produced out of the experience of the ruling class. As WILLIAMS (1977) emphasises, culture is as much a social product as work, food and shelter - 'production' and 'industry' cannot be isolated from the comparably material production of 'defence', 'welfare and 'cultural entertainment'. Thus the products of that culture (literature, the arts, ultimately, the landscape) can be viewed as central tools of class control.

Such an approach is illustrated in BILLINGE's study (1984) of the cultural geography of late 18th and early 19th century England. Viewing culture, not as superstructural (as it has been in much Marxist analysis) but as central to hegemony, BILLINGE analyses the changing power groups during the period and argues that the incorporation of the *nouveaux riches* into the aristocratic power group was facilitated by the development of a new culture based on distinctive scientific,

religious and political coalitions. Such an approach, argues BILLINGE (1984, p.67),

'emphasises not only economic determination, but also ideological persuasion and cultural cohesion in the development of social formation'.

It is perhaps in this area of work that the potential for developing a truly radical cultural geography will lie.

CONCLUSION

This paper has sought to trace the roots of cultural geography, its disappearance during the spatial science period of human geography and its reemergence in more recent years. It can be argued that culture should continue to play a central role in geography because of the attention that it focuses on human diversity and on the frailty implicit in overarching theories and models. As human geographers reinterpret their methodology - a process essential to the health of the discipline - the place of culture in its various forms and diverse definitions seems to be emerging once more into the core of the discipline. It is a development which should benefit both the research and teaching of the subject.

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THE EFFECTS OF A NATIONAL BORDER: HUMAN GEOGRAPHICAL APPROACHES

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INTRODUCTION

A national border is an imaginary line separating the territories of states from each other or from the open sea. While a national border represents the limit of state power, it is not only the line separating two states but a contact zone as well. The former British Foreign Secretary, Lord Curzon, said, '...Frontiers are indeed the razor's edge on which hang suspended the modern issues of war or peace, of life or death to nations' (POUNDS, 1963).

The role of the state border is not only important *within* international law, but, as a major spatial divide, it also influences the spatial organization of state productive forces, public administration and the settlement network (BUZA and HAJDÚ, 1961). Political borders have existed from ancient times and their significance has frequently been reevaluated. Nevertheless in numerous cases they have been a major source of conflict between two countries, confirming Curzon's claim.

Since borders appear in space and are closely related to the organization of space, they have for long been the concern of geographers. Any change in national borders will have an effect on societies involved and will especially impact on their infrastructural systems (communications networks, settlement network, etc.). The objective of this paper

is to elucidate the most characteristic effects of border changes on a settlement network, by considering a specific example. We are seeking to answer the question 'What effect did the border changes which took place as a consequence of the Trianon Peace Treaty in 1920 have on the settlement network, particularly along the frontiers, and structure of public administration in Hungary?'

THEORY AND BORDER AREAS

The development of productive forces is regionally uneven. This results in the formation of *cores* (more developed areas) and *peripheries* (backward areas) in economic space (TÓTH and CSATÁRI, 1983).

Renewal is much easier to investigate in those centres in favourable locations while the spread of innovation waves is also from cores to peripheries. Moreover, regional disparities increase as one moves from countries in central locations to those in more peripheral positions. The literature on core-periphery relationships in Hungary is fairly comprehensive, although, with some exceptions, the various approaches have focussed on the study of backward rural areas at the expense of areas located along the national or county borders whose social, economic, historical and ethnic implications have been neglected (BELUSZKY, 1976; ENYEDI, 1970; LACKÓ, 1975).

Authors agree that the categories core and periphery are relative concepts as the same element of economic space can function as periphery at one level and as core at another. Much greater disagreement may be observed in evaluating the relationship between border areas and peripheries.

Some authors believe that the border position is not synonymous with periphery from a socio-economic viewpoint (SÜLI-ZAKAR, 1987). Others accept that such a position does not automatically mean a peripheral character, although they regard it as more than accidental that the two terms often coincide (TÓTH and CSATÁRI, 1983).

In addition, none of the cited works properly underlines the individual nature of border areas. In turn individual methods and approaches are required in any study of border locations if the aim is to elaborate rational regional development policies for such areas.

Besides the general underdeveloped nature of border areas, it is our opinion that particular attention should be paid to the following:

- most of the national minorities are concentrated in these areas;
- the border runs along basin margins and stream valleys and, consequently, most of these areas have unfavourable natural endowments;
- the border separates areas that had previously developed as economic and social units and, as a consequence, their progress (or possible progress) depends not just on the decisions of one country but on political relations with neighbouring countries.

THE CONNECTION BETWEEN A NATIONAL BORDER AND THE SETTLEMENT NETWORK

It is a commonly held view that in many cases frontier areas do not offer sufficient potential energy or attraction for the development of settlements of major significance (regional centres). It is regarded as self-evident that, if a border runs in the close vicinity of a regional centre, its hinterland will be curtailed thus reducing the possibility of population expansion and further economic development. In the case of continental countries, communication nodes situated near to the border (mountain passes, gorges, river ferry sites, etc.) have proved to be much more favourable than the border areas themselves for the development of major cities. But it should not be assumed that concentrations of population or settlements with higher order functions cannot be established on national borders, since there are examples of this even in Europe, for instance Basel, Geneva, or Russe. But equally, owing to their excellent situation these towns would, in all probability, have expanded even further if a national border had not been situated close-by.

The effect of shifting a political border on urban development is well illustrated by the example of the two Hungarian cities, Debrecen and Szabadka, the latter now belonging to Yugoslavia. The positive example is that of Debrecen. In the 17th century, it was a border town situated close to the frontier between the Kingdom of Hungary, Transylvania and the area of Turkish occupation, and as a result was able to develop into a significant market town and the largest city in Hungary with 30,000 inhabitants. In terms of population, at the beginning of the 19th century, it was only surpassed by the city of Pest (Buda, Óbuda and Pest were unified in 1872) which was able to exploit a more favourable geographical location and thus experienced more dynamic growth.

At this time Szabadka (Subotica) was the third largest town in Hungary and remained so until the First World War. It had a large economic hinterland and was an important and busy communication centre. When, as a consequence of Trianon, it was ceded to Yugoslavia, its population exceeded that of Zagreb, Belgrade or Sarajevo; in other words, it was the largest city in Hungary's southern neighbour. However, the border was drawn in close proximity to Szabadka and the city thus acquired a peripheral position, even within Yugoslavia. As a result it has fallen behind in the population growth league having experienced no growth since 1910, and is now ranked fifteenth amongst Yugoslavian towns.

THE HUNGARIAN URBAN NETWORK BEFORE THE FIRST WORLD WAR

At the beginning of the 20th century Hungarian settlements could be divided functionally and structurally into two characteristic types, each showing a distinctive spatial distribution.

In the central region of the country, ie. in the Great Hungarian Plain, with its predominantly agricultural land use, large and well-populated villages were situated at considerable distances from each other and a network of country-towns developed. In contrast, in the mining-industrial regions

found close to the national border settlements were mostly small villages and hamlets with provincial towns of Western European type.

Overall the backwardness of the settlement network at this time is reflected in the fact that, although in 1910 a total of 156 towns of widely ranging size and functions were registered in the country, only 16.7% of the total population were town-dwellers.

THE HUNGARIAN URBAN NETWORK AFTER THE TRIANON PEACE TREATY

The disintegration of the Austro-Hungarian Monarchy following the First World War meant a natural decomposition of what had been an ethnically diverse state. By virtue of the agreements fixed in the peace treaty a new regional order was established in the Carpathian basin and the natural and socio-economic character of the country was fundamentally transformed. The altered state borders significantly reduced the size of the internal market and deprived heavy industry of most of its raw material resources (ENYEDI, 1978).

Hungary lost 71% of its territory and 64% of its population. The new border was established close to cities considered until that time to occupy a central position, for instance, Esztergom and Nagyvárad. It thus forced a complete re-evaluation of the potential energies of these cities and of their relationship to the rest of the truncated settlement network.

The disproportionate weight of Budapest in industry and services, resulting from rapid economic development after the Compromise with Austria, became intolerable. Budapest was built to be the capital of a country three times as large as present-day Hungary. The contrast was further increased by the fact that the potential counterpoles to Budapest, like Pozsony, Kassa, Kolozsvár, Nagyvárad, Temesvár, Szabadka and Zágráb, were handed over to other neighbours created from the break-up of the Austro-Hungarian Monarchy (*Fig. 1*).

The dominant position was further increased by the migration of people from border areas settled by Hungarians but

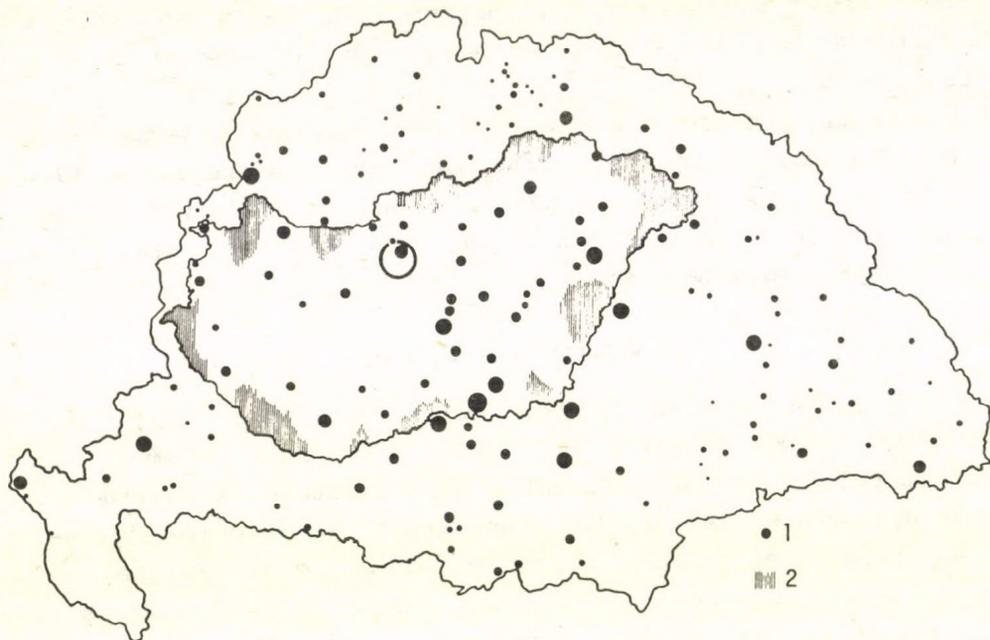


Fig. 1 The Urban network of Hungary before the World War I.
(Census of 1910)

1 = Towns; 2 = Areas without towns

which now lay outside the state borders - many of whom settled in the capital. As a result, the proportion of the urban population of Hungary living in Budapest increased from 22% in 1900 to 39% in 1920 (ZOVÁNYI, 1986). This extraordinary pattern of change hindered urbanization in the interwar period and even now is the source of severe problems.

It should be pointed out that the new national border did not respect the hierarchical evolution of the settlement network. Important towns, such as Nagyvárad, Komárom and Sopron, lost various parts of their zones of influence, while large areas eg. Bihar, Szatmár and Zemplén counties were left devoid of a significant urban centre. These processes also affected neighbouring countries.

CHANGES IN THE ZONES OF INFLUENCE ALONG THE BORDER

A reconstruction of the former zones of influence of the larger settlements is a difficult task owing to the absence of an appropriate data base for the period, although some studies have attempted this task. In this study we have attempted to construct a map of the historical zones of influence for an area 30 km in width on either side of the border (DÖVÉNYI, 1977; BÁCSKAI and NAGY, 1984).

In doing this we have not only taken into consideration the size of the population and the gravitational attraction of the retail trade but also the network of communications within administrative districts and the natural interactions within the settlement network which had evolved over time. The resultant map is based on data for 1910 (*Fig. 2*).

It can be seen from the map that there are only a few places where the new border conforms with the former urban hinterlands, with substantial areas detached from their nodes in some cases. This, of course, had serious economic consequences because, while administrative districts can be quickly re-aligned by central decree, the transformation of the settlement network is a much slower process taking many decades.

Among the urban centres left in Hungary, Szombathely, Sopron, Esztergom, Balassagyarmat, Sátoraljaújhely, Gyula and Szeged lost considerable parts of their hinterlands and Pécs, Nagykanizsa and Debrecen had to give up minor areas of their zones of influence. In most cases the subsequent development of these towns has been significantly retarded by this disruption of the settlement system. The rate of population growth of these towns has consequently fallen behind the national average in spite of large-scale immigration following the re-alignment of the national frontier.

However the manner in which the various centres adjusted to the changes in the border differed. There were some towns which, relieved of the competition of a larger centre due to the border change, increased their own spheres of influence and thus achieved a more rapid rate of development

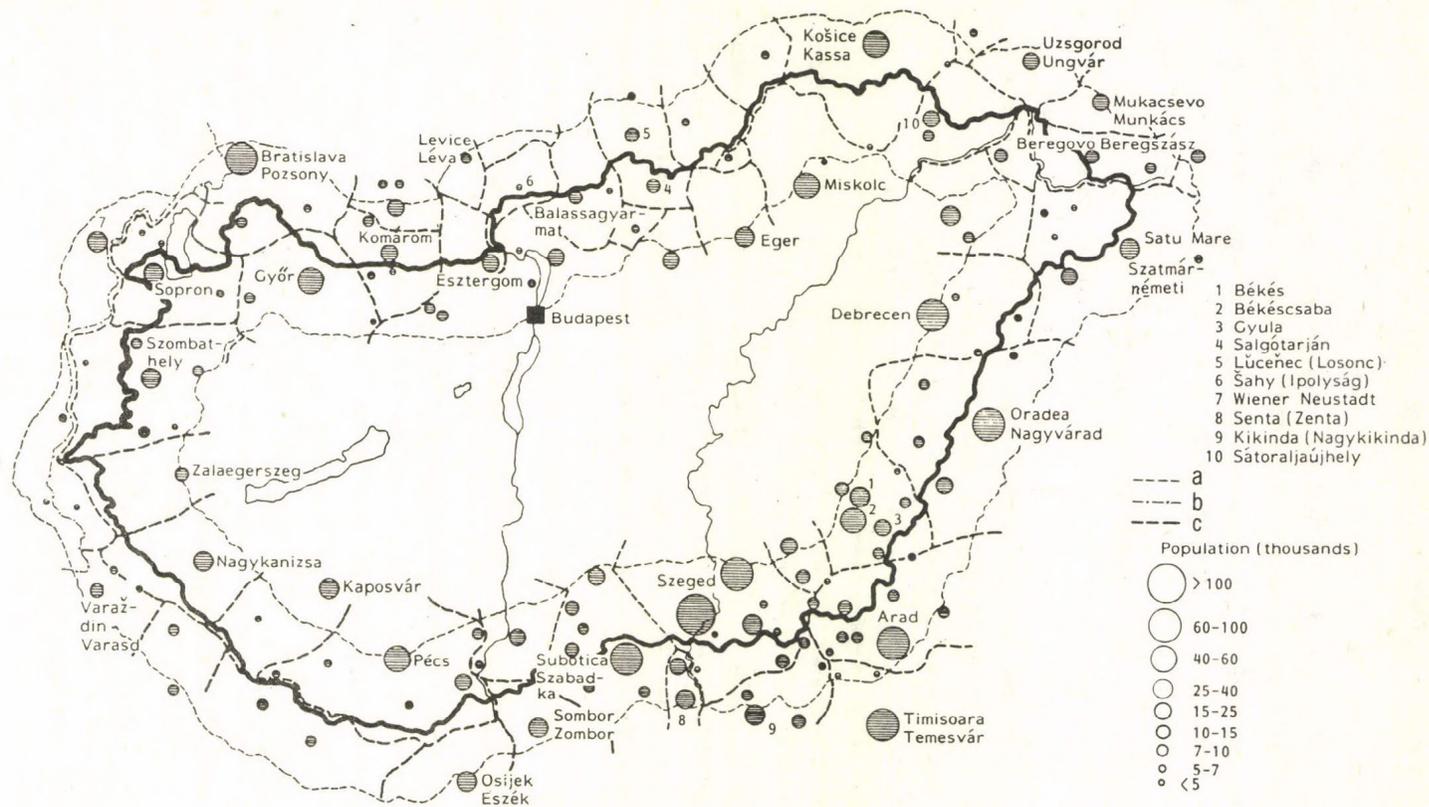


Fig. 2 Zones of influence along the border, 1910

a = boundary of 20 km border zone; b = historical state border; c = zone of influence
 Circle areas are proportional to population size.

than would otherwise have been the case, for instance Mosonmagyaróvár lost the competition of Pozsony, and Baja the competition of Szabadka. Considerable parts of the zones of influence of the cities of Kassa, Beregszász, Szatmárnémeti, Nagyvárad, Arad, Szabadka and Komárom, which were all annexed to neighbouring countries, were left in Hungary. For example, the new border removed the Cserehát Hills from the economic and administrative control of Kassa, the plain of Bereg from that of Beregszász and the plain of Szatmár from that of Szatmárnémeti. Since these areas contained only lower order settlements and no centres of any significant size, the border changes left them without a regional centre.

Smaller areas were removed from the zones of influence of Ipolyság, Zombor, Pozsony and Losonc, and added to those of nearby centres remaining within Hungary: Balassagyarmat, Baja, Mosonmagyaróvár, and Salgótarján. In the case of Komárom, Sátoraljaújhely and Szabadka, on the other hand, the new border actually ran through the town itself, separating some, albeit insignificant, parts from the main body of each town.

Neglecting for the moment the economic, political and ethnic consequences of the border changes which followed Trianon, it is clear that the Treaty was harmful and in some cases completely irrational from the point of view of settlement geography.

THE DEVELOPMENT OF THE HUNGARIAN URBAN NETWORK AFTER TRIANON WITH SPECIAL REFERENCE TO BORDER AREAS

1. Re-organization of local administration

Local administrative divisions and the spatial arrangement of the settlement network - particularly at lower levels of development - are closely interrelated. The hierarchical organisation of local administration is determined by the stage of development of urban centres as well as their spatial arrangement. At the same time, the system of local administration itself constitutes a powerful influence upon the formation of the spatial structure of the state, influencing and

shaping the functional and hierarchical system of the settlement network and the migration of population.

After Trianon, of the 63 counties making up Greater Hungary, only 10 were left entirely within the new national borders, 24 were divided into two or more parts, while 28 were attached to the successor countries (HAJDÚ, 1984).

From the former county of Ung only three villages were left in Hungary. On the other hand the overwhelming majority of the counties of Csongrád, Győr and Szabolcs remained within the mother country (*Fig. 3*).

The 'counties' left without a capital and the 'county capitals' left without a county continued to function. In the interests of the openly revisionist policy of the Horthy administration, the functioning of even the smallest truncated county was maintained by every means possible, though this was in direct contradiction to the serious economic situation of the country.

The re-organization of local administration was eventually carried out in 1923, when the truncated counties in the areas along the border which were too small to form coherent administrative units were temporarily united (eg. Szatmár, Bereg, Ugocsa). It was not until 1950, however, that a more satisfactory solution to the problems of local administration in these areas was found, involving the formation of 19 new counties as well as a number of more minor modifications. Among the county capitals designated at that time, there were some centres which had experienced some economic development after the First World War, for example Tatabánya and and Salgótarján.

One negative consequence of the 1950 administrative reform was that the backwardness of the border areas which were now administered from geographically remote county seats in, for instance, Nyíregyháza, Miskolc, or Kecskemét, increased.

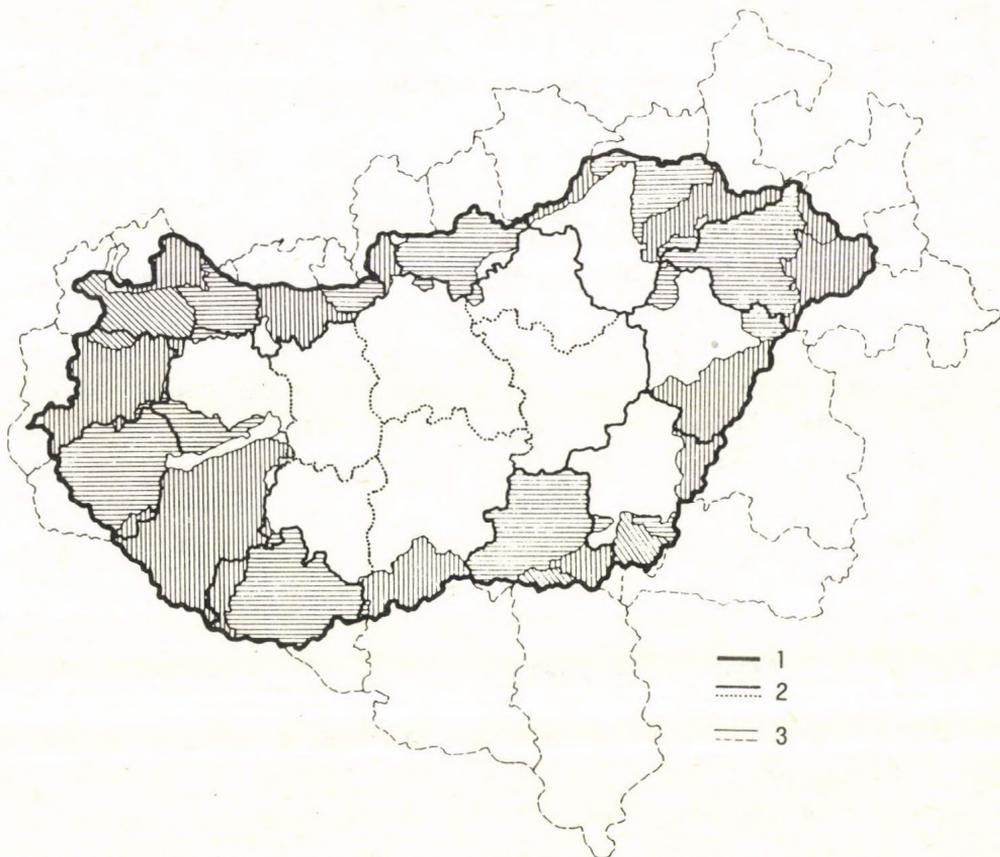


Fig. 3 Changes in local administrative areas after the Trianon Peace Treaty

1 = National border; 2 = County border after the war; 3 = County border before the war

2. *Natural and directed development of the settlement network along the border*

Phase 1 (the period between the two world wars)

Despite the six decades which have passed since the peace treaty, the negative effects of the border changes on the spatial pattern and settlement network of Hungary have not been eliminated. The economic decay of formerly prosperous

settlements encouraged the young, mobile section of the population to move towards the interior of the country, especially in the direction of the capital and the industrial centres which offered a better standard of living (COMPTON, 1971).

Between the world wars no comprehensive settlement development policy existed. This is clear from the fact that during the inter-war period only 5 new towns (Balassagyarmat, Békéscsaba, Mohács, Mosonmagyaróvár and Salgótarján) came into existence in the 30 km wide strip along the border (Fig.4).

After the Second World War Hungary acquired a more favourable geographical position as regards social-political life. Although the different stages of economic development in neighbouring countries hindered Hungary's own development, these new circumstances meant that, at least theoretically, the basis for a common, coordinated settlement policy could be laid down.

Phase 2 (after the Second World War)

During this period of development two major stages can be distinguished.

The first period, from 1945 to 1970, more or less coincides with an extensive economic boom in the country which also had an effect on the settlement network in the areas along the border. With the acceleration of socialist industrial development a number of new, 'socialist', industrial towns were developed including some in the border area, for instance, Ózd, Kazincbarcika and Oroszlány. In addition, other settlements already functioning as small towns before the Second World War, and strengthened thanks to industrial investment, increased their tertiary sector and were granted urban status - Kapuvár, Mátészalka and Sárospatak. Functionally the latter are better described as 'conventional towns', unlike their 'socialist' counterparts which have been fashioned around heavy industrial plants and the housing blocks built for their workers.

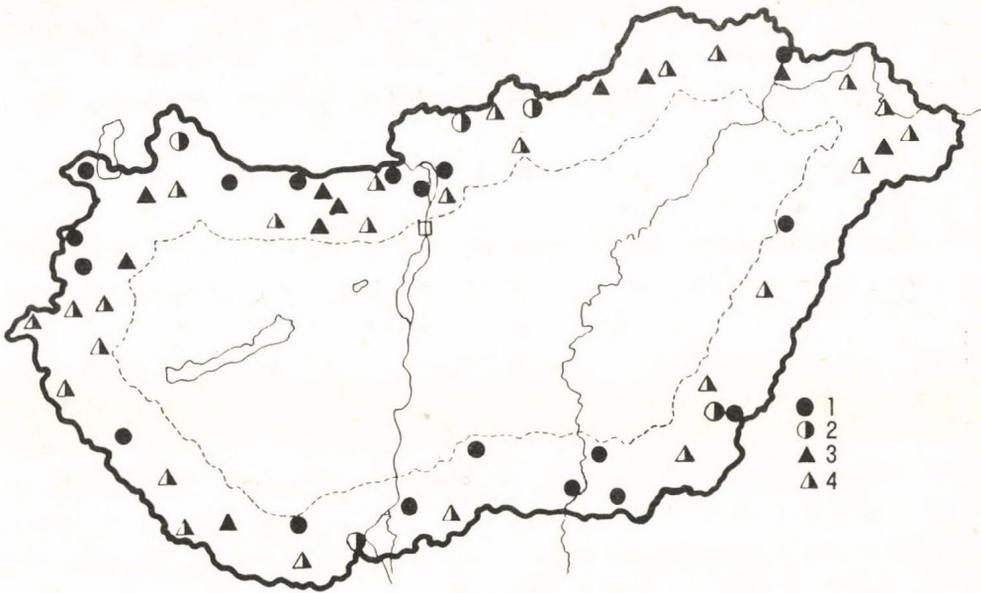


Fig. 4 Date of declaration of urban status in the border areas

- 1 = Before 1918; 2 = Between 1918-1945; 3 = Between 1945-1970;
 4 = After 1970

The second development period started in 1971 with the approval of the National Settlement Development Plan (OTK) in that year and brings us to the present. By specifying a strict sequence of ordering, this comprehensive development concept was applied to the entire country - including the areas along the border - and has resulted in the creation of a hierarchical settlement network. It also constitutes the framework within which any future development must take place.

As a consequence of the National Settlement Plan, 24 new towns have been created in the 30 km wide frontier strip since 1970, making a grand total of 58 towns in the area. In a narrower 20 km frontier strip, 39 towns can be found, of which 16 only have been designated towns since 1970.

Undoubtedly, in the case of some towns, urban status has been conferred in advance of substantial development

and occasionally a rather awkward amalgamation of villages, for instance Encs and Lenti, had to be performed to achieve this. But these new towns have eventually acquired certain central functions and have become prominent within their areas.

Other areas which had until then lacked any real central place were now drawn within the spheres of influence of larger towns or cities, such as the Cserehát region oriented towards Encs, the eastern part of the county of Szabolcs-Szatmár looking to Kisvárdá, Vásárosnamény and Fehérgyarmat and the region of the Dráva river which has come under the influence of Lenti, Barcs and Siklós. Another important characteristic of the period following 1970 is that a number of towns which had previously been in a state of stagnation now experienced some rejuvenation, for instance Sopron, Kőszeg, Esztergom, Sáropatak and Gyula, largely as a result of the boom in international tourism.

This upswing in the fortunes of these cities has not yet stopped. We can see, for example, that the life of Sopron, Kőszeg and Szentgotthárd and other towns along the Western border has been revived over the past few years as a result of visitors from Austria for shopping and health trips along with numerous other economic relationships and the income from these developments constitutes new development resources which have not yet been fully realised.

In addition, central government provides assistance to alleviate the problems of peripheral areas (mostly regions along the frontier) and according to a Parliamentary decision of 1985 a so-called 'programme of catching-up' is under preparation. On the strength of this a state support grant of several billion Forints will be allocated from the settlement development and organization fund to industrial and agricultural plants intending to invest in the designated areas. Such companies would also receive tax allowances and other benefits. It is only to be hoped that the favourable processes started about fifteen years ago will continue and that development of the settlement network along the border will not be interrupted (*Fig. 5*). While agreeing

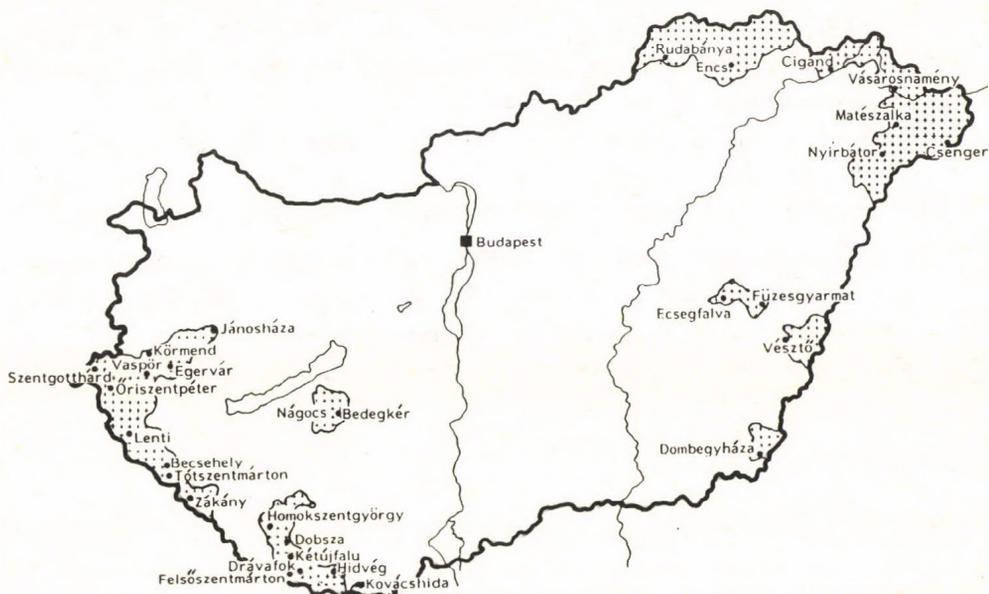


Fig. 5 Areas and settlements along the border in need of development

with the efforts of the government, we must express the reservation that they may not be successful in the long run. Sectoral efforts are insufficient to solve the problems of border areas, and it is not sensible to risk industrial investments in the era of restructuring.

CONCLUSION

The autonomous development of border areas of Hungary has been disrupted and directed along forced paths; these areas are mostly depressed regions, neglected both by researchers and regional development policy.

In itself a border location is not necessarily a disadvantage, and may even be advantageous in some cases, but there is still much to do in the way of research and planning in order to promote those factors favourable for the

living conditions of the local population of these areas, and for their development.

Our preliminary investigations have made it clear that the problems concerning the development of border areas may be formulated as two questions:

- how can these areas best be integrated into the economic life of the country and how can they participate more intensively in the regional division of labour?
- what are the opportunities for involving border areas in programmes of international integration that rely on cooperation with neighbouring countries?

These are questions that must be answered by the social and environmental sciences.

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APPLICATIONS OF GEOGRAPHICAL METHODS WITHIN BUSINESS MANAGEMENT

J.A. DAWSON

INTRODUCTION

One of the long-term strengths of geography as a discipline has been its synthetic nature. This has been apparent at both systematic and technical levels. Compared with many other disciplines geographers working in systematic areas have been willing to use concepts and approaches culled from a variety of other disciplines. Equally, geographers have borrowed techniques from other areas. Geography's critics often point to the variety of studies undertaken under the geographical umbrella and suggest this variety reduces depth and rigour of analysis. Other critics and self-critics bemoan the loss of core activities and see research increasingly as on the fringe - rather like the American city. To geographers, and geography's proponents, this variety gives strength to the discipline both by the broadening of intellectual horizons which it allows and by the opportunities it presents to apply methods and techniques from one area to solve problems in a different area. This width of the spectrum of activities allows application of geographical concepts and methods in a wide range of social, economic, political and environmental situations. The synthetic method itself thus becomes the core of geography and critics are confounded. Despite the potential for widespread applicability across many critical aspects of society there appear to

be preferred areas of application. These preferred areas partly reflect some long-standing traditions in applied geography but also indicate geographers' responses to key contemporary problems in society. The aim of this paper is to consider some geographical applications areas within business and management. As such, large areas of applied geography are not considered. The reason for the paper results from a growing awareness by the author that many geography graduates from British Higher Education establish careers within the corporate sector and, whilst not always claiming to be geographers and having job titles covering the total business spectrum from marketing, through finance, distribution, information systems to human resource management, apply the knowledge and skills they have obtained as geographers.

APPLICATIONS IN PRIVATE AND PUBLIC SECTORS

Historically, it is perhaps from the urban and economic geography base that most applications have stemmed and these have been dominated by applications within the government sector. The applications in various aspects of land use management - urban, rural, environmental, recreational, etc.- have generally had public policy agencies as their contractors. The use of geography to aid the decisions on the appropriateness or otherwise of particular land uses generally has been carried out by public sector agencies. Geographers have been less involved in private sector decisions of these types, at least until relatively recently. Similarly in regional development programmes where the synthetic skills of geographers have been particularly useful in assessing the effects and effectiveness of interacting investment decisions, in the majority of cases these applications have been in a public agency context whether regional government, national government or multi-national governmental agency. The overt geographical applications, for the most part, have been associated with public sector activity yet many thousands of professionally trained geographers have taken up positions in the private sector. In many cases these individuals are covertly using their geographical skills to solve private

sector problems within large and small firms. The aim of this paper is to suggest that there are an increasing number of applications areas for geographical concepts and techniques in the business management area. Geographical applications in the private sector, however, require from geographers different methods of working and a different perceptual construction of 'applied geography' compared with work for government agencies. It is further argued that the maturity of 'applied geography' will only occur when overt geographical applications in the corporate sector become as commonplace as those in the public sector.

Some basic differences between public sector and private sector management underpin the need to adapt geographical methods to the two sectors of the economy. The key optimising function in public sector management is welfare rather than profit and the key constraint in the public sector is value for money whilst for the private sector the constraint is social externalities. In the one case the social objectives are tempered by financial constraints whilst in the other financial objectives are tempered by social constraints. Whilst this something of an oversimplification and exceptions can be found nonetheless it is broadly true in terms of managerial ethos. In general, geographers, at least in the United Kingdom, have felt more comfortable with applications in topics with social rather than financial objectives. This is clearly seen in the books and papers which review major applications areas in British geography and in the recent attempt by the Institute of British Geographers to review research underway by its members. It is also reflected in the teaching syllabuses of geography degrees where financial considerations to land-use management and environmental change are given little consideration.

In recent years there has been, nonetheless, an increase in geographical applications in the corporate sector. Geographers have begun to move from passive study and analysis of the firm to a more active influence in the decision making of the firm. *Fig. 1* serves to define the firm from managerial perspective. Traditionally, the geographer has been concerned with analysis of the environment and to a lesser extent the

OPERATIONAL ENVIRONMENT

THE ECONOMY

LEGISLATION

TECHNOLOGY

SOCIAL ATTITUDES

PHYSICAL FACTORS

CORE MARKETS

CUSTOMER MARKET - customers and potential customers

OWNERSHIP MARKET - finance and shareholders

SUPPLY MARKET - physical assets, supplies, etc.

LABOUR MARKET - workers

CORE MANAGEMENT ACTIVITIES

MANAGEMENT - provides direction for the business

CONTROL - includes planning, scheduling, monitoring,
reporting

ADMINISTRATION - provides systems to support the organisa-
tion

CORE FUNCTIONS

BUY - acquisition of materials and resources for use in busi-
ness

MAKE - changing the state of materials and adding value

SELL - disposal of materials and enhanced resources

Fig. 1 A managerial view of the firm

markets in which the firm operates. Increasingly, geographical expertise is being used within decision making both within the core functions and integral to core management activities. There are a number of characteristics of decision making in the firm with which geographers, coming from a public

sector tradition, have had to come to terms. Four are illustrative of the *differences* between public and private sector decision taking. The four are:

1. the need for rapid solutions,
2. the willingness to accept sufficient solutions,
3. the need for implementable solutions,
4. the requirement for solutions which differentiate firms from each other.

In all these cases it is assumed that geographical work, in a similar way to business management, is placed within a problem-solving/decision-making paradigm.

APPLICATIONS IN PROBLEM SOLVING

Although there are alternative views of the relationship between problem solving and decision making for the purpose of this paper it is assumed that decision making is part of the larger process of problem solving. The geographer's contribution can be in any of the various stages of problem solving within business management. *Fig. 2* provides one model of the decision making cycle which passes through a sequence (COOKE and SLACK, 1984; MOORE and THOMAS, 1976):

observe
formal recognition
interpretation/diagnosis
definition
set objectives
determine options
evaluate options
select option
implement
monitor via observation

Within this total sequence of problem solving, decision making involves the partial sequence from definition to option selection. In general the sequence follows the activities in the list. There are occasions when recycling occurs and some feedback occurs to interrupt the general sequence. The two main *reasons for recycling* or backtracking within this problem solving sequence are:

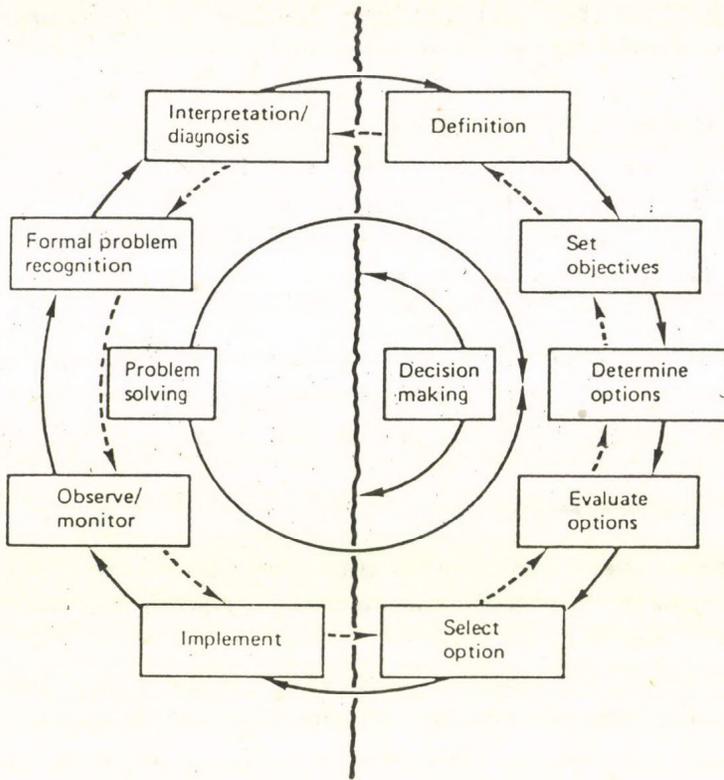


Fig. 2 The Decision Cycle (COOKE and SLACK, 1984)

1. comprehension recycles when additional information is needed in order for a stage to be completed and to allow the process to continue. The decision maker backtracks in order to understand better the complexity of an issue
2. failure recycles in which some stage has not achieved what it set out to do and has to be repeated.

Table 1 illustrates some possible reasons for specific recycle activity. The problem solving paradigm within business management usually follows the modular and rather deductive model outlined above. Whilst a deductive approach may well characterise public policy decision making there is, in many instances, use of a model in which the objectives are not

Table 1 Possible reasons for recycling the decision-making process
(COOKE and SLACK, 1984)

Cycling		
From	To	Possible reason
Select	Evaluate	Evaluation against further criteria required
Select	Determine options	None of options meets selection requirement
Select	Set objectives	Questioning feasibility of objectives
Select	Definition	Doubts as to whether any of options will solve real problem
Evaluate	Determine options	New set of options thrown up during evaluation
Evaluate	Set objectives	Objectives in insufficient detail to allow evaluation
Evaluate	Definition	Evaluation discovers attributes of options outside definition of decision
Determine options	Set objectives	Check to see if possible option feasible within objectives
Determine options	Definition	Option discovered which seems attractive but is outside decision boundary
Set objectives	Definition	Realistic objectives wider than decision boundary allows

clearly set but induced and in which structuralist relationships are implied to inter-connect many of the discreet stages of the cycle in *Fig. 2*. Thus, some would argue that the definition of the problem can affect directly how it is observed.

Problem definition as undertaken by a geographer is likely to stress inter-dependencies and interactions and defined in these terms the perception of the problems will be different compared with a definition using more rigorously bounded concepts, for example, as may result from a training in pure science. Within the *various stages of the cycle* portrayed in *Fig. 1*, managers are required to balance and interpret several inter-dependent variables. Thus, for example, in a cycle involving a decision of whether to enter a new market, perhaps in a foreign country, the stages may involve the following:

observe: an intuitive feeling that an opportunity exists in a new market, perhaps the result of a chance meeting, or of something read or seen. Usually there follows a period of waiting with the inter-relating of diverse places of information. Usually little overt action is taken by the individual. The wider the individual's perceptual set the more likely that this adventitious stage will take place. For example consciousness of a change in the social structure of women in a third world country might trigger an idea for a new market for a product.

formal recognition: after a period of accumulation of evidence the point is reached when the need for a decision becomes real. This is essentially the result of an inductive process. A trigger point is reached at which some action has to be undertaken. This might be a change in current markets which means a new market has to be found.

interpretation/diagnosis: until this point the decision process is responsive to various stimuli. At this stage an inductive approach changes to a deductive one and diagnosis of the issue begins. The perception of the nature of the issue or problem is heavily conditioned by the individual's

perception set and ability to consider inter-dependencies in the system. Thus in the example of a new third world market, awareness of the cultural, social and political inter-dependencies would be important in establishing initial feasibility.

definition: this stage changes the interpretation into an operational form. The most important activity here is to draw boundaries around the issue, for example to decide which countries of the world are to be considered as potential markets.

set objectives: during this stage it is necessary to establish what it is hoped the decision will achieve. Several objectives may be set and it is necessary to understand the potential interactions amongst objectives. Determining objectives is a complex process with the interplay of corporate objectives, the personal objectives of management and the objectives of shareholders and other groups. In major decisions these objectives may be in conflict, for example in decisions on plant relocation which can affect the lifestyles of the managers making the decision. Some of the geographical techniques of conflict resolution can be of use in this context but seemingly more important at this stage is the need to establish clear, consistent and agreed objectives. In the export example the reasons for seeking a new market, expectations and its relationship with existing markets would be set.

determine options: the complexity of this stage relates to the breadth of the decision boundaries. A broadly defined decision will have a range of options which requires to be considered.

evaluate options: this is often difficult to separate from the previous stage. This stage involves establishing the extent to which each alternative option meets the decision objectives. This can be achieved by qualitative and quantitative analyses, the latter often utilising probabilistic analyses of likely outcomes. Option evaluation is a critical stage in the decision process and involves evaluation of:

1. resource requirements to implement the option,
2. the compatibility of the option with other activities not directly under review,
3. the option's financial consequences,
4. the degrees of risk in the options and extent to which particular options open or close off other courses of action.

Whilst quantitative evaluation models may be used there is also scope for softer qualitative approaches. Environmental forecasting is often used at this stage, as illustrated in *Fig. 3*, and again the geographer's training across a wide range of topics and in synthetic skills is clearly of value. The evaluation stage often means a review and assessment of work over a wide range of subjects.

The exporting example would involve the specific evaluation of markets in particular countries. This would involve consideration of the range of social, economic and environment variables which might affect market entry, penetration and establishment.

select option: the outcome of this stage depends on whether a single decision maker is involved or whether a group decision making body is involved. Three issues are important at this stage. First is the way the decision maker compares the evaluated options, secondly the way in which the process of making the choice is managed, and thirdly is the need for decision makers to be aware of the whole decision process.

implement: this depends largely on the skill of management to make the decision operationable and the systems which are in place to allow actions to occur.

monitor: the final stage is the monitoring of the decision to establish how effective it has been in achieving the desired objectives.

The decision-making cycle is at the heart of a major part of business management. It has been considered in some detail here because of its importance and because the geographical method has contributions to make at various stages. The decision cycle, however, despite its several stages, often

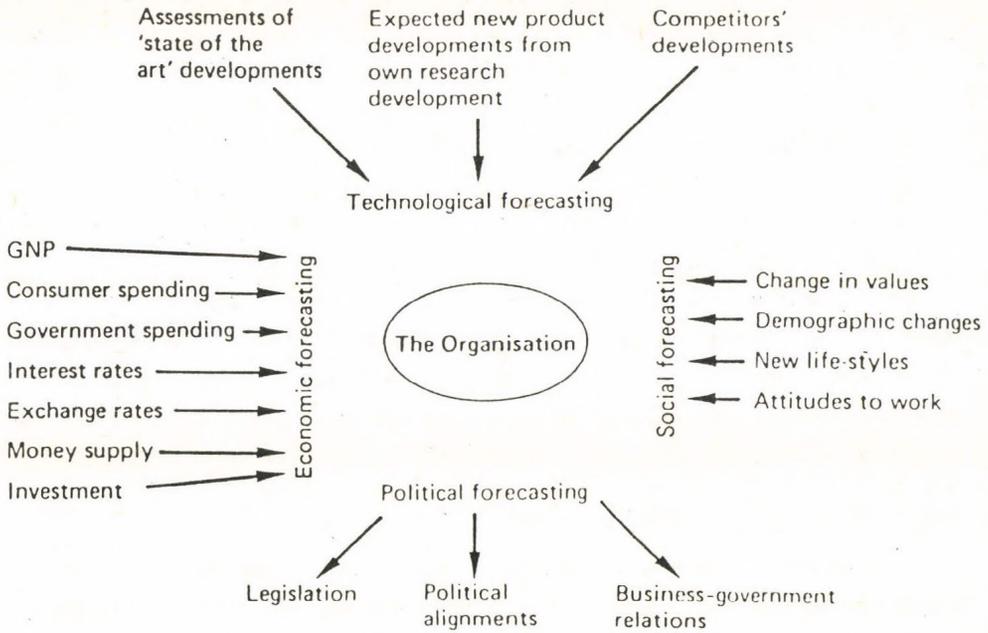


Fig. 3 Scope of Environmental Forecasting

has to occur rapidly and perhaps with a team of people working within the process. Rapid decisions are commonplace, yet some stages, such as option evaluation, are complex. Geographers involved in the process have to come to terms with the rapidity of the decision process. This may occur through the management development programmes of geographers employed in the firm. Alternatively for professional geographers interacting with firms, it requires awareness and commitment to produce solutions rapidly and to define the boundaries of issues in a tighter fashion than might be the case with work of a non-applied nature. The importance of decisions which are implementable is also considerable. The need to consider behavioural variables, therefore, is as important as consideration of normative analyses. Again for geographers in an academic environment this involves a trade-off in order to allow their work to be applicable. Finally, the requirement for firms to differentiate themselves from each other in order to succeed in the market results in the need for non-

generic or at least bespoke solutions to problems. Often this means tailoring solutions to the particular culture of the firm. This can sometimes pose problems for researchers with a more traditional academic approach to problem solving.

Within the core management process of the decision cycle, a training in the geographical method, particularly its outward-looking character and its synthetic skills, can be useful. This is not to argue that geographers can move into general management positions without acquiring managerial skills and methods, but it does suggest that a basic geographical training can be an advantageous base from which either, from a personal viewpoint, to launch a managerial career or, from a corporate viewpoint, to develop effective managers.

APPLICATIONS WITH BUSINESS FUNCTIONS

Whilst the general geographical method can be of use in general management, there are also some more specific applications of geography within more specialist business functions. Plant location is one of the more obvious areas in which geographical methods are of use and have been used. Multi-plant firms who seek the cost economies of replication frequently have functional sections of the firm responsible for unit location. These multi-plant firms are most likely to be in sectors where final consumer demand is satisfied, for example financial services, retailing of goods, personal services, etc. The location divisions of major retailers often employ professional geographers who utilise their spatial analytical skills. Safeway, Dayton Hudson and Weingarten in the USA, Tesco, Argyll and Burtons in the UK, are retailers with such groups. All contain geographers and several are directed by geographers. DAVIES and ROGERS (1984) and WRIGLEY (1988) illustrate the techniques now in widespread use. The involvement in the professional societies of geographers working in these functional areas is relatively limited although growing, notably in the Applied Geography Speciality Group of the AAG. Whilst the flow of expertise has been from higher education to the corporate sector, through recruitment and employment of geographers working in location research, there

has been relatively little counter-flow of expertise into academic geography from these professional geographers. This must be a matter of concern to the national geographical societies.

Geographical skills are not limited to the analysis of locational problems within the firm. Problem associated with the flows within the multi-locational firm are amenable to the techniques of spatial analysis. These flows may be of materials and products (physical distribution) or of less tangible items such as information or money. In all cases, however, the spatial structure of the nodes in the network affects the flows, with changes in node patterns changing the flows. The effects on physical distribution in a super-market group of the opening of a new store can be considerable. Directions and volumes of flows over the system are affected as the new store is assimilated into the total structure. The management of the system when new stores are added every month or so requires sophisticated spatial analytical optimising methods - but ones which produce solutions quickly and in a form which allows implementation within the constraints of the particular firm. This is a far from trivial research task yet it must be operated within a pragmatic managerial context. Certainly geographical methods have much to offer in such a case, but it may not be the geographical purist's view of problem-solving - data may be noisy, random events can cause major disruptions and real time solutions may be necessary to problems such as vehicle failure.

Other fields where particular skills of the geographer are directly applicable are in market assessment and in export marketing. In these areas the skills of post-analytical synthesis - or shuffling the playing cards in a different order - which is the essence of 'geographical' method, are important but equally important is knowledge of different societies. Realisation of the types of variables critical to defining a nation's social structure is inherent in much geographical educations, certainly at degree level. The translation of this knowledge into the commercial world of export marketing can be relatively easy from a geographer's base but perhaps more difficult in some other cases.

Table 2 shows the types of information needed for market assessment for a consumer product in an export market. Although a geographical training will not provide the information *per se* it is likely to make easier its interpretation and evaluation. If couched in the decision cycle model outlined above then the evaluation of options may become deeper and more thorough.

In much of the corporate sector the managerial view of space is naïve. Awareness and response to temporal dimensions to business are much stronger and well developed than response to spatial issues. This is changing, perhaps even due to the increasing number of geographers involved in management, but still has a long way to go. There are numerous examples of bad locational decisions, poor assessment of 'foreign' business environments and naïve assumptions about the transferability of business practices from society to society. Perhaps some of the worst offenders in this respect are major multi-national companies who often find it difficult to temper resource allocation procedures on a global scale with the nuances of local social and cultural conditions. British attempts to enter the Japanese market not infrequently fail because of a lack of understanding of Japanese culture, but early Japanese inward investment into Scotland also posed problems before Japanese management came to terms with the attitudes of Scottish workers.

APPLICATION OF SPECIFIC TECHNIQUES

Implicit in comments so far has been the view that there are some specific analytical techniques in geography which can be used directly in various business functions. *Information representation* is a major area of these specific techniques. Originally simply mapping methods, the range of techniques has expanded to the whole area of Geographical Information Systems. Image processing, analysis of geo-coded data, and graphical representation are three key areas within GIS in which business applications are increasing.

Table 1 Checklist of cultural variables in consumer behaviour

Determine Relevant Motivations in the Culture:

What needs are fulfilled with this product in the minds of members of the culture? How are these needs presently fulfilled? Do members of this culture readily recognize these needs?

Determine Characteristic Behaviour Patterns:

What patterns are characteristic of purchasing behaviour? What forms of division of labour exist within the family structure? How frequently are products of this type purchased? What size packages are normally purchased? Do any of these characteristic behaviours conflict with behaviour expected for this product? How strongly ingrained are the behaviour patterns that conflict with those needed for distribution of this product?

Determine What Broad Cultural Values are Relevant to This Product:

Are there strong values about work, morality, religion, family relations, and so on, that relate to this product? Does this product connote attributes that are in conflict with these cultural values? Can conflicts with values be avoided by changing the product? Are there positive values in this culture with which the product might be identified?

Determine Characteristic Forms of Decision Making:

Do members of the culture display a studied approach of decisions concerning innovations or an impulsive approach? What is the form of the decision process? Upon what information sources do members of the culture rely? Do members of the culture tend to be rigid or flexible in the acceptance of new ideas? What criteria do they use in evaluating alternatives?

Evaluate Promotion Methods Appropriate to the Culture:

What role does advertising occupy in the culture? What themes, words, or illustrations are taboo? What language problems exist in present markets that cannot be translated into this culture? What types of salesmen are accepted by members of the culture? Are such salesmen available?

Determine Appropriate Institutions for This Product in the Minds of Consumers:

What types of retailers and intermediary institutions are available? What services do these institutions offer that are expected by the consumer? What alternatives are available for obtaining services needed for the product but not offered by existing institutions? How are various types of retailers regarded by consumers? Will changes in the distribution structure be readily accepted?

A second broad area of geographical methods which is increasingly widely used in business is *interaction models*. This includes diffusion models and distance decay modelling for market penetration studies and more generally models of the impact of a new facility on the existing pattern of provision. In this latter case there are now numerous case studies of the impact of shopping centre proposals and newly completed schemes on surrounding retail provision. The models used in these case studies are essentially geographical.

A third group of geographical techniques with direct application is those of *regionalisation* and the parcelling of space. Firms frequently have a regional administrative structure which has to change as the firm changes. Regionalisation becomes important to the firm as administrative costs vary with alternative regionalisations of the firm.

CONCLUSIONS

It has been argued that within business management there are aspects of the general geographical method which are of use in basic decision making in the firm. Within the more specialist functions of the firm there is again applicability of the geographical method based on synthesising skills. There are also more specific techniques and skills in geography which have direct applicability within a variety of business planning, marketing and strategic development activities of the firm. Firms operating in a multi-plant environment have greater use for geographical techniques, simply because the friction of space represents a greater cost element in these firms than in a single plant firm. With the growing corporatisation in many western countries large multi-plant firms are increasing in economic power. This is most clearly, although not exclusively, seen in industry sectors satisfying final demand. We might expect therefore the application of geographical methods to become more widespread and more important in the economic systems of the future.

Whilst much of the application of geography within business management is covert, there is increasing recognition of both the value of a geographical education as a basis for management and of the specific value of some geographical methods. Many geographers within the private sector, however, are still establishing geography's credentials much as happened in the application of geography in the public sector in the 1950s. As covert applications grow and geography's utility becomes established, so there is more likelihood of geography emerging as a managerial profession. At the same time, western economies are moving into a post industrial stage when more complex multi-locational organisations become more powerful. Awareness of the opportunities and constraints imposed by space will increase in these more complex firms and applications of spatial analytical techniques will grow in importance.

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UNIVERSITY GEOGRAPHY IN BRITAIN AND HUNGARY

P.A. COMPTON

The aim of this paper is to present a brief comparative overview of contemporary geography within the university systems of Britain and Hungary. The focus is more upon the the organisation of the subject - student numbers, syllabuses, the structure of research - than upon the professional work of geographers; it begins with a summary of the development of the subject at university level in the two countries. As far as information sources allow, the same ground is covered for both countries although this has not been always possible. Geography in higher education institutions other than universities - that is polytechnics, colleges of higher education and teacher training colleges in Britain and teacher training colleges in Hungary - is not covered in the paper.

THE DEVELOPMENT OF UNIVERSITY GEOGRAPHY

1. In Britain

The origins of geography, as it is recognised in Britain today, can be traced back to the foundation of the Royal Geographical Society in 1830. The first professor of geography, A. MACONCHIE, was appointed to University College London

in 1833. His was a personal chair however, and the recognition of geography as a university discipline only came after the Society commissioned J.S. KELTIE's report on 'The Improvement of Geographical Education' in 1886, which led directly to the appointment of Sir H. MACKINDER to a readership in the University of Oxford in 1886, and indirectly to the establishment of lectureships in geography at the Universities of Cambridge in 1887 and Manchester in 1892.

By the 1930s, geography had achieved a secure niche within the British university scene. Fittingly the first permanent chair of geography had been established at University College London in 1903 to be followed by other pioneering chairs at University College Reading, then part of the University of London, in 1907 and at Aberystwyth and Liverpool both in 1917. But it was the 12 year period 1920 to 1932 that was decisive in assuring the position of geography as a university discipline. These years saw the creation of 10 more permanent chairs of geography: at Birkbeck College London, Southampton, the London School of Economics and Political Science, Exeter, Manchester, Cambridge, Edinburgh, Sheffield, Oxford and Bristol, and the emergence of geography as a single subject (honours) course at university level. Moreover, as the discipline gained in confidence and the research writings of geographers began to proliferate, the need for a professional association and a new outlet for scholarly geographical publications led in 1932 to the establishment of the Institute of British Geographers, with its own journal, *The Transactions*.

It was on these foundations that geography was able to build in the decades following the Second World War. In no small measure, this was a product of the general expansion of the education system. The 1944 Education Act opened secondary education to all and was responsible for a dramatic increase in the number of secondary school pupils. The six-fold increase in the number of pupils matriculating with a geography 'A' level between 1951 and 1976, from 6,000 to 37,000, was particularly significant as it is from this group that university undergraduates are selected. Accordingly, the demand

for university geography courses also began to rise in the early 1950s and departments of geography began to expand their staff numbers to cater for this growing demand. Many of the new geography graduates entered the teaching profession, but opportunities also began to emerge in other areas of employment, for example, the civil service, local government administration, and town and country planning. In addition, the more talented students stayed on after graduation to undertake research for higher degrees and went on to find lecturing posts not only in the expanding geography departments of British universities, but also in the United States, Canada, Australia, New Zealand and other English-speaking countries.

The most dramatic phase of growth came after the publication of the Robbins Report in 1963, which argued for the general expansion of higher education through the creation of new universities as well as expansion of existing institutions. Geography shared fully in the growth that ensued. In nine of the newly founded universities, geography departments were established, although sometimes in the guise of schools of environmental or area studies, bringing the total number of university departments of geography to 43. In addition, geography is taught to degree level in 22 polytechnics and colleges. When the university and polytechnic sectors are considered together, this means that some 8-10,000 students are now reading for undergraduate degrees in geography in any given year.

This brief account of the development of the subject in Britain must, however, end on a somewhat pessimistic note. Higher education has not escaped the effects of economic restructuring and the level of government funding has been progressively reduced since 1981. Geography has shared in these difficulties and the immediate prospect is for further contraction, if only because of the anticipated demographic downturn after 1990. The stress now being placed on science and technology and the anticipated shift away from grant support to one of contract funding of the universities seem likely to intensify these trends.

2. In Hungary

University geography in Hungary is as long-established as in Britain. Indeed, the creation of the first formal geography department with an established chair dates back to 1870, that is 33 years earlier than the chair at University College London, with the appointment of János HUNFALVY to the Professorship of Geography in the University of Sciences and Arts of Budapest. Two years later in 1872, HUNFALVY was instrumental in setting up the Hungarian Geographical Society, with its own journal *Földrajzi Közlemények* (Geographical Journal) and was its first President until his death in 1880. Earlier HUNFALVY had worked with Karl RITTER and had become a member of the Hungarian Academy of Sciences in 1858.

After the death of HUNFALVY, the Chair in Budapest went to Lajos LÓCZY, who as well as being a geographer, was also a geologist, Alpinist and explorer and took part in the 1877 to 1880 Hungarian expedition to China and Mongolia led by Count Béla SZÉCHENYI. Accounts of this expedition figure prominently among his many publications as do works on the geology and hydrology of the Lake Balaton region. LÓCZY was a member of the Academy of Sciences, served as President of the Hungarian Geographical Society from 1900 until his retirement in 1914 and founded the Geographical Institute to further the exchange of geographical research.

The third figure to play a prominent rôle in the formation of geography in Hungary was Jenő CHOLNOKY. CHOLNOKY, like LÓCZY, was primarily a physical geographer and geologist. He too published material on his visits to China and on the Balaton region and also on climatology. His University career began as an assistant to LÓCZY in Budapest but in 1905 he was invited to the newly founded Chair of Physical Geography in the University of Kolozsvár, now Cluj-Napoca in Romania, the second department of geography to be established in Hungary. CHOLNOKY became a member of the Academy of Sciences in 1920 and was also President of the Hungarian Geographical Society and General Secretary of the Geological Society.

The break-up of Greater Hungary at the end of the First World war led to the reorganisation of the university system. The University of Kolozsvár was transferred to Szeged, that at Pozsony (Bratislava) to Pécs while a new university was established in Debrecen. All the universities in the country were now teaching geography and during the subsequent two decades the subject was dominated by two figures, CHOLNOKY and Count Pál TELEKI.

TELEKI was not only a geographer of international repute but also a leading European statesman during the 1920s and 1930s. He represented Hungary at the Versailles peace negotiations, was appointed to the position of Foreign Minister in 1920 and was Prime Minister at the time of his death in 1941. He began his geographical career as assistant to LÓCZY in Budapest, became Director of the Geographical Institute in 1909, was elected a member of the Academy of Sciences in 1913 and was invited to the Chair of Geography in the Economics Faculty of the University of Budapest in 1919. His interests in geography were wide-ranging and from among his many works one may pick out his History of Geographical Thought published in 1917, his Ethnographic Map of Hungary published in 1920, his book on the Economic Geography of America which appeared in 1922 and his Evolution of Hungary and its Place in Europe published in 1923. His contribution to geography gained him international recognition. During his career he was elected an honorary fellow of the Geographical Societies of Greece, Vienna, Berlin, Madrid, Finland and Italy. The French Geographical Society awarded him a medal for his work, while he was a guest lecturer at Williamsburg University and was awarded an honorary doctorate by Columbia University. He committed suicide in 1941.

Although the discipline of geography in post Second World War Hungary is comparatively small and, unlike Britain, has not passed through a phase of expansion, it has never the less flourished under the leadership of such eminent figures as Béla BULLA, György MARKOS, Tibor MENDÖL, Sándor RADÓ, Márton PÉCSI and György ENYEDI. The organisation of the subject is different, however. There are a total of nine university depart-

ments but none is organised on a unitary basis; instead the subject is split into separate departments of economic geography, physical geography, and regional geography. There are three departments of physical geography - at Eötvös Loránd University, Budapest (ELTE), Kossuth Lajos University, Debrecen (KLTE), and József Attila University, Szeged (JATE); four departments of economic geography - at Karl Marx University of Economics Budapest, ELTE, KLTE and JATE; and two of regional geography - at ELTE and the Janus Pannonius University Pécs. In addition, the Academy of Sciences supports two institutes involved in geographical research - the Geographical Research Institute, Budapest, established in 1950 with its own journal *Földrajzi Értesítő* (Geographical Bulletin), and the Centre for Regional Studies in Pécs formed in 1984 from the old Transdanubian Research Institute.

STUDENT NUMBERS

1. In Britain

According to the Universities Statistical Record, the total number of students studying geography in U.K. universities rose sharply throughout the 1960s and 1970s to peak at just over 6,700 in 1979/80 (*Fig. 1*). Numbers began to slip thereafter and by 1984/5 the number of geography students in the system was 8.8 per cent down on the 1979/80 peak. The total number of university students is also now declining, but this is from a peak attained in 1982/3 - the 1984/5 number was actually much the same as in 1979/80 - and there has clearly been some decline in the relative popularity of geography in recent years.

Student numbers may be broken down into an undergraduate (first degree) and postgraduate (research degree) component. Mirroring the overall trend, the number of geography undergraduates peaked in 1979/80 at over 6100 but by 1984/5 had fallen back to a level 7.7 per cent below the 1979/80 value. Regarding postgraduates, after rising sharply during the 1960s, numbers were stable during the 1970s at an annual total of around 600, but have since dropped sharply - to only 80 per

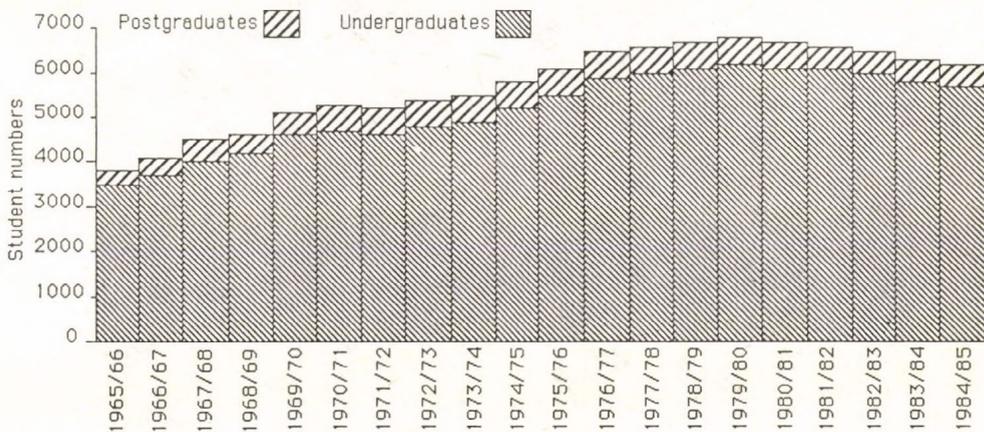


Fig. 1 Full-time geography students in the U.K.: 1965/66 to 1984/85
 Source: Universities Statistical Record, University Statistics

cent of the 1979/80 figure in 1984/5 (*Fig. 2*). As a result the postgraduate proportion of the geography student population has declined from over 11 per cent of the total in 1970/1 to barely 8 per cent in 1984/5. This trend does not bode well for the future health of the subject.

Furthermore, the aggregate first degree trends also mask very different patterns for men and women, as is exemplified by a breakdown of graduates. Hence the increase in the number of first degree geography graduates during the 1970s was primarily accounted for by a very sharp increase in the number of female graduates (*Fig. 3*). Likewise, the recent decline in graduates has been much sharper among males - a 12.5 per cent drop between 1981/2 and 1984/5 compared with a less than 2 per cent fall for females. As a consequence of these different trends by gender, undergraduate geography is now fairly evenly balanced between men and women whereas as little as 15 years ago it was a male dominated discipline. The proportion of females within the postgraduate body has also tended to rise.

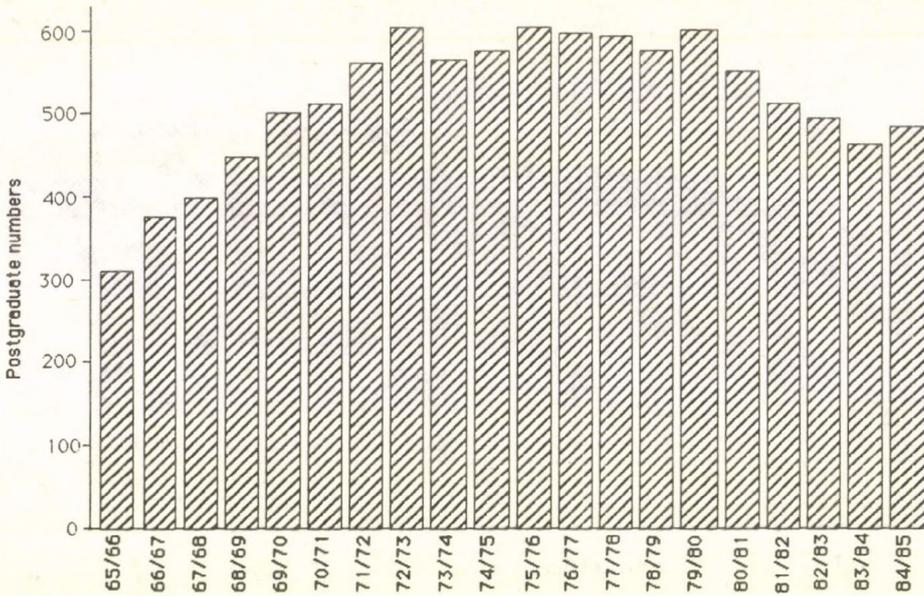


Fig. 2 Full-time postgraduate geography students: 1965/6 - 1984/5
 Source: Universities Statistical Record, University Statistics

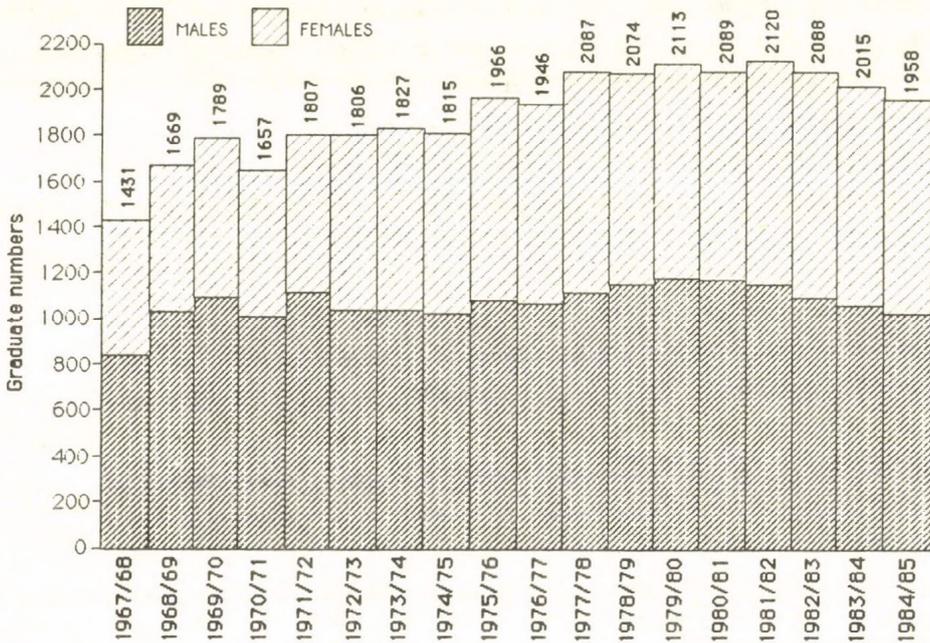


Fig. 3 First degree geography graduates: 1967/8 to 1984/5
 Source: Universities Statistical Record, University Statistics

2. In Hungary

There is no equivalent in Hungary to the full-time post-graduate student population of Britain, and the data below, which have been taken from Ministry of Culture (Művelődési Minisztérium) statistics refer to full-time undergraduates only. Moreover, the data below do not include figures for Karl Marx Economics University where geography is offered as a service course only.

Unlike Britain, the number of geography students in the three Hungarian Universities - ELTE, KLTE and JATE - has remained reasonably stable over the last 20 years fluctuating between a low point of just under 270 students in 1971/2 and a high of 365 in 1976/7 (Fig. 4). Nevertheless, when compared with Britain, geography at university level in Hungary is underrepresented. Thus, in terms of the relative population sizes of the two countries and assuming the British participation rate, one would expect to find something like 2000 students studying geography in the universities of Hungary, after allowance has been made for differences in course length. Looked at the other way round, the Hungarian participation rate is equivalent to around 1200 students studying geography at university in Britain, compared with the actual 6000. The contrast is even starker when viewed in terms of the comparative numbers graduating with geography degrees: the Hungarian total of around 75 per annum is some 4 per cent only of the number graduating in Britain. The weakness of the discipline in Hungarian universities is mainly due to the subsidiary position occupied by geography in the secondary school system of the country, and points to the vital link between a strong geography presence in the school system and the health of the subject at university level.

Also unlike Britain, the discipline has traditionally been female dominated although this orientation has diminished considerably in recent years, with females now making up around 55 per cent of the student population compared with around two thirds of the total during the 1970s. This trend is clearly connected with the phasing out of joint degrees with foreign

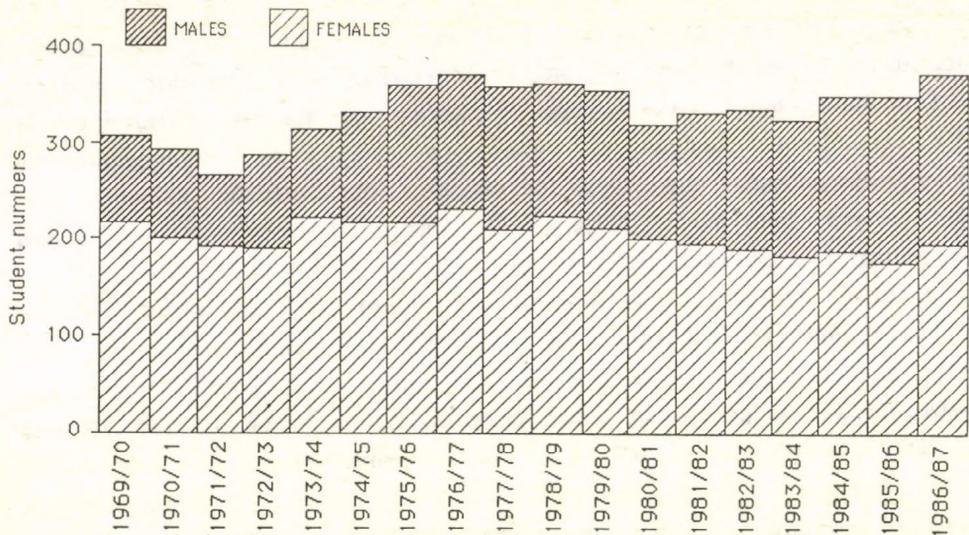


Fig. 4 Geography students in Hungarian Universities 1969/70 to 1986/87
 Source: Művelődési Minisztérium, Statisztikai Tájékoztató, Felsőoktatás 1968/9 - 1986/7

languages and the re-emergence of geography with biology as the dominant combination. History and mathematics are the other principle subjects that are combined with geography. The trend in the number of graduates, together with course combinations, is presented in Fig. 5. The nature of the geography degree in Hungary is discussed in more detail in a later section of the paper.

DESTINATIONS OF GRADUATES

In this section, we shall examine what happens to university geography students after graduation, i.e. the proportion going on the further education and training, their employability, and the types of job they are able to obtain. The Hungarian experience with its more planned approach to labour force demand is, of course, very different from the British situation where the labour market is largely unfettered.

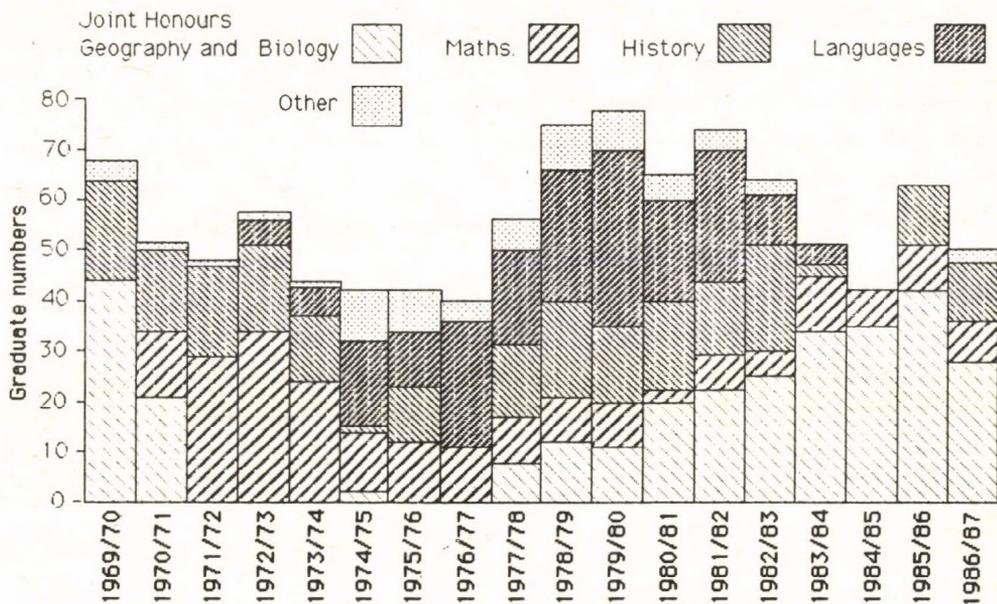


Fig. 5 Geography graduates in Hungarian Universities: 1969/70 to 1986/87
 Source: Művelődési Minisztérium, Statisztikai Tájékoztató, Felsőoktatás 1968/9 - 1986/7

1. In Britain

Geography is a non-vocational subject in the sense that it does not provide training for a specific occupation with the one exception of the teaching of geography. What it does provide, however, is a well-rounded general education that produces graduates who are both literate and numerate and who are sufficiently adaptable to be employable in a range of varied occupations. But only exceptionally will they be able to slot into a job without further training.

This is clearly fundamental to any interpretation of the difficulty that geography graduates have in finding employment relative to other disciplines. The first destination statistics published by the University Grants Committee relating to graduate unemployment rates six months from first graduation are the conventional means of undertaking this comparison although it should be borne in mind that the true

comparative position may not emerge as early as this. The position in 1984-85 is shown in *Fig. 6* when geography, with an unemployment rate of 10.8 per cent, ranked in 18th place out of the 30 disciplines recorded in terms of the difficulty its graduates had in finding employment or obtaining further training. This was somewhat higher than the average unemployment rate for all first graduates in that year which was 8.1 per cent, but was a relative improvement on earlier years.

The rank order of unemployment rates by discipline reveals a clear difference between the recognised vocational subjects - medicine, architecture, accountancy, law, engineering etc - where the rate is low, i.e. generally below 5 per cent, and the non-vocational subjects where it is noticeably higher, up to 20 per cent. A more valid comparison would therefore be to compare geography with the other non-vocational subjects. This comparison suggests that on a like for like basis the employment prospects for geography graduates are no worse than average - a 10.8 per cent unemployment rate for first degree geography graduates in 1984/5 compared with a group average of 10.9 per cent. The prospects for geographers are about the same as for students with degrees in economics, biochemistry, botany, history, biology and geology and are much better than for those with degrees in sociology, psychology, zoology and philosophy.

Details about the specific destinations of first degree graduates in geography six months after graduation are also available from the same UGC sources. These reveal that substantial changes have occurred over the last fifteen years or so, with the proportion of graduates going straight into employment rising substantially from just under 30 per cent in 1970/1 to over 52 per cent in 1984/5, while the proportion going into further education and training has correspondingly fallen from around 52 to just over 23 per cent during the same period (*Fig. 7A*). The sharp fall in the proportion going on to further education and training is largely explained by a very substantial decline in the demand for secondary school teachers of geography (*Fig. 7B*). - a feature shared by many

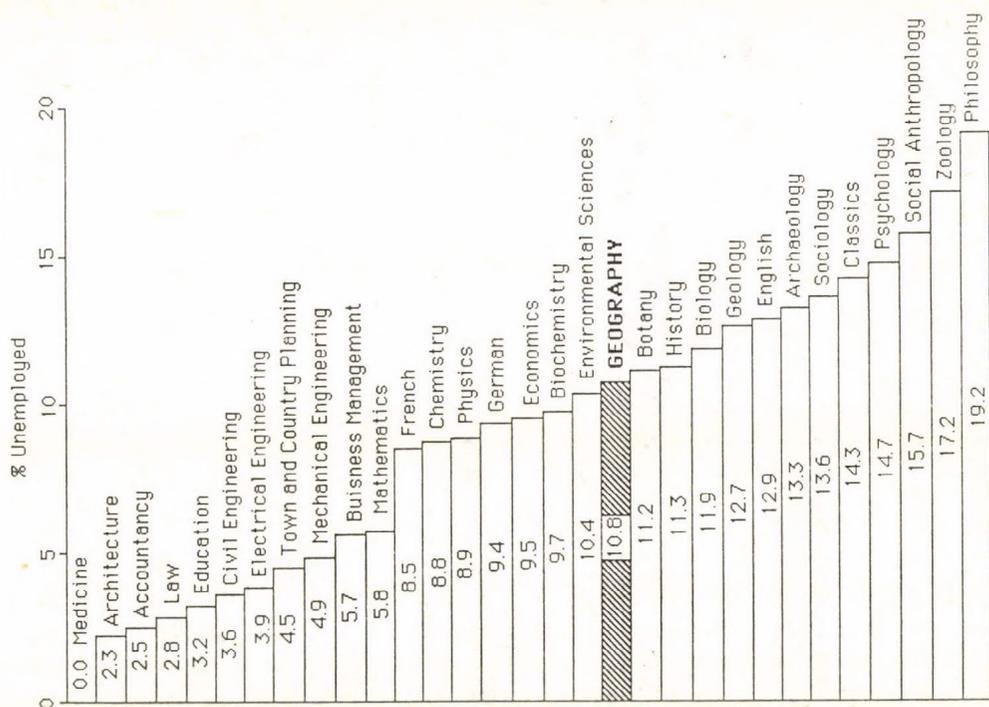


Fig. 6 Unemployment rates among first degree graduates: 1984/5

Source: Universities Statistical Record, First Destination of University Graduates

disciplines for demographic reasons. But additionally, the attractiveness of postgraduate research has also diminished in part because of worsening prospects for lecturing positions in universities and polytechnics but also because of greater competition for postgraduate bursaries.

Marked changes have also occurred in the patterns of first degree geography graduates entering gainful employment. Public service, and industry and commerce continue to attract about 90 per cent of them but within this the proportion going into the public service - the civil service and local authorities - has dropped substantially while the proportion going into industry and commerce has correspondingly risen. In part these changes are a response to general retrenchment in the public service together with changes in the pattern of public service

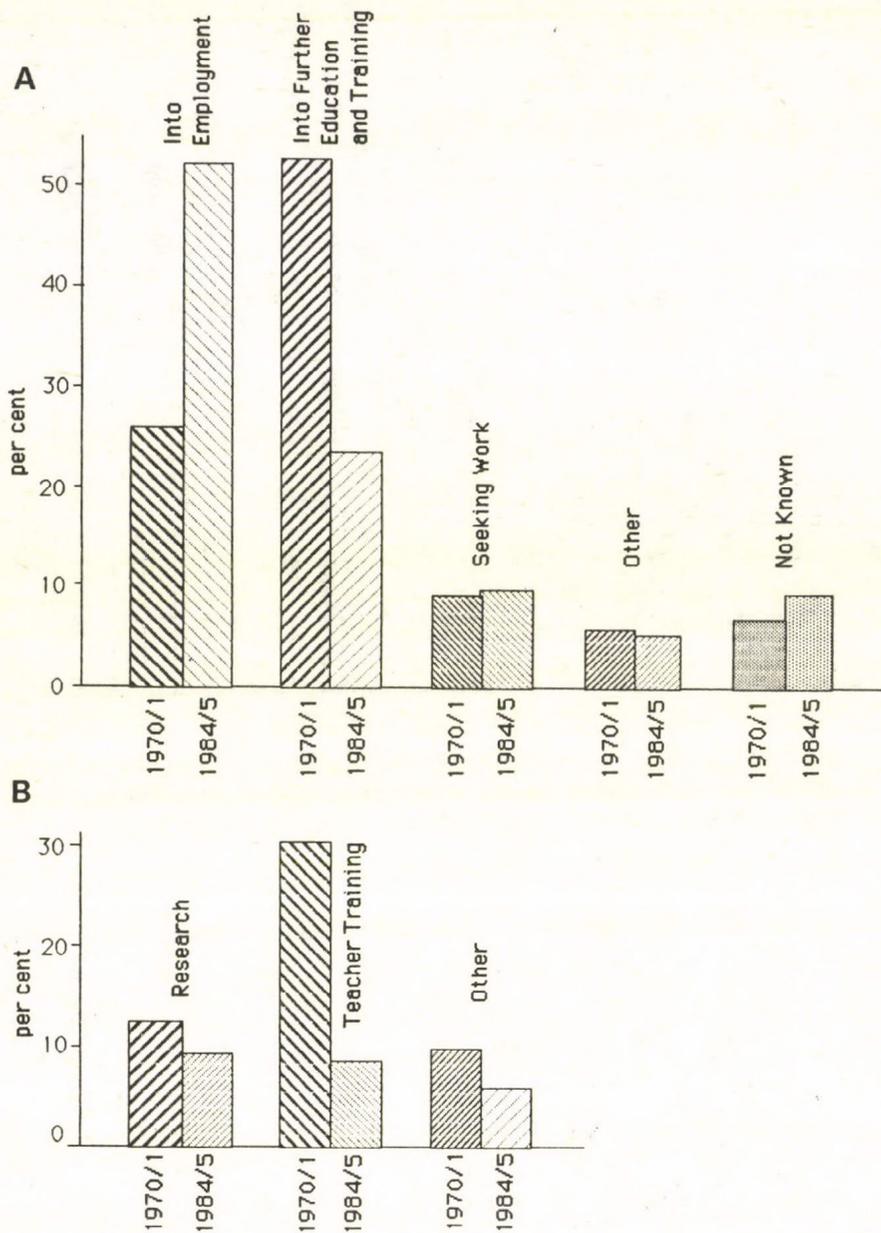


Fig. 7 A = First destinations of geography graduates: 1970/1 and 1984/5
 B = Breakdown of further education and training

Source: Universities Statistical Record, First Destination of University Graduates

job opportunities e.g. the drop in the demand for local authority planners from around 1975 on. But at the same time, private sector employment has become increasingly attractive particularly in the area of financial services.

The employment patterns of higher degree graduates in geography are rather different from the above. The most common outlet is still teaching and lecturing and between two fifths and a half have characteristically gone into this area in each year during the 1980s. Scientific research, environmental planning and library and information services are three further areas that each attract about 10 per cent of geographers with higher degrees annually. In other words, the bulk of geographers who go on to postgraduate study are still able to follow a career within the geographical profession.

2. *In Hungary*

No statistical information is available about the destinations of geography graduates in Hungary. The majority go into secondary school teaching but, as in Britain, many find careers in local and central administration as well as in research institutes. There is no unemployment amongst undergraduates in Hungary.

UNDERGRADUATE TEACHING PROGRAMMES

1. *In Britain*

Entry into a university geography course in Britain is competitive and is normally on the basis of performance in the 'A' level examination, a national examination normally taken at the age of 18 in three subjects and controlled by independent examining boards. There are five grades of pass, A to E, and a minimum of nine to ten points is normally required for entry into geography (A = 5 points...E = 1 point). As can be seen from *Fig. 8*, the 'A' level attainment of university geography students compares favourably with other subjects.

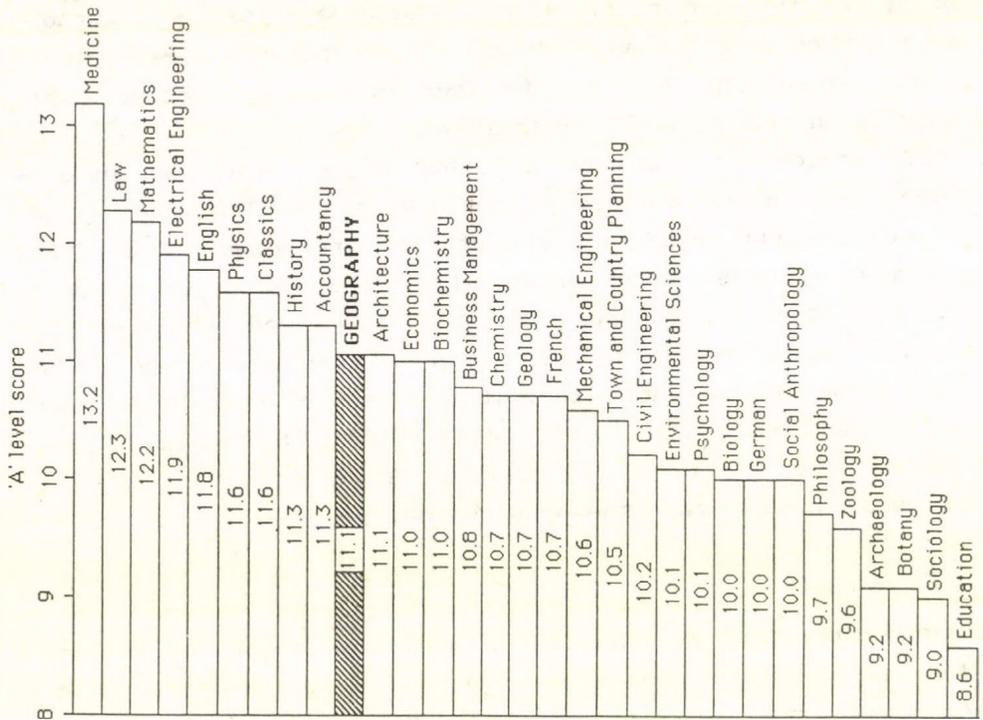


Fig. 8 Undergraduate entry qualifications: Average 'A' level scores, 1984/5

Source: Universities Statistical Record, University Statistics

While there are many differences of detail, the structure of the undergraduate teaching of geography in Britain is basically the same in all universities. Courses are generally three years in length, although in Scotland, because of less specialisation at secondary school, they are of four years duration. Where geography is taught in universities with conventional faculties, it is offered in the Arts and Science faculties, leading respectively to the degrees of Bachelor of Arts (B.A.) and Bachelor of Science (B.Sc.). In many universities it is also a subject in the Faculty of Economics and Social Sciences where it leads to the degree of Bachelor of Social Science (B.S.Sc.) although the precise name of this Faculty and of the degree varies from institution to institution.

Moreover, in the newer universities which may have a school as opposed to faculty structure, geography may form part of an Environmental Sciences/Studies grouping.

Students of geography may study it as a single subject to honours level or in combination with a cognate subject to joint honours or combined honours level. The single subject option involves the greatest degree of specialisation and although one or more subsidiary subjects in addition to geography are usually studied in the first year, geography only is normally studied in the second and third years of the course (third and fourth years in Scotland). For a joint honours degree, geography and the cognate subject are studied to the same depth. The range of joint/combined degrees involving geography varies greatly from university to university, but typical examples include geography with archaeology, geography with geology, geography with botany, geography with statistics, geography with mathematics, geography with computing, geography with history and geography with a modern language.

Although syllabuses may vary in detail, the similarities between departments are more striking than the differences. Differences arise for two basic reasons. Firstly, departments are free to determine their own course content and structure within the overall constraints laid down by the specific institution. Secondly, the balance of staff interest varies by department and the specialist courses on offer naturally reflect this variability. Otherwise departments have undergraduate structures which progress from a pattern of rigid, compulsory courses in the first year of study to almost total flexibility in the final year. Emphasis is placed on the teaching of the human and physical systematics and regional geography now receives a much lower weight compared with twenty five years ago.

These points are illustrated in *Table 1* where the undergraduate syllabus for single honours courses are presented for four universities - Exeter and Cambridge in England, St Andrews in Scotland, and Queen's University in Northern Ireland. Exeter and Cambridge operate the conventional English three

Table 1 Undergraduate Course Structures for Single Honours Arts and Science Students

	QUEEN'S BELFAST	EXETER	ST. ANDREWS	CAMBRIDGE
Preliminary Year	<ol style="list-style-type: none"> 1. Introduction to Geography: problems and methodology 2. Practical class 	—	<ol style="list-style-type: none"> 1. Human Geography 2. Physical Geography 3. Regional Study 4. Practical class 	—
First Year	<ol style="list-style-type: none"> 1. Principles of Human Geography 2. Principles of Physical Geography 3. Practical class 4. Field class 	<ol style="list-style-type: none"> 1. Human Geography 2. Physical Geography 3. Practical class 4. Field class 	<ol style="list-style-type: none"> 1. Human Geography 2. Physical Geography 3. Development of Geographical Thought 4. Practical class 5. Field class 	<ol style="list-style-type: none"> 1. Physical Geography (geomorphology) 2. Environment and Resources (biogeography) 3. Human Geography I (economic, social, urban) 4. Human Geography II (historical geography)
Second Year	<ol style="list-style-type: none"> 1. Geography of Ideas I 2. Quantitative Methods 3. Geography of Development 4. Regional Geography (choice of region) 5. Practical class 6, 7, 8, 9, Four courses from list below - at least one course from group A and one course from group B:- <p>A. Applied Physical Geography Quaternary Studies Climatology Geomorphology Biogeography</p> <p>B. Geography of Settlements Economic Geography</p>	<ol style="list-style-type: none"> 1. Cultural Environment 2. Natural Environment 3. Practical class 	<p>Courses selected from the following list which runs over two years:</p> <p>Biogeography Economic Geography Geomorphology Historical Geography and landscape Evolution Hydrology</p>	<ol style="list-style-type: none"> 1. Geographical Ideas and Methods 2,3,4. One from each of the following groups: <p>A. Human Geography I (economic) Human Geography II (urban geography) Political Geography The Geography of prescribed areas;</p> <p>B. Historical Geography I (North America) Historical Geography II (Cities) Population Geography</p> <p>C. Physical Geography I (Processes and Landscape) Physical Geography II (Tropics) Physical Geography III (climatic change and geomorphological processes)</p>

	<p>Political Geography Historical Geography Social and Population Geography</p>		<p>Regional Geography Resource Evaluation and Management Social Geography Urban Geography Dissertation</p>	
Third Year	<p>1. Geography of Ideas II 2, 3, 4, 5. Four options from the following list: Vegetation Applied climate Aspects of urban development Tropical geomorphology Historical I Historical II History of European Urbanisation Urban Social Geography Remote Sensing Political Geography I Soils Geography Population Geography Applied Geomorphology Political Geography II Social Geography I Social Geography II 6. Dissertation</p>	<p>1. Seminar or integrated studies in economics and geography 2. Advanced methods and techniques or Dissertation 3, 4, 5, 6. Four courses from following list: Applied hydrology Biogeography Geography of Health and Welfare Countryside Planning European Integration Fluvial Geomorphology Historical Geography Microclimatology Pleistocene Geography Political Geography of Eastern Europe Geography of the Third World Quaternary Geomorphology Urban conservation Retail location and Consumer behaviour Reconstruction of Early environments Iberian development History of Cartography Historical Geography of France Glacier behaviour Concepts in modern Geography</p>	<p>Perception studies Planning Political Geography Population Geography Quantitative Methods and Computing Quaternary Studies</p>	<p>1, 2, 3, 4, 5. Five from Human Geography I (United Kingdom) Human Geography II (advanced countries) Human Geography III (developing countries) Human Geography IV (urban, planning) Historical Geography I (medieval Britain) Historical Geography II (Industrial Revolution) Historical Geography III (France) Historical Geography IV (methodology) Physical Geography I (fluvial geomorphology) Physical Geography II (landscape of SE England) Physical Geography III (coastal) Physical Geography IV (glacial) Biogeography Resource management and conservation Methods of regional and spatial analysis Geography of SE Asia Geography of Africa Geography of Latin America 6. Dissertation</p>

year undergraduate course, Queen's Belfast a mixture of three and four year programmes, and St Andrews the four year structure characteristic of Scotland.

The progression from compulsion to greater choice is clearly evident in the syllabuses of all four departments. During their first year of study, students are exposed to basic introductory courses in human and physical geography in which practical work and field classes play an integral role. Included in introductory human geography are the main systematics - social, economic, historical, population, settlement, etc. while introductory physical geography emphasises geomorphology, biogeography and to a lesser extent climatology.

Since the Scottish secondary education system is less specialised than in the rest of the United Kingdom, two years are needed at St Andrews to bring students to the level achieved in England at the end of the first year. Nevertheless, these first two years follow the above pattern and focus on the physical and human systematics but include in addition elements of regional geography and the development of geographical thought. Until recently Queen's University also followed the Scottish four year pattern but is now reorganising around a three year structure. The four year pattern still lives on, however, in a preliminary geography year designed to cater for inappropriately qualified students and for conversion. In this regard, the preliminary year course at Queen's is unique and is not replicated elsewhere.

The second year of study at the four institutions exhibits the greatest variability. Normally, the second year combines an element of core curriculum, i.e. a compulsory course or courses, with flexibility of choice to cater for individual student interest and to permit some specialisation. The latter, however, is usually laid down within a carefully prescribed framework so as not to preclude unduly the range of choice in the final year. This philosophy is exemplified in the second year structures at Cambridge and Belfast where compulsory and optional courses within a structured framework exist side by side. Variations in course length account for the other differences at second year level.

In the third year, the structures again converge with the emphasis of flexibility and choice. As the list of options demonstrates, it is possible for a student both to specialise in one selected area or to maintain an all-round coverage of the subject. In Belfast and Exeter, however, a compulsory element is still retained at this level. Cambridge permits the greatest degree of specialisation while St Andrews, the second and third years operate as an integrated whole.

A characteristic of all geography departments is the proliferation of courses that has accompanied the shift to more flexible course structures. As we have already seen, the phase of expansion not only meant more students but also a very substantial increase in the number of academic staff. Since it was no more difficult to lecture to a class of 100 than of 10, the growth in student numbers by itself did not generate a commensurate increase in teaching load. Therefore, in order to spread this load more equitably but, more importantly, also to allow newly staff to teach their own research specialism there began a process of course fragmentation with lecturers sharing courses which formerly had been the responsibility of one, possibly two individuals, together with a proliferation of new specialist courses.

It is difficult to envisage the adoption of any other strategy in the circumstances and clearly it has many advantages. But equally, there has been a price to pay for as the content of the subject has become more diverse, so the nature of geography has become more elusive. Hence, geographers are viewed increasingly by academics in other disciplines as concerning themselves with subjects that are not properly their preserve. Moreover, with the virtual disappearance of regional geography it is increasingly difficult to discern a core curriculum within undergraduate geography programmes. The danger of these developments is that the subject may become so diffuse as to lose its distinctive identity which could well threaten its continued independent existence.

2. In Hungary

Entry into geography in a Hungarian university is competitive and is based on a candidates performance in a special entry examination set by the department concerned.

Unlike Britain, where the bulk of students study geography as a single subject, in Hungary the subject is rarely taught outside the framework of joint structures. A further difference is that courses are of five as opposed to three years duration. In addition, the teaching programmes are geared to producing secondary school teachers and are invariably combined with education.

At the Eötvös Loránd University in Budapest, geography is, at present, offered in the Faculty of Science as a joint degree with biology; at the Kossuth Lajos University in Debrecen it is offered in the Faculty of Arts normally in combination with history and in the Faculty of Science in combination with biology; while at the József Attila University in Szeged the usual combinations are with history and mathematics within the Faculty of Science. At the Karl Marx University of Economics, economic geography is offered as a service course as part of the degree of Political Economy and Planning. The subject is also taught at the Janus Pannonius University in Pécs within the Faculty of Education where it is of four as opposed to five years duration.

The Ministry of Culture validates syllabus content and structure and these therefore vary little from university to university. The syllabus of the joint geography-biology degree at Eötvös Loránd University may thus be presented as a general illustration of course structure in Hungary (Table 2). When compared with Britain, one is struck immediately by the much more general nature of the degree programme in Hungary, even after making allowance for the fact that they are joint degrees. Not only do students study their specialist subjects in their first, second and third years, but also political economy, Marxist philosophy, Russian and a second foreign, usually western, language.

Table 2 Undergraduate Course Structure - Geography/Biology Joint Degree
Eötvös Loránd University, Budapest

	First Semester	Second Semester
FIRST YEAR	<ol style="list-style-type: none"> 1. Political economy 2. Russian language 3. Sport 4. Military training theory 5. The structure of plants 6. Comparative animal biology 7. Comparative zootomical practical 8. The basis of geography 9. Astronomical geography 10. Climate and meteorology 11. Mineralogy - Petrology 12. General and inorganic chemistry 13. Mathematics 	<ol style="list-style-type: none"> 1. Political economy 2. Russian language 3. Sport 4. Military training theory 5. The structure of plants 6. Comparative animal biology 7. Comparative zootomical practical 8. History of philosophy 9. Elementary psychology 10. Archaeology 11. Geology 12. Cartography 13. Organic chemistry 14. General physical geography 15. General economic geography 16. Field trip
SECOND YEAR	<ol style="list-style-type: none"> 1. Dialectic materialism 2. Russian language 3. Sport 4. Military training theory 5. Plant taxonomy 6. Animal taxonomy 7. General physical geography 8. General economic geography 9. Developmental psychology 10. Computer studies 11. Microscopic anatomy 	<ol style="list-style-type: none"> 1. Historical materialism 2. Russian language 3. Sport 4. Military training theory 5. Plant taxonomy 6. Animal taxonomy 7. General physical geography 8. General economic geography 9. Second foreign language 10. Anthropology and the origins of man 11. Mathematics 12. Sectoral and regional economy 13. Field trips

Table 2 continued

THIRD YEAR	<ol style="list-style-type: none"> 1. Scientific socialism 2. Second foreign language 3. Educational theory 4. Biochemistry 5. Genetics 6. Physical geography of Hungary 7. Regional physical geography 8. Regional economic geography (two regions to be selected one each from groups A, B, and C: Group A - The socialist countries of Central Europe; the socialist countries of the Balkan Peninsula; Group B - The location of the forces of industrial production in the Soviet Union; Siberia; Group C - The effect of natural and social factors on the spatial differentiation of Soviet agriculture; China) 9. Sport 10. Plant ecology - soil science 11. Practice teaching 12. Specialist seminars 	<ol style="list-style-type: none"> 1. Scientific socialism and the history of the Hungarian working class movement 2. Second foreign language 3. Educational theory 4. Biochemistry 5. Genetics 6. Economic geography of Hungary 7. Regional physical geography 8. Regional economic geography (one region to be selected from - The economic geography of selected capitalist countries in Europe; The economic geography of the USA) 9. Basic instruction in law 10. General microbiology 11. Teaching in a summer camp for children 12. Specialist seminars 13. Field trip (physical geography)
FOURTH YEAR	<ol style="list-style-type: none"> 1. Compulsory Marxist subject 2. Second foreign language 3. Educational theory 4. How to teach biology 5. Botany 6. Comparative animal biology 7. Regional economic geography 8. Educational technology 9. Genetics practical 	<ol style="list-style-type: none"> 1. Compulsory Marxist subject 2. Second foreign language 3. How to teach geography 4. How to teach biology 5. Botany 6. Comparative animal biology 7. Regional economic geography 8. Evolutionary genetics 9. Cell biology

Table 2 continued

FOURTH YEAR (ctd)	<ul style="list-style-type: none"> 10. Animal ecology 11. The geography of soils 12. Regional physical geography 	<ul style="list-style-type: none"> 10. Geography option subject (one to be selected from - geography of tourism; geomorphological methods; methods of landscape research; Pleistocene studies; vertical linkages in the food industry; international division of labour; population geography; economic geography of Italy; Siberia, the North-South problem; world ethnology; economic geography of SE Europe; problems in population geography; urban processes; demographic explosion in Asia)
FIFTH YEAR	<ul style="list-style-type: none"> 1. Teaching practice 2. How to teach geography 3. Educational psychology 4. Etology 5. The history of biology and associated philosophical problems 6. Environmental protection 7. Political geography 8. Geography option subject (one to be selected from - regional development policy in Hungary; the economic geography of nuclear power; international division of labour and integration; vertical linkages in the food industry; population geography; the economy of Italy; soil research and mapping; geomorphological synthesis; new directions in geomorphology; karst geomorphology; geography of tourism; introduction to social geography; world ethnology; any regional geography course that is offered) 	<ul style="list-style-type: none"> 1. Teaching practice 2. How to teach geography 3. Specialist laboratory work

Further, unlike Britain, the university year is organised into two semesters, with an inter-semester break and examinations at the end of each semester. The number of formal contact hours with students is also substantially greater than in Britain; for example, first year biology-geography students at ELTE average around 40 hours of lectures and practicals per week in each semester in the first year, compared with around 25 hours per week for a geography student in the Science Faculty at Queen's Belfast (two courses in geography plus four in other subjects), although the number of hours devoted specifically to geography is not so disparate. A further difference lies in the reliance placed on the departmentally-produced course text book in Hungary, a function of the narrower range of geographical literature in the Hungarian compared with English language.

Turning to a comparison of the syllabuses, important differences may again be noted. Firstly, the ELTE syllabus is more structured than is usual for Britain with relatively little flexibility and little room for specialisation. Secondly, more weight is given to the teaching of regional geography both in conventional regional courses and within the framework of the teaching of systematic physical and economic geography (see A.SZÉKELY's paper in this volume). Thirdly, the ELTE syllabus places considerable weight on the physical and economic geography of Hungary; the syllabuses in Britain do not similarly stress the geography of the British Isles. Fourthly, although specialist courses are offered, they do not cover the same range or occupy as prominent a place in the syllabus as they do in Britain.

Clearly, we have exemplified here two very different approaches to the teaching of university geography that reflect not only the historical development of the subject in each country but also the differences in political system. The retention in Hungary of a strong core curriculum is an attraction as it gives the subject a clear unambiguous identity. There are also attractions in the breadth of the course of study. On the other hand, the very strength of university geography in Britain lies in the level of specialisation.

In this, it is no different from other disciplines in British universities, but there is now considerable debate as to the appropriateness of such specialisation given the needs of a modern economy for a flexible, adaptable labour force. The reforms that are already being introduced into secondary schools to reduce the level of specialisation may well force similar change on the universities.

RESEARCH

Geographical research in both countries is carried out in the universities, although in Hungary the Academy of Sciences through its constituent Geographical Research Institute and Centre for Regional Studies also plays an important role. There are no direct equivalents to these in the United Kingdom.

1. In Britain

There was a time when geographical research was carried out by individual academics with minimal technical back-up and no outside funding. However, the discipline has moved a long way since those days, and although it is still possible to work effectively in some areas without additional back-up, most research now requires substantial support staff input, as well as the availability of sophisticated equipment and sometimes considerable additional funding in the form of grants from outside bodies.

That said the most valuable asset of any geography department is its academic staff. According to the latest UCC statistics for 1984/5, around 600 academic geographers are employed in the university system. Thus, despite re-trenchment, there is still a substantial body of professional geographical expertise within Britain, although the numbers are 10 per cent down on the 1980/1 level. Of the academic staff, one tenth were professors in 1984/5, slightly lower than 1980/1, just over a quarter were readers and senior lecturers, slightly up on 1980/1, while the proportion of lecturers was about the same in both years. Reflecting

the lack of recruitment in recent years, the average age of academic staff is increasing at around one year of age for each calendar year and is now over 42 years of age. This is clearly a worrying aspect for the future health of the subject as the influx of fresh young minds is vital for innovative research.

However, not all geographical research in Britain is carried out by academics. There is still a considerable research output from postgraduate students in the form of masters and doctoral theses, around 100 of which are normally submitted in any one year. In addition, many departments employ research workers on short-term contracts, as well as their established research people, and these too make an important contribution to the overall output of research.

Like other disciplines, research in university geography departments is funded from both recurrent and capital expenditure. The bulk of recurrent money is spent on the salaries of academic and support staff with the remainder going into departmental grants from which research consumables are purchased. Capital expenditure, on the other hand, covers the purchase of research equipment. Some of this is used to provide central university services, like mainframe computing, but much goes directly into departmental equipment grants to be used at their discretion. The precise amounts of recurrent and capital monies vary from department to department and it is therefore difficult to generalise. By way of illustration, the departmental grant in Belfast amounts to £28,000 and the equipment grant to £20,000 annually. The total cost of running the department in 1985-86 came to over £550,000.

Human geography research is labour rather than capital intensive and specialist equipment needs are relatively modest apart from computing facilities which, in any case, are available centrally. Physical geography research, on the other hand, is more equipment oriented, and since these needs are, in general, not met centrally, the bulk of departmental equipment grants goes towards satisfying the demands of the physical geographers. However, since the science base of physical

geography is taken into account when calculating the equipment grants of geography departments human geography does not suffer in the process. It is for this reason that geography equipment and departmental grants are substantially greater than those received by social science disciplines like economics or sociology.

Given that universities in the United Kingdom are autonomous bodies, the historic funding base for geography departments has been a matter for individual institutions. The guiding principle has been the size of the student body coupled with some judgement of the cost of educating a geography student but the operation of local factors meant that unit funding levels varied widely from department to department. This system worked adequately in times of expansion but is now judged to be inappropriate by the Department of Education and Science.

Policy has shifted towards one of greater selectivity in the distribution of research resources and universities are no longer treated equally in this respect. Institutions are also being encouraged by Government to seek more research monies from industry. Funding is now by formula. Each university receives a uniform resource for teaching based on student numbers and average unit costs; about 65 per cent of the total recurrent university grant is for teaching. The remaining 35 per cent is largely for the support of research and is broken down into four components. The largest is related to student/staff numbers, i.e. this is base funding for research and is distributed uniformly among the institutions. The other three components are allocated selectively and are based on judgemental assessment, research grant income and contract research income, i.e. income earned from research commissioned by industry and commerce.

The policy of research selectivity came into effect in 1986/7 and will operate until 1989/90, thus giving the universities a four year planning horizon. However, since the shift to a system based on a uniform teaching resource and research selectivity is being implemented within the context

of an overall cut in funding, few universities are gaining additional resources from the process and most are taking a substantial cut in real income. This squeeze on resources is being met by staff reductions through early retirements and severance.

In addition to the funding of research by the University Grants Committee, further substantial support comes from the Government's science budget (£614m in 1986/7), which is allocated by the research councils. The funding of geographical research from the science budget is very modest and is channelled through the Natural Environment Research Council (NERC) with a budget of £68m in 1986/7, and the Economic and Social Science Research Council (ESRC) with a budget of £23.5m in 1986/7.

The research councils fulfil three well-defined functions: they support individual and team research; they maintain a limited number of specialist research units; and they make awards to students for higher degree work. For research grants, the main method of funding major research initiatives in geography and the other sciences, the procedure is to apply for support for a specific project. Competition for grants is fierce and applications are subject to peer review. Only a minority of projects are eventually supported. Projects in human geography are funded by ESRC and projects in physical geography by NERC. Awards for support postgraduate research are also bid for by academics and are linked to specific projects.

The Department of Education and Science is urging the UGC to apply an even more rigorous policy of selectivity, especially in those disciplines where research is expensive. The signs are that Britain is heading for a three-tier system in which a limited number of universities only, probably 12 to 15, will be fully funded for teaching and research. In the remainder research will either play a lesser role than at present or will be eliminated. One cannot yet discern with any clarity how these developments will affect the research of the 40 or so geography departments in the country. Although geographical research is substantially less expensive

than in the experimental sciences or engineering, it is also perceived as being of less utility or relevance. It is therefore unlikely that the discipline will escape rationalisation and some decline in the number of departments that are fully-funded for teaching and research may be expected in the future. What however is clear that the shape of geography research in ten years time will be very different from now.

2. In Hungary

Geographical research in Hungary is organised differently from Britain and is mainly concentrated in two research institutes of the Academy of Sciences - the Geographical Research Institute Budapest and the Centre for Regional Studies Pécs. The latter was newly formed in 1984 and is comprised of the former Transdanubian Research Institute together with elements transferred from the Economic Geography Department of the Geographical Research Institute. It has subsidiary centres in Budapest, Békéscsaba, Kecskemét, Győr and Miskolc. 51 researchers are currently employed in the two institutes. Both receive base funding from the Academy of Sciences but this is supplemented by contract research work for outside bodies - organs of local government, industrial enterprises, co-operative and state farms and so on.

Research is also undertaken in the geography departments of the universities but these are poorly equipped, financial support for projects is difficult to obtain and individual lecturers have comparatively little time for research given their heavy teaching loads. There are currently 62 academic geographers employed in the universities. As in Britain, the geographical profession in Hungary is an ageing one. There has been no recruitment of new university staff for a decade and well over one third of the profession are over the age of 50. Unless the problem of the recruitment of new staff is tackled, severe problems, organisational problems will soon emerge due to the flood of retirements. Despite efforts to the contrary, the unfavourable circumstances in the universities, and that includes the low salaries of as-

sistants, has led to a progressive shift in the focus of research from the universities to the two research institutes.

Research is co-ordinated by the Committee for Geographical Science which falls within the framework of the Department of Earth and Mining Sciences of the Academy of Sciences. This Committee approves and monitors the progress of research projects including the dissemination of results. It also organises scientific debates, prepares status reports on research and makes recommendations. Its work is hampered, however, by a lack of resources.

Unlike Britain, geographical research is closely tied to the needs of the national economy and therefore has a strong applied orientation. Three main components can be recognised: geographical syntheses involving research projects where physical and economic factors interact; research into physical geography; and research into human geography. Notable work in the field of physical geography includes the production of engineering geomorphological maps for at-risk areas, the analysis of loess and fossil soils, and environmental protection and conservation. The tasks of human geography include the analysis of the factors of industrial location, the planning and management of the settlement network, social geography and the protection of the human environment. Research of a synthetic nature has involved the production of regional monographs as well as systematic work linking physical and economic geography, for instance, the development of a methodology for land evaluation. Where appropriate geographers co-operate with researchers in cognate areas as in the National Planning Office, the Ministry for Building and Urban Development and the National Authority for Environmental Protection and Conservation.

Apart from the problems of underfunding and an ageing profession, which are largely outside the control of the discipline, a number of areas have been identified where performance should be improved. For instance, more members of the profession have been urged to become involved in the international arena by participating, for instance, in the IGU and within the collaborative framework of COMECON, and

by fostering personal contacts with foreign geographers. Geographers would also benefit from spending extended periods outside Hungary, as happened in the 1960s, so as to facilitate research abroad, and to improve their knowledge of foreign schools of geography and their proficiency in foreign languages. At home, there is an urgent need to increase co-operation between university geography departments and also with the research institutes as well as to bring physical and human geography closer together. In addition, geographers must be more in the fore in promoting interdisciplinary research because the understanding of the geographical environment and its complex interrelationships with man can only be achieved through closer co-operation with other earth and social scientists.

The absence of formal post-graduate training has already been alluded to and higher degrees are normally obtained through part-time study. Regarding the equivalence of higher degrees between Britain and Hungary, the masters degree equates with the small doctorate, and the Ph.D. with the candidate's degree, which renders a person eligible for election to the Academy of Sciences. Both degrees are obtained by thesis. The equivalent of the D.Sc. is the 'big' doctorate. With regard to the Academy of Sciences, there are three categories of membership - corresponding member, full member and honorary member. At present, two geographers are members of the Academy of Sciences.

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THE DEVELOPMENT OF REGIONAL (PHYSICAL) GEOGRAPHY AT UNIVERSITY LEVEL IN HUNGARY

A. SZÉKELY

GEOGRAPHICAL DESCRIPTION

Classical regional geography systematized data for given areas. As the term 'descriptive geography' would suggest, it was literally a descriptive discipline, mainly comprising the logical arrangement of data and the repetition in words of the factual knowledge provided on maps. This also applied to the geography of ancient Greece, the precursor of modern geography.

The first examples of geographical description in Hungary were published in *encyclopaediae* reflecting the customs, knowledge and demands of their times. In 1757 three volumes with geographical contents were published in Hungarian (HEVESI, 1974). (Similar contemporary works were written in Latin or German.) The most valuable of the three was the two-volume work (1757) of P. BERTALANFFI (1706-1763), a Jesuite teacher, which included much more physical geographical knowledge than the others (HEVESI, 1974). Using modern terminology, the first volume could be called astronomical and general physical geography (covering, among other topics, the stars, planets, plants and animals, the atmosphere, waters, rocks and relief), while the second was descriptive human geography: introductions to the individual continents, their countries with their mountains, rivers, plants and animals, and peoples.

their history, mining, forestry and industrial products, main settlements, their population numbers, religions, universities, state organisation, administrative divisions, strength of the army etc. In contrast to local contemporary works some explanations are also provided (etymology of names and even the origin of certain islands or mountains). The final chapters (nos XIX-XX) treat the geography of Hungary in a similar fashion, but in more detail.

Essentially, the regional geography of BERTALANFFI was the collection and enumeration of data, but its main importance lies in the fact that Hungarian regional geography can be traced back to it.

The most typical exponent of classical regional geography was the first university Professor of Geography in Hungary, János HUNFALVY (1820-1888). His attitudes and methods were most clearly expounded in his three-volume book, 'DESCRIPTION OF THE PHYSICAL CONDITIONS OF THE HUNGARIAN EMPIRE', published in 1863 - 1865 by order of the Hungarian Academy of Sciences. This work is a minute description of the physique of Hungary and amounts to an inventory of relief and other physical features. HUNFALVY collected all available data about the physical conditions of the country at the time, listing the various landscape units of historical Hungary which, before its dismemberment at the Peace Treaty of Trianon in 1920, comprised the whole Carpathian basin. He defined the precise extent of each mountain and hill region, valley and plain, provided altitudinal data, information about vegetation, major ridges and tributary valleys although later he criticized this work when he said: "In some places I only listed dry data."

Following on from this, HUNFALVY endeavoured to write a physical geography of the World using similar methods and in the same style, but in less detail. Of this 'UNIVERSAL GEOGRAPHY', which he had planned as five volumes, only the three volumes on Europe had been written by the time of his death in 1888. The third volume was completed by Gusztáv THIRRING in 1889.

Within this work too the most detailed information is the description of Hungary (Vol. 2). The physical geography sections are mostly abbreviated versions of the previous monograph, but easier to read, and are followed by an introduction to the historical background. The origins and customs of the nationalities are treated in detail. First the physical macroregions of the country are presented and then physical, population and economic features are outlined by administrative divisions. Settlements receive detailed emphasis and important buildings as well as squares and streets are described. Brief statistics are supplied about transport, administration, public education and cultural life.

These publications made HUNFALVY the father of regional physical geography in Hungary, and for several decades his were the only manuals that adopted a scientific approach. They also functioned as university text-books and not only satisfied a real demand, but also pointed to the way in which advances could be made. In a word, Hungarian regional geography followed the example of the German school.

Supported by HUNFALVY, this trend continued in the series 'THE EARTH AND ITS PEOPLES'. The authors, who were not geographers, relied on the best sources of that time and their own travel experience as they lead to the reader through the continents from America (Vol. 1) to Europe. Similar to other contemporary regional geographies, they arrange their material within national borders and, thus, dissect the major physical regions (like the Alps, Dinarids and the Balkans). Only islands and peninsulas (like the British Isles and the Iberian or the Scandinavian peninsula) are presented as physical units. Geology, relief, water and climate are followed by a colourful chapter on plant and animal life, particularly for exotic continents. The *peoples* are given even more emphasis than the land; population numbers, composition, economy, anthropology, customs, settlements, shelters, clothing as well as literature and visual arts appear equally in the series.

One of the authors of this popular series that ran to three editions over twenty years, was László TOLDY (1846-

1919), historian, chief archivist and writer of text-books. In producing the first two volumes (1879-80), his main source was Friedrich HELLWALD's work of the same title and other German geographers. The other author, Aladár GYÖRGY (1844-1906), cultural politician, writer and journalist, produced the most detailed part on Europe (Vol. 3, 1880) and edited the five volumes of the second edition, as well as significantly contributing to volumes 1-4 (1899). The last volume, about Hungary (1905) was born from the cooperation of 26 outstanding authors, including J. CHOLNOKY, G. CZIRBUSZ, L. LÓCZY and G. THIRRING.

It is clear from the above that topographic description was dominant in geographical education. Students and teachers had to store maps and data in their minds and the measure of the greatness of a teacher or the excellence of a student lay in their ability to list from memory the names and associated data for mountains, peaks and rivers, Geography was equated with factual knowledge, and, unfortunately, this remains the general view of the public today. On being asked to describe what geography is, most people cite the names of mountains, peaks and rivers and data about their height, length, width and other factual information. It was only very slowly that the verbal description of maps and the listing or data gave way to the analysis and evaluation of facts.

REASONING IN REGIONAL GEOGRAPHY

By the end of last century, regional geography had moved towards the *analysis and evaluation of maps and data* and had begun to reveal spatial relationships. The questions *where?* and *how many?* were increasingly replaced by those of *how?* and *why?*.

In Hungary, this trend was begun by Lajos LÓCZY (1849-1920), *a geologist and geographer*, who was professor and Head of the Geographical Institute of the University of Budapest from 1889 to 1908.

Between 1877-1880 he took part in Count Béla Széchenyi's expedition to Eastern Asia and travelled widely in China.

On returning home, he published his 'DESCRIPTIONS OF THE PHYSICAL CONDITIONS AND STATES OF THE CHINESE EMPIRE' (1886). Even this first regional work by LÓCZY is essentially different from previous studies, as he uses his personal observations and field experience to provide a comprehensive picture of the geography of China. The most detailed chapters deal with geology and geomorphology, complicated tectonic problems, terrace and loess morphology. Brief descriptions are supplied about plant and animal life, population, settlements, transport, administration and even political circumstances.

The scientific results of the expedition were also published in three volumes (1890-1897). Here LÓCZY primarily presents the geological conditions in 330 pages of text comprising 20 chapters (Vol. 1). The text is illustrated by 167 black-and-white and 10 coloured geological profiles, many maps and block diagrams. This is a strictly academic treatise presented in a matter-of-fact style.

These first works brought LÓCZY international recognition. His great merit was the correct interpretation of mountain structures of Central Asia and his talent as a structural geologist was also proved by his later activities home and abroad. The same attitude to research - relying on personal observations and field-work - is characteristic of his regional geography.

At his initiation and under his guidance, the Balaton Committee of the Hungarian Geographical Society was formed in 1891. Summarizing the results of 28 years of detailed investigations, the Balaton Monographs consisting of 32 volumes and 7,000 pages, and involving 60 collaborators, was published by the Geographical Society between 1897 and 1913 in both Hungarian and German. This unique series was acclaimed at the International Geographical Congress in Rome and was received favourably throughout the world.

In addition, he compiled an entirely different geography of Hungary entitled 'THE GEOGRAPHICAL, SOCIAL AND ECONOMIC DESCRIPTION OF HUNGARY', which was published in 1918 under the unfavourable conditions of World War I. This authoritative

work in large part was based on his own experience and research, but also involved 16 collaborators from various backgrounds. The physical, population and economic geography of Hungary is dealt with in detail, and is written a clear concept in mind, using frequent and highly illustrative comparisons.

In his large-scale regional works, LÓCZY's objective was complexity. In his view, the foundations of geography lay in the natural sciences and although the subject should therefore rely mainly on physical geography, population and social geography should be included and the geographer should regard the earth and man's relationships with it as inseparable halves. To this end - as opposed to the isolated activities of HUNFALVY - he organized *team-work* involving the best scientists from all fields. Several hundred prominent geographers and geologists studied under him at the university. However, in order to implement his ambitious plans of geological exploration, he resigned his university position in 1910 and accepted the directorship of the Geological Institute.

He was succeeded at the university by Géza CZIRBUSZ (1853-1920), who headed the Geographical Institute from 1910 to 1920. In contrast to LÓCZY, he was primarily a human geographer as reflected in his 'UNIVERSAL GEOGRAPHY' (translated and revised from Adriano BALBI, 1893). He relied on authentic sources and his own experience, and provided many demonstrative examples.

The *most typical representative* of this second phase of Hungarian regional geography was Jenő CHOLNOKY (1870-1950), a student of LÓCZY and later a close co-researcher and co-author. CHOLNOKY was also Professor and Head of the Institute of Geography from 1921 to 1941. Although he followed in the wake of LÓCZY, he was definitely a geographer and his achievements were the greatest in the fields of geomorphology and regional geography. He provided genetic explanations of the physical geography of the whole Earth in his six-volume work entitled 'THE EARTH AND ITS LIFE' (1936) as well as in his university and popular lectures. Typifying

his approach, he asked 'why?' much more often than 'how much?' in his examination questions.

As opposed to previous regional geographical works, in 'THE EARTH AND ITS LIFE' physical geography is tackled in terms of natural units, while political and administrative divisions remain the frame of presenting settlement, population and economic geography. Each volume begins with a summary of the physical geography of the selected continent, followed by the description of its macroregions. Where, national borders and physical boundaries cannot be reconciled, the introduction to the physical geography is followed by the detailed amount, of individual countries. For instance, first he portrays the Alps, then he compares the Western and Eastern Alps and finally goes on to present the Alpine countries.

He also travelled widely and relied on his excellent capacity of observation. This applied especially to the last (6th) volume in the series, where Hungary occupies as much space as a 'continent'. The first fifth of the volume is a general outline of the geography of Hungary, and the remainder is devoted to its macroregions (the Great Hungarian Plain, Transdanubia and the Northern Uplands). In addition to his own observations and investigations, he also drew from material in LÓCZY's 1918 monograph as he did in his 'GEOGRAPHY OF HUNGARY' (1929), where he followed LÓCZY's arrangement of material and only enlarged the sections on settlement and population geography.

CHOLNOKY replaced detailed description and the listing of facts with colourful overviews illustrated by abundant examples. Important facts are naturally retained but invariably accompanied with explanation, analysis of causal relationships. The texts are written in an easy style, and are illustrated by good photographs, sketch maps, block diagrams and drawings, most of them were made or drawn by himself. His popular works also served as text-books for university students.

In summary, CHOLNOKY's philosophy of geography lay in *explanation, evaluation, comparison, demonstration* in a word

recognised the comprehensive genetic nature of the subject.

CHOLNOKY's counterpart in *human geography* was Count Pál TELEKI (1879-1941), an outstanding statesman, Minister of Foreign Affairs (1920-1921), Minister of Public Education (1938-39) and finally up to his tragic death Prime Minister (1939-41). From 1921 to 1926 he was Professor of Geography at the University of Economics. In addition, he founded the Institute of Sociography in 1926, the Institute of State Sciences a year later and in 1938 the Hungarian Institute for Landscape and Ethnic Research, where a highly qualified staff handled the data collection and analyses for regional surveys and detailed mapping. This was the first institution of landscape research in Hungary.

He attended LÓCZY's lectures as a student of law between 1898 and 1901 and became assistant to him in 1902-1903, when strengthened his geographical interests.

His first contribution to regional geography was a pioneering summary of the economic geography of Hungary (1913) in the French language. As reflected in his university lectures, he believed in the unity of geography. In the first lectures he always treated America, the continent with the simplest structure, as explained in the introduction to the book (1922) based on his lectures. He regarded relief and climate as the fundamental factors of the landscape, emphasizing their control on drainage, soils and vegetation. It was from this physical perspective that he approached human geography, which he viewed as the intervention of the 'human, historical factor' into the 'competition of physical factors' (1922, p. VII). The historical perspective is equally underlined for the study of the physical and human components of the landscape.

His two-volume 'GEOGRAPHICAL FOUNDATIONS OF ECONOMIC LIFE' (1936) embraced the whole World and presents brief summaries of the physical geography of the continents and the landscape factors influencing the economies. 'The youngest and dominant landscape factor is man' - he emphasizes in Vol. 2 (1941, p. XI). Typologies are set up for the physical landscape, production (industry) and settlement.

TELEKY's principal method was the analysis and evaluation of map information and statistical data supplemented with his own observations. He sought to make regional geography as comprehensive as possible in order to reveal the past evolution and interactions of landscape-forming factors in their totality. In his works landscapes appear as the joint product of physical and human influences. He selected his material very strictly, emphasized the important features and dropped all superfluous detail. He may be described as a modern exponent of Humboldtian geography.

In many respects, he was the inverse of CHOLNOKY. While CHOLNOKY studied physical geography and built human geography (mostly revised material from already published sources) upon this basis, the primary focus of TELEKI was human geography with physical geographical information drawn from maps and literature provided to give a more complete understanding. The resulting geographical picture, however, is unified and complete.

Similar methods and attitudes were adopted by Ferenc FODOR (1887-1962). As an undergraduate he received his basic training from J. CHOLNOKY and as a lecturer at the University of Economics, he worked with P. TELEKI.

He provided an overview of 'THE ECONOMIC GEOGRAPHY OF HUNGARY' (1924) based on an evaluation of published sources in which he approached the economic life of the country from a geographical viewpoint. When studying smaller landscape units (such as the Szörénység and the Jászság), he was even more meticulous in map analysis and data collection than his professors. However, it is interesting to note that the geographical areas he selected in his comprehensive monographs for the treatment for economic geography were physical regions (1930, 1942).

REGIONAL GEOGRAPHY AT PROVINCIAL UNIVERSITIES

The trends developing at the universities of Szeged and Debrecen were at first rather similar to those in Budapest, but later acquired more individualistic traits. The works

of Károly KOGUTOWICZ and, particularly, of Gyula PRINZ are of nation-wide significance.

Károly KOGUTOWICZ (1886-1948) was Professor of Geography at the University of Szeged from 1923 to 1945. Of his large-scale geography of Hungary, planned as seven volumes, only two were completed ('TRANSDANUBIA' and 'LITTLE PLAIN'). As he states in the preface (1930, p. 3), he conceived the landscape as an independent and organic whole. With his collaborators he compiled inventories for the regions studied. In his evolutionary concept he begins with the geological basis, followed by the treatment of climate and the development of the atmosphere, hydrological conditions as the source of water, the geography of soils and soil-forming processes and the study of population starting with early men. The geography of settlement begins with the Roman period and the history of economy with the Middle Ages. The second part is a complete landscape geography, where factual data is used to trace cause-and-effect relationships and processes.

His works show the influence of LÓCZY, but occasionally his approach is close to that of Gyula PRINZ (1881-1973), a markedly individual representative of Hungarian regional geography. He was also a student of LÓCZY, but he gained experience at several other institutions. He was a student and then lecturer in Breslau (now Wrocław in Poland) where he studied and worked with J. PARTSCH. Between 1905 and 1912 he taught at the Geological and Paleontological Institute of the Budapest University. In 1912 he accepted the position of Head of the Geography Department at the Teachers' Training College, where he lectured in urban geography. His lectures were published under the title 'GEOGRAPHY OF BUDAPEST' (1913), a pioneer work in Hungarian settlement geography. In 1918 he became professor at Pozsony (now: Bratislava in Slovakia) University, worked in Pécs after the Treaty of Trianon, was in Kolozsvár (now: Cluj in Romania) between 1941 and 1945 and in 1958 retired from the Geographical Institute of the Szeged University.

His greatest enterprises were two expeditions to Russian Central Asia (in 1906 and 1909). His orographical, geomorphological and glaciological observations are particularly valuable and still valid today. In his comprehensive monograph on this vast area (1910, 1945) he also included phyto-, zoo-, settlement and anthropological data. His work was modelled on LÓCZY's 'CHINESE EMPIRE' but shows an original view of the topic.

Central Asia with its complicated geology, orography and drainage determined PRINZ's attitude: throughout his long life he continually emphasized the decisive role of recent tectonic movements and of *structural relief* on all landscape factors.

He utilized the experience he gained abroad in Hungary: firstly, in the 'GEOGRAPHY OF BUDAPEST' (1913) and particularly in the four versions of the 'GEOGRAPHY OF HUNGARY' (1914, 1926, 1938, 1942), where the development of his concepts is clearly traceable. All three editions focus on the presentation of structure and relief. While the first (1914) edition, as he writes in the preface, was only a 'rough sketch' of his college lectures, very much in the traditional, descriptive manner, the second edition includes fewer names and less data, their place being taken by analysis and a more comprehensive synthesis. The second edition (1926) is based on geogenetics and includes orogenetics, orotectonics, geomorphology and lithology - without climate and drainage. The third version (1942) is a concise analysis and mature synthesis, in which climate is also treated. It is striking, however, that he returns to the presentation of macroregions within administrative units. Of regional geography he states 'the face of the landscape is controlled by altitude, structure and lithology' (p. 82). In his opinion endogenic forces shaped the surface while exogenic processes are of secondary importance.

In 1942 he published an extended version of his 'GEOGRAPHY OF HUNGARY' as part of the series 'HUNGARIAN LAND - HUNGARIAN RACE', where he criticised the previous, encyclopaedic approach

to geography in his statement 'New geography paints the portrait of the Earth surface' (p. 371).

Also strongly emphasising structural morphology, he wrote the physical geography of Europe including only a brief chapter on the population of the continent. The *synthesis* of his three decades of research in regional geography is his 'GEOGRAPHY OF SIX CONTINENTS' (1943) consisting of 565 pages, two-thirds of which is devoted to Europe.

In all his works he employed a concise style and characteristic and expressive terminology.

A RETURN TO DESCRIPTION

The descriptive approach to geography was fully manifested in the German '*Länderkunde*' trend. Its main representative in the 1920s was Alfred HETTNER, whose '*GRUNDZÜGE DER LÄNDERKUNDE*', a succinct geography of the Earth, was well-known all over Europe.

Translated and amplified by Aurél LITCKE, Lecturer at the Teachers' Training College, HETTNER's book was published in Hungarian in 1925. Although obviously a step back to descriptive geography, it was a useful book of reference for university students and secondary school teachers until the early fifties.

Another work that influenced Hungarian regional geography was Fritz KLUTE's '*HANDBUCHES DER GEOGRAPHISCHEN WISSENSCHAFTEN*', but its 13 volumes were known only within a relatively small professional circle as they have never been translated.

The powerful German school recruited followers even from among the students of CHOLNOKY, two of whom later became professors specializing in physical geography. Andor KÉZ (1891-1968) treated regional geography very much in the manner of HETTNER, and used landscape units as a framework for organizing his material. He also put more emphasis on landscape evolution and soils.

Sándor LÁNG (1913-1982), for several decades professor of regional physical geography at Budapest University, included more data in his text-books than KÉZ, even at the

expense of stressing relationships. His approach was topographic and factual.

With the 1949 reform of university education separate departments were organized for physical and economic geography and a dualist geography ensued. Instead of building human geography on its physical foundations - the greatest master of which was CHOLNOKY - new approaches had to be experimented with. In response some turned back to description in human geography, while others began to concentrate on causal relationships anticipating the future developments of the discipline. An example of the former is Ernő WALLNER (1891-1982), who compressed long lists of production data into his works, and of the latter Ferenc KOCH (1901-1974), who expended considerable care in providing explanations and evaluations to his stocks of names and figures.

ANALYSIS, EVALUATION AND COMPARISON IN LANDSCAPE GEOGRAPHY

From the 1940s Béla BULLA (1906-1962) further developed the method of CHOLNOKY, who he succeeded to the chair of general physical geography on his appointment to the Headship of the Budapest University. He also lectured in regional geography and wrote two books about Hungary: one was a complete 'GEOGRAPHY OF THE CARPATHIAN BASIN' published in 1947 -(the human geography sections were written by Tibor MENDÖL) and the other was a 'PHYSICAL GEOGRAPHY OF HUNGARY' (1962), a university text-book relying on contemporary research. Landscape forming factors are presented within a regional context, and then synthesized into landscape 'synopses'. About half of the volume is devoted to geomorphology, particularly landform evolution, but BULLA successfully incorporated the evaluation of climatic and drainage factors into relief evolution. At that time more data on soils were available. The presentation of factual information does not dominate works, while his style is fluent.

Very limited sources and time were at his disposal when he compiled (again with T. MENDÖL) an outline geography of the Soviet Union in 1946. Soon after a geography of Hungary

for the wider public was produced by Márton PÉCSI (physical geography) and Béla SÁRFALVI (human geography). A brief but comprehensive portrayal of the country revealed the basic geographical relationships. The volume, translated into four languages, is useful for university students and interested non-professionals alike.

LANDSCAPE GEOGRAPHY TODAY

The basic unit of physical geography is the landscape, where a specific combination of landscape factors - location, geology (structure and lithology), landforms (relief and landform assemblages), climate, hydrography (drainage and river regime), vegetation, soils, fauna and human impact - may be observed. Since individual landscape factors are closely interrelated, a change in any one factor involves sympathetic change in the others. In areas of similar location, geology and relief, we do not necessarily find the same climate, hydrography, soils and biota, and consequently *each landscape unit has a unique character*. Identical landscapes produced from the same landscape factors do not occur - we only find regions with various degrees of similarity produced from similar combinations of landscape factors. It is on this basis that *landscape typologies* may be recognized.

Three fundamental types of physical geographical division of the Earth's surface may be identified:

1. the *traditional* (classical) *division* is based on geographical locations with similar climatic characteristics and hence indirectly similar biota and soil types. Structure and relief, on the other hand, are only coincidentally congruent with such divisions. As an example of such divisions we may cite north, west, central, eastern and southern Europe;

2. the *subdivision into landscapes* identifies physical units primarily on the basis of structural-topographic units, since these considerably influence other landscape-forming factors. Such units are usually associated with distinctive climates at both meso- and microscales, and indirectly control

hydrography, biota and soil types. For instance, in Hungary such landscape units as the Transdanubian Mountains, the Transdanubian Hills and the Little Plain differ, first of all, in respect of their relief;

3. *geographical zones* are the most extensive physical units and include landscape series. Geographical zonation may extend across continents and the similarity of the genetic factors is therefore less marked within zones than within landscapes. The principal factor determining zonation is climate, because it controls vegetation, soils and fauna, but structural relief is independent of it.

Which subdivision is used is a matter of one's approach. Thus, during the first stage of the development of regional geography only the first method could be followed, but during the second stage, as analysis was increasingly emphasized, the second method, ie. subdivision into landscapes had to be adopted. At the present time, with the emphasis on analysis, evaluation and assessment, the solution is to be found in either the second or third approach, depending on the specific objective of the investigation.

CONTEMPORARY TEACHING OF REGIONAL GEOGRAPHY

Not so long ago the teaching of regional geography at all levels was based on the classical divisions. A modern approach, by contrast, proceeds either through landscape divisions or zonations, although the most complete is some combination of the two. The subdivision into landscapes is, of course, more detailed and produces a multiplicity of macroregions on the Earth's surface. It is only at the university level that macroregions at this level of detail can be included in the syllabus, given the present teaching programme. But even here it is neither feasible nor necessary to list systematically each region's characteristics.

Rather the modern approach is a *detailed analysis of landscape* types revealing the interactions between landscape factors and the ways in which individual macroregions compare and contrast with each other within the context of individual

landscapae types. Compared with the traditional descriptive method, this presentation is not only professionally more useful, but also promotes the acquisition of knowledge, as the comparison of major types and the repeated listing of similar and dissimilar features provokes more profound analysis and independent thought. It thus encourages the formation of a correct geographical approach to the subject. In addition, through the permanent analysis of landscape factors, a knowledge of important general laws is more easily attained and their validity under various conditions recognized. There is sufficient opportunity for students to undertake independent work and in this way simple description is brought to life and becomes more interesting. The encyclopaedic listing of names and data is replaced by a lasting physical geographical appreciation based on multivariate relationships. Thus, the presentation of the principal landscape types through the medium of general physical geographical laws is a modern technique that may be appropriately employed in the teaching of secondary school geography, but - unfortunately - not under the conditions of the highly reduced number of hours devoted to geography in Hungarian schools today.

Regarding the present circumstances, a more general and comprehensive method, through the teaching of *geographical zonation*, has to be found. This approach provides us with an excellent opportunity to present a complex account of the spatial pattern of physical factors, and how this changes from the Equator towards the Poles, emphasizing the regularities and providing information that students will retain. Geographical zones are *syntheses* of climatic, vegetation, soil and geomorphological zones (SZÉKELY, 1975).

To select the most valuable method, the education system of a given country has also to be considered, taking account of the significance of geography in the syllabus and the number of lessons reserved for geography teaching (see COMPTON, P.A. in this volume). Nevertheless, it should be emphasized that relatively little factual knowledge is suf-

ficient to teach the most significant laws, and, that above all, it is important that the *correct thinking and attitudes be formed and preserved*. The shift in education from asking 'where?' and 'how much?' to 'how?' and 'why?' is clear. The 'where?' and 'how much?' are best represented in the form of maps, sketches and figures and, consequently, the better the visual representation, the longer the material will be retained.

The large-scale landscape studies, which began in the 60s, meant an important advancement in regional geography (for general overview see MAROSI, 1986).

One project which we have under way is the comprehensive evaluation of physical geographical elements and factors and the *exact assessment of environmental quality* employing various techniques. This is a modern synthesis of regional geography which yields up systematic material useful for practical purposes. In this respect, the individual parts of the Earth or of a developed country are studied in a highly selective fashion. Thus, from the point of view of education, it is important to test the areas to be presented, and to demonstrate the principles and methods to be used. The application the comparative method can assist with this approach and help make it more complete in the future.

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'THE WIND OF CHANGE':
REVIEW OF CLIMATIC STUDIES
WITHIN GEOGRAPHY

K. BOUCHER

INTRODUCTION

This paper attempts to review the development of climatic studies during this century along with the present 'state of the art' of climatology. Particular attention is given to the nature of research currently being undertaken in university departments of geography.

The study of climatology has never formed a major component of physical geography in Britain which has been dominated by geomorphology and to a lesser extent, biogeography. Undoubtedly, climatology has been seen as an important component of the physical environment but geographers have been reluctant to place it firmly within the orbit of geographic studies despite GREGORY's assertion that "climatology...may be seen as the prime concern of the geographer" (1985 p.54). It is evident that some geographers regard climatic studies as having 'refugee status' within the discipline. It is there because there is no other acceptable home for it. It is there by default. UNWIN, writing about climatic studies in 1981 said that "climatology has always sat uneasily within British geography departments yet to date it has not been convincingly taken up by any other discipline". This paper investigates some of the underlying reasons why climatic studies remain somewhat peripheral to mainstream geography.

CLIMATOLOGY IN BRITAIN
STAGES OF DEVELOPMENT

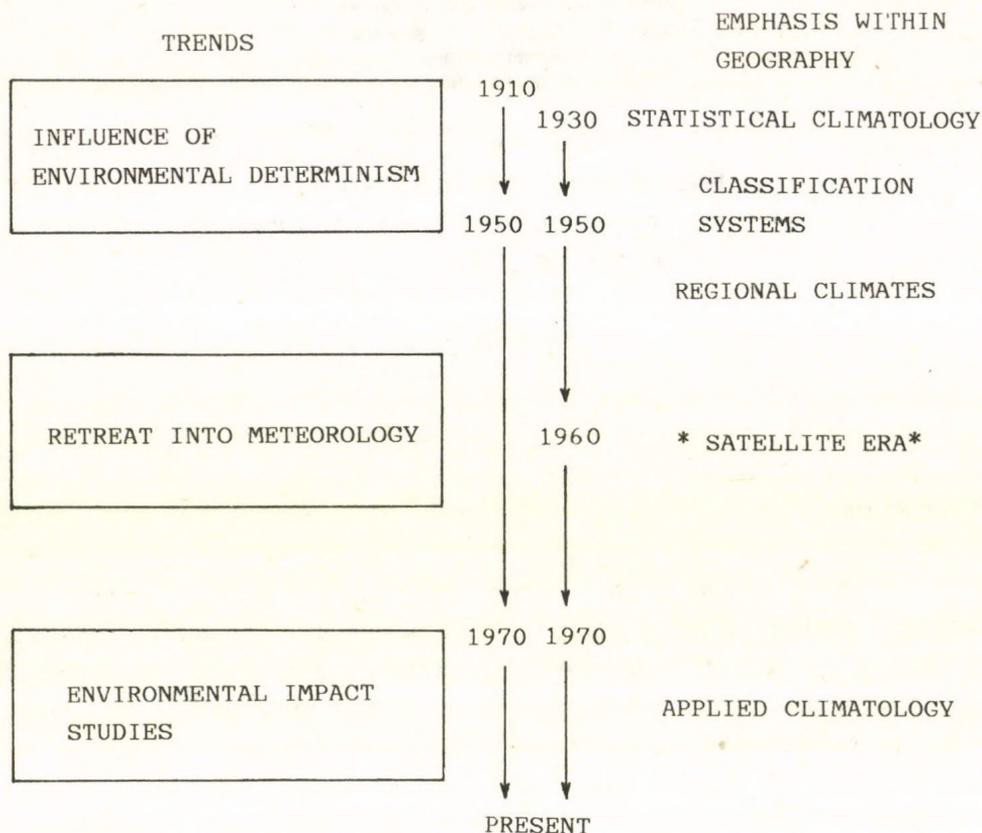


Fig. 1 Summary of stages of development in British Climatology

A summary of the stages of development is shown in *Fig.1*, where the influences and trends are indicated on the left portion of the diagram, approximate dates are shown in the central column and the dominant type of climatic study within geography is listed on the right of the diagram.

HISTORICAL REVIEW

British climatology developed slowly during the first half of the century. There were probably two main reasons for this slow growth. First, much attention had been given to the pre-

sentation of climatic data as a series of averages. Apart from being a rather sterile approach, it tended to portray climate as a static view of the atmosphere. This approach was evidenced in the preoccupation with the classification of regional climates. It may be that some well-meaning geographers thought that they had found a shortcut to science, but W. TERJUNG (1976) regards this period as 'climatology's darkest and least geographic interlude'.

Second, there was some confusion over the relationship between climate and human activity. There had been attempts to link these two firmly together following the ideas and theories of E. HUNTINGTON (1915) and others who were sympathetic towards the school of environmental determinism (GRIFFITH, TAYLOR, 1952; VISHER, 1952). This school of thought placed particular emphasis on human actions being determined by the environment rather than by social, economic and political forces. A. MILLER, Professor of Geography at the University of Reading, began his text on Climatology (1953) with the words 'The subject of climatology is intimately interwoven with the affairs of everyday life'. He went on to explain that controversy surrounded the way in which climate might influence society. For a while it became intellectually unfashionable to carry out research into the area of climate and human geography. Yet, as TERJUNG reminds us in his broad ranging paper based upon his experiences in the United States, geographical climatology should be of immediate relevance to geography because of its inherent interest in climate-human relationships. There was always the possibility that 'the baby had been thrown out with the bathwater'; that is, geographers had unconsciously rejected climatology because of its past association with the philosophy of determinism.

There may also be a third reason for the uneasy alliance between climatology and geography. Whenever the subject area of climate comes under attack there is a natural tendency to retreat behind the bulwarks of meteorology. Meteorology has become an accepted science with a proven record of scientific research whilst climatology has only recently developed its own field of research. It is also true that climatology

may depend upon meteorology for its concepts and data bases. Some may argue that climatology is merely a time and space extension of daily weather conditions. It is much more than this. As far back as 1951 WOOLDRIDGE and EAST (University of London) stated that 'though the facts of climatology will always be of high importance to the geographer, he must remain aware of the trend of meteorological research and be prepared to appreciate its conclusions'. Somewhat surprisingly the infant science of climatology received little welcome among the atmospheric scientists. Professor K. HARE speaking to an audience in 1978 said that climatology was a layman's word in the 1940s "you actually had to be medically disabled in order to get into the climatological division (of the British Meteorological Service). It was clearly not the age of climate. Now it is. It's the respectable thing to do."

GENERAL RESEARCH IN CLIMATOLOGY

Climatology has come of age and has become established as a field of enquiry allied to but not subordinate to meteorology. In one sense this has only heightened the tension existing between climate and geography. The tools of analysis in climate investigations are not those usually associated with geographic studies. Many researchers have therefore had to look elsewhere for the resources and training to carry out their research programmes. Undoubtedly this drift away from geography has been to the general detriment of the subject since interaction and discussion have become more restricted and the terminology less easy for human geographers to understand.

1. Climatic forecasting

It may be helpful to identify three main areas of climatic research currently in fashion and to indicate the strength of linkage with geography (*Fig. 2*). These are forecasting in its broadest sense, statistical analysis with or without dynamic explanation, and numerical modelling. It is helpful

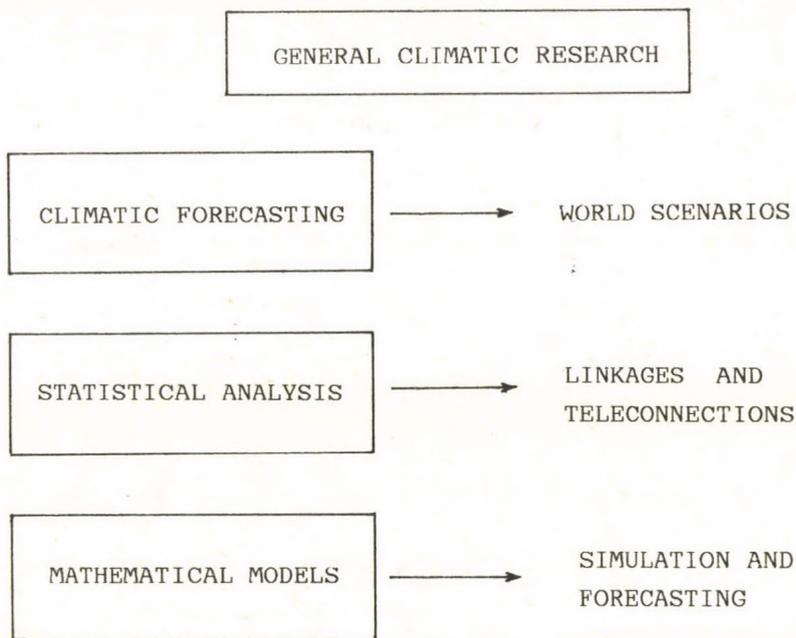


Fig. 2 Summary of main areas of climatic research

to say a little about each of these. I have chosen the word 'forecasting' to convey the idea of forecasting the climate of parts of the world for a number of years, maybe 10, 50 or 100 years. Whilst such an idea may seem totally unrealistic in terms of weather forecasting, there are aspects of the climate system that can be identified as changing over time scales of this magnitude. If this is so, then it may be feasible to produce a number of 'climatic possibilities' for some future point in time. These are termed 'scenarios'.

How closely the climatic forecasts may resemble the actual climate of the future depends upon the part played by the various components of the energy balance of the globe. Since the atmosphere is dominated by the two processes of positive and negative feedback, the forecasts depend upon, or are sensitive to the way in which these feedback mechanisms operate. For example, there is increasing concern over the rise in levels of carbon dioxide in the atmosphere and the likely

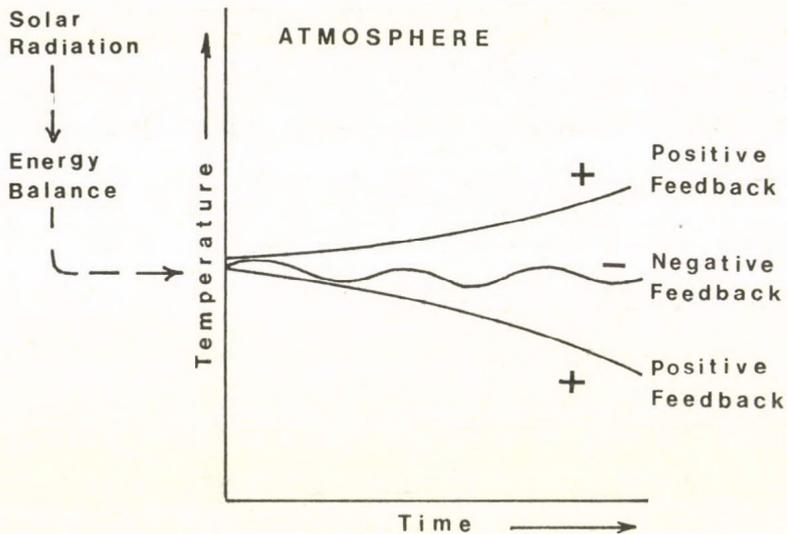


Fig. 3 Model of possible states of the atmosphere. An initial change in the energy balance may lead to one of three temperature patterns. The temperature represents global atmospheric temperatures in fractions of a degree whilst the time scale would be measured in decades of years.

effect this will have on global temperatures. If positive feedback processes dominate, then the effects will be cumulative and global temperatures may rise. If negative feedback processes prevail then there may be little overall change from the present state (*Figure 3*). There is rather more to this type of research than just guessing the pathways of energy through the atmosphere. There is the broader issue of whether the atmosphere is considered to be inherently stable, or whether it is sensitive to change at some point in time.

Such studies form an essential part of the worldwide research which is being carried out into the links between the physical components of the earth-atmosphere system as shown in *Fig. 4*.

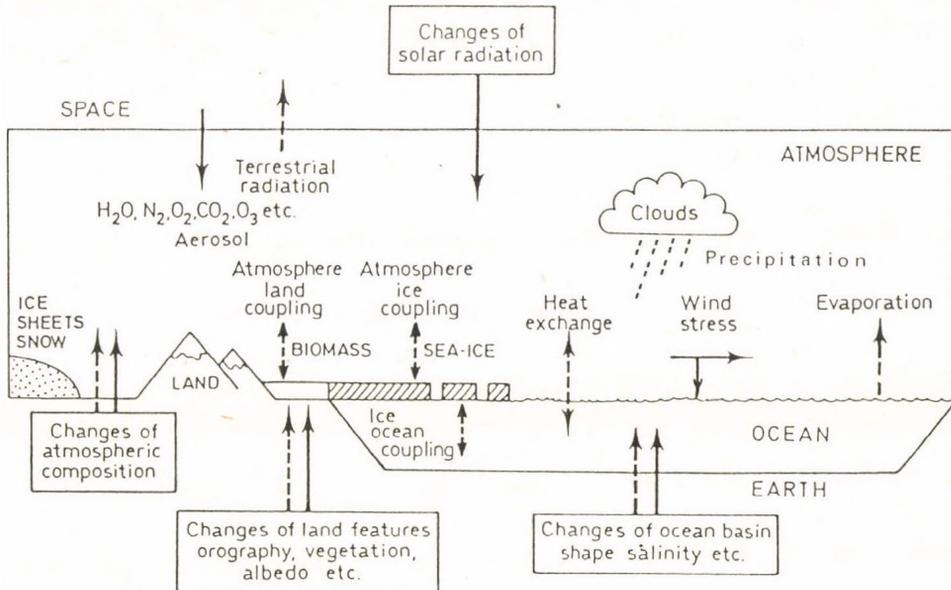


Fig. 4 Schematic representation of the components of the climate system (World Meteorological Organisation 1975)

2. Use of statistics in climatic research

A second line of research has been established based upon the techniques of statistical analysis. Such techniques seek to discover relationships and patterns within data sets. These include spatial Fourier and spectral analysis, empirical orthogonal functions and principal component analysis. It is sufficient for us to note two assumptions in this approach to climatic data. The first is that there is a pattern present which is capable of being analysed and second that placing a large set of variables into a correlation programme will reveal meaningful linkages in the climate system. An example will illustrate the nature of the problem. Over the past five years, considerable interest has been shown in a feature of the general circulation of the atmosphere known to climatologists as ENSO. This stands for El Niño-Southern Oscillation and refers to the adjustments to pressure and sea surface

temperatures which periodically occur across the tropical Pacific Ocean. It has been thought that such adjustments are not just on a regional scale but may affect the so-called 'wave trains' of the Westerlies which eventually imprint their presence on the climate of Europe. It is also conceivable that a relationship exists between ENSO events and other anomalous climatic features such as drought patterns in North East Brazil and the Sahelian zone of Africa. It is hoped that these correlation techniques will reveal precursors to the climatic events in Africa and allow some warning to be given of impact on human ecology, agriculture and food supplies.

3. *Climatic models*

The third area of research concerns the development of mathematical models and overlaps with the first two areas mentioned. These mathematical models owe much to the development of high speed computers and the demands for more accurate weather forecasts. Instead of forecasting weather patterns, a climate model attempts to simulate the many processes that produce the climate. In this case, the objective is not to produce a forecast for climate but to try to unravel how the atmosphere actually works. Models allow scientists to depart from the complexities of the real climate system and to simplify processes to reveal underlying principles. The models are started using present conditions of temperature and pressure in winter (for example) and then changing one or two of the components, such as sea-surface temperatures, and to note the changes that occur throughout the climatic system. There are many types of model. The exact model selected will depend upon the problem being investigated, the type of data available to initiate the model, the resolution of the grid scale and the time period over which you wish the model to operate. The models range from radiation and energy balance models that, on a global scale, are concerned with long term average conditions, through to General Circulation Models (GCMs) which calculate the entire three-dimensional character of the climate system and require considerable computational time.

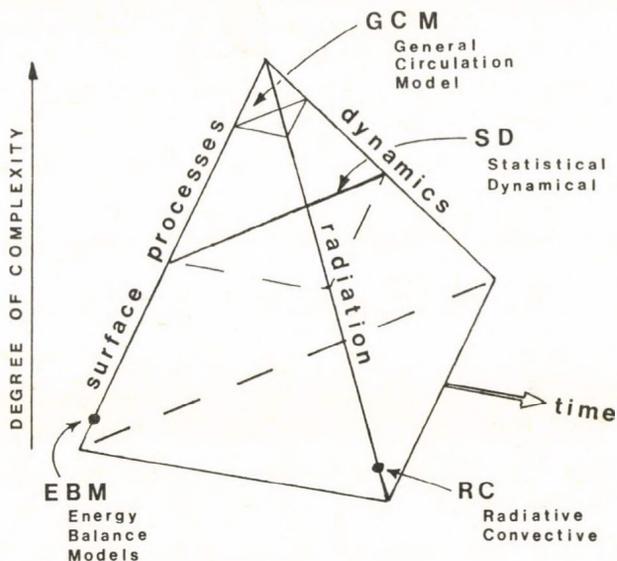


Fig. 5 The climate modelling pyramid showing the relationship between different types of models.
(After HENDERSON-SELLERS and ROBINSON)

A summary of the types of model is provided in Fig. 5 in what HENDERSON-SELLERS has termed 'the climate modelling pyramid'. The vertical scale on the diagram attempts to show the level of complexity of the model. The three edges of the pyramid represent the dominant model types - those of surface processes, radiation and dynamics. An additional dimension, that of time, also needs to be included. Further comments on model development occur in the following section.

From this brief survey it can be appreciated that much of the development of climatology has taken place outside the traditional boundaries of geography. There is a real danger that we may lose touch with the frontiers of climatic research dominated as they are by dedicated groups of young researchers in well funded organisations. To use the analogy of the socio-economists, climate finds itself on the periphery of geography at a time when it should lie close to its core. Changes, however, are taking place.

It was in 1960 that the Conservative Prime Minister, H. MACMILLAN (who died early in 1987) visited a number of countries in Africa and used the phrase 'the wind of change is sweeping through Africa' to indicate the swiftly changing political climate in Africa as the colonies of Britain and France were soon to gain their independence. This phrase 'wind of change' is used here to indicate the liberation of climate from the bonds of classification and statistics as studies in their own right. The trouble is that the subject that has emerged may be unrecognisable to geographers and be cast out once again from the discipline of geography, not because of its association with the philosophy of determinism but because it has become too far removed from the humanism of the present time. It is possible to see the dangers that may arise as a result. We may find that drought is studied but not understood in its climatic context. The nuclear winter is analysed but without an understanding of the models which reacted such an awesome and fearful scenario. Food supplies are analysed but without the intimate understanding of the climatic environment. Despite the difficulties inherent in studying climate, it is essential that it remains part of the discipline studied by geographers.

At this point, it is useful to summarise the research currently being undertaken within geography departments in England and Wales and to indicate where the future may lie.

4. Synoptic climatic studies

The second area of research is more typically British, investigating aspects of synoptic climatology. This branch of climate owes its origin to the investigations of weather patterns carried out towards the end of the nineteenth century. Of course, the 'Bergen School' of Norwegian meteorologists transformed our ideas of depressions (JEWELL, 1981). Since these weather systems continue to sweep across British Isles they have provided an endless fascination for climatologists and meteorologists alike (BARRY and PERRY, 1973). Though there has been a decline in the purely statistical analysis

of information, there has been a compensatory growth in remote sensing of weather systems (BARRETT and CURTIS, 1976). Instead of asking questions like 'Does more rain fall on the northern side of a depression than in the southern sector?' it is more likely that research will be seeking to unravel the airflow patterns which produce the rainfall events (BOUCHER, 1975. p. 211). In this research, satellite data from the polar orbiter weather satellites (TIROS) and from METEOSAT 2 (European Space Agency) are used alongside Doppler radar coverage to reveal the intricate pattern of ascending and descending currents of air in the vicinity of the depression. Some of the results of such research are of immediate practical value in providing 3-6 hour warning systems of floods.

Allied with the work on synoptic systems, lie the investigations into the nature of statistical properties of events such as floods (WARD, 1978). The variability of rainfall, the nature of gauging networks and the assessment of rainfall in the hydrological cycle continue to predominate in some departments (ATKINSON and SMITHSON, 1976). Work carried out in the United Kingdom may then be transferred to overseas locations in attempts to regulate water supplies in drought prone areas.

The last area of research lies at the small scale and may typically involve a study of climate and weather over an area of 100 square kilometres or less. Sometimes the research lies within the established areas of climatological enquiry - studies of sea breezes and of thunderstorm activity are examples. An advantage of some of these projects is that the work can be carried out by individual researchers rather than by a group of scientists. In the past this has been an important consideration under British funding procedures though this policy may now change.

5. Research in Applied Climate

Another research area has also developed over the past fifteen years and is more interdisciplinary in nature. Applied climatic studies have emerged within a number of geo-

graphy departments. This has included work on the impact of bad weather such as snow, ice and fog, on transport systems (PERRY et al., 1984). Work is also underway into the relationship between cold spells of weather and increased fuel bills for the low paid and elderly. Researchers are developing the interface between climate studies and social aspects of the economy.

There is also evidence of rising demand for certain types of climatic data from industry to enable more effective scheduling of construction work. Climate information is no longer being regarded as irrelevant to economic activity. Contractual agreements and linkages are merging between universities and private industry. Public (government controlled) industry tends to be less sensitive to climatic information. It may not wish to rely on data from outside its own system.

Included within this small scale research field lie the many burgeoning studies into the nature of the airflow near the surface within what is called the planetary boundary layer. Such studies are chiefly concerned with broadening our knowledge of the physical conditions that may exist and persist within this layer. So, for instance, acoustic sounders are used to investigate the thermal structure of the lowest 1000 metres of the atmosphere. Other programmes are concerned with the origin, transport and deposition of pollutants and may involve the cooperation of government agencies, private industry and academic research groups including those within geography departments. The results of such research may pose problems of independence and impartiality.

The final section summarises the work currently being carried out in the Geography department at Loughborough University of Technology into drought and rural development programmes with particular reference to Northeast Brazil and West Africa.

GOUDIE (1981) has emphasised the interaction between man and his environment in a wide ranging study of research. He is particularly concerned to show the part that climate plays in these interactions. There is an increasing awareness that some environments are sensitive to relatively small changes in climatic conditions. This has led researchers to explore in greater detail, the links between climate and socio-economic development in selected parts of the tropics. The chief area of investigation within the geography department in Loughborough has been into the impact of drought and rainfall variations on rural settlements in Northeast Brazil, Zimbabwe and West Africa.

There has been increasing concern with the effects that unreliable seasonal rainfall is having on projects for upgrading farming systems in semi-marginal areas. Whilst the Northeast of Brazil is known to experience periodic droughts, the prolonged shortfall in rainfall from 1977 through to 1982 was particularly severe. Large water storage schemes have been implemented but they have brought their own attendant problems. In particular, rural communities find difficulty in adapting to irrigation farming when their traditional methods have been rooted in rain-fed systems.

This was most evident in an investigation that was carried out in The Gambia, West Africa in 1986. Records of rainfall for this savanna zone have shown that annual rainfall has declined from around 1400 mm in the 1940s to around 800 mm by 1985 (HUTCHINSON). Whilst some years, such as 1987, may receive abundant rains, there seems to be an increasing tendency for dry years to occur in groups. This places stress on the ecological framework of the environment. This has been most evident in the Senegal-Gambia region of West Africa. As a result of a succession of dry years there has been a notable die-back of large areas of coastal mangrove (*Rhizophora*). In a study by JOHNSON in the early 1970s it was stated that mangrove, cut as fuelwood by the villagers, was able to maintain its existence without damage to the

environment (DUNSMORE, et al., 1976, p. 63). This no longer seems to be so especially in the area studied in the vicinity of Ziguinchor, Casamance in Southern Senegal.

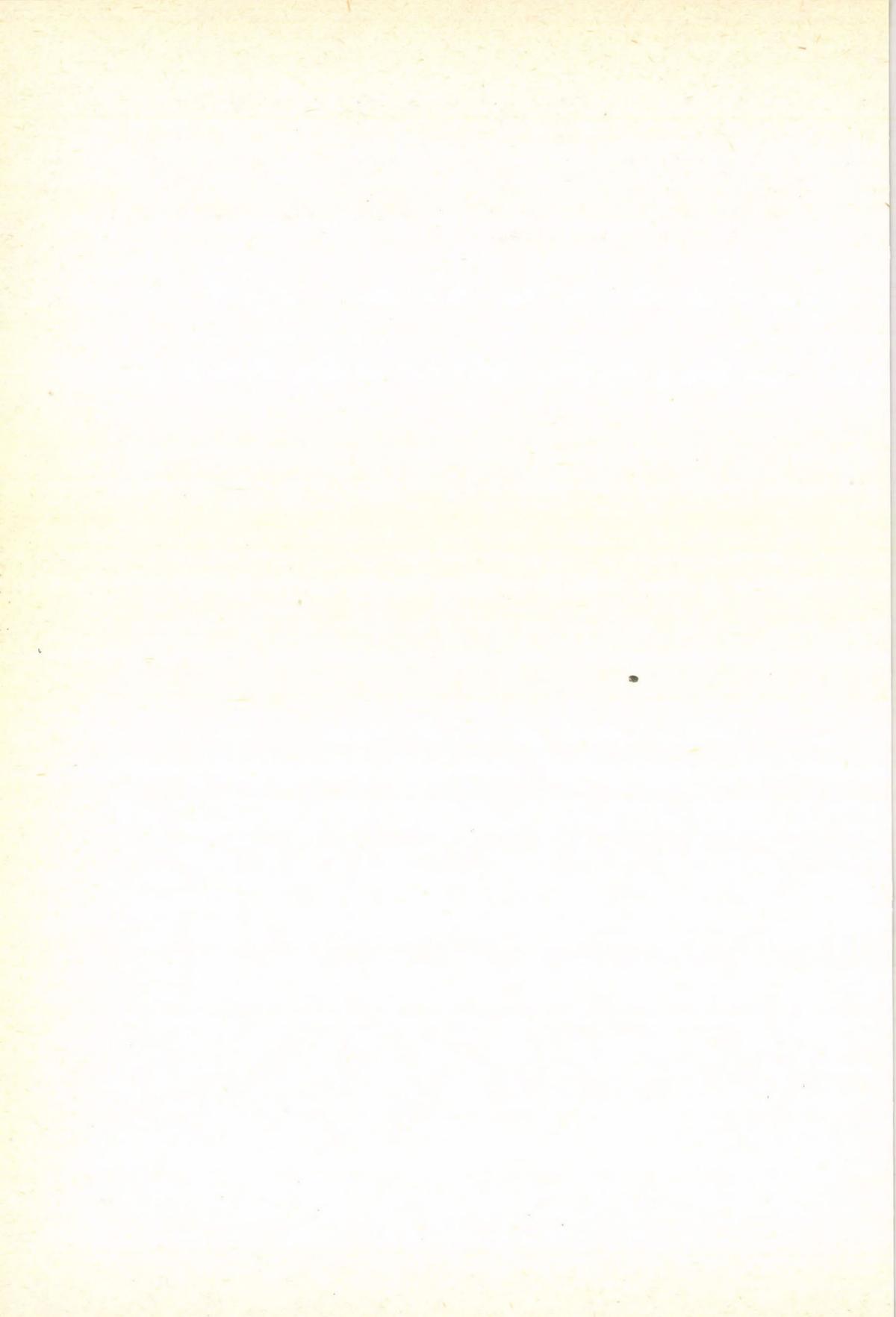
The decline in rainfall has also been accompanied by the failure of many shallow Gambian village wells to provide unpolluted water. New deep wells have been sunk. The clean water which can now be pumped from aquifers well below the surface, has had a marked effect upon health in the villages. These deep wells raise other questions which it is more difficult to answer. An investigation is needed, for instance, into the rate of replenishment of these aquifers with rain-water percolating down through the surface rocks.

These studies, therefore, indicate the ways in which climate interacts with environmental systems. It is in these multidisciplinary studies that climatologists are likely to be called upon to provide some expertise during the coming decade.

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AN ENVIRONMENTAL INFORMATION SYSTEM

I. TÓZSA

INTRODUCTION

Economic decisions concerning environmental management and regional planning increasingly require information based on thorough geo-investigations. This information may be used as the rationale in support of decisions. When planning spatial economic activity we have to be aware of all the factors of the physical and man-made environments which may influence the prospective activity (BARTKOWSKI, 1979). In addition, we also have to define the degree of interaction which will develop between the factors and the future activity. Not only do these interactions have to be defined but, to avoid wrong investment decisions, the degree to which the totality of these interactions encourage or obstruct the planned activity must also be known. The microcomputer-based geographical information system described in this paper provides one method of land assessment to overcome this latter problem.

AIM

The aim of the system is to produce map information which simultaneously displays both the most and the least suitable sites for a freely chosen economic activity in a freely chosen territory. Since the same territory can be assessed from several points of view, a decision can be reached as to which

economic activities are best provided for by the totality of environmental factors (TOMLINSON et al., 1976; WIDMER et al., 1974; LOVÁSZ, 1981; RÉTVÁRI, 1985).

METHOD

First a series of code-numbered maps are digitised to form the 'data-base' of the system. In order to obtain geological information from the system, geological, tectonic, stratigraphic, mineralogical, seismic, geomagnetic, geoelectric, gravitational and geothermal data must be stored in the data-base. If the problem concerns agricultural production, then data on soil properties, climatic conditions and relief types are needed. For information associated with environmental protection, we need data about air, soil and water pollution, noise and radioactive contamination. As regards the location of new industrial investment, the physical factors which are important include geological, soil mechanical, mass movement, hydrological and climatic data which must be fed into the data base.

As a second step, the relative importance of each of the environmental factors with respect to the chosen economic activity is established. This is achieved by weighting the qualities or quantities corresponding to the factors in the digital data-base. The weighted code-numbers are termed 'suitability indicators'.

The program then compares the data-base and the suitability indicators; by a system of point scores it performs the weighting procedure and classes of the grid square units of the investigated area into ten categories. The areal evaluation is always performed from different, well-defined points of view.

APPLICATION

Once the data concerning a relatively small area are available, detailed map information can be obtained about environmental suitability e.g. for growing tomatoes, wheat, maize, raspberries (LÓCZY and TÓZSA, 1982; ZELENSKY, 1980); about

the recommended location of, for example, a planned gravel pit or a holiday centre; about noise contamination and so on. The areas are represented in units of a few hundred metre squares.

With less detailed or combined data, the information system can aid regional planning and decision making over such matters as the best regions for growing corn, the location of power stations or waste-disposal tips so as to minimise damage to the environment, the mapping of the regions which may have the highest acid rain-fall, or the highest background radioactivity. The areal units in this case may represent territories of a few square kilometres.

RECOMMENDATION

This method, developed by the Geographical Research Institute of the Hungarian Academy of Sciences in 1986, can be easily and quickly adapted in order to investigate regions or areas for which environmental variables, and their mapped distributions, are available. The method permits the meaningful synthesis of the data for use in local or regional economic decision making.

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AGROECOLOGICAL MICROREGIONALIZATION BASED ON LAND CAPABILITY¹

D. LÓCZY

THE IMPORTANCE OF LAND CAPABILITY SURVEYS

Land, as a major natural resource, is being re-evaluated as a result of reform in economic policy in Hungary. Recently, several acts have been passed by Parliament to amend the legislation about land. The 1981 act on the protection of agricultural land was designed to prevent its dereliction and use for non-agricultural purposes. It included provision for a new land evaluation, with the survey to be implemented by the end of the 1980s. Survey scale (100 hectare units), personnel and financial support were all specified. During a later debate on this issue in March 1987, the Minister of Agriculture and Food claimed (VÁNCSA, 1987) that the 1981 regulation had successfully reduced the rate of alienation of agricultural land to half the previous value and that the progress of the new land evaluation was on schedule. However, other aspects of land protection, such as preservation of soil fertility, soil conservation and drainage schemes had

1

The project to draw agroecological divisions in North-Transdanubia completed under the guidance of László Góczán, D.Sc., with the participation of researchers at the Department of Physical Geography, Geographical Research Institute (István Benyhe, Dénes Lóczy, Katalin Molnár, László Szalai, Zoltán Técsy and István Tózsza).

had only achieved moderate successes.

The so-called Land Codex of 1987 unified the legislation on land, which had become extremely compartmentalized, and liberalized ownership. The Hungarian state owns 2,900,000 ha of land, while collective farms cultivate a further 5,700,000 ha. In addition, it is now easier for farming units to sell tracts of agricultural land to other collective or state farms.

Changes in crop pattern brought about by unfavourable trends in international markets also underline the need for a land capability survey. Some crops recently introduced into Hungary, for example vegetables like patisson, zucchini and broccoli and industrial crops like soya-beans, as well as new improved varieties may have special ecological requirements that need to be accommodated within the framework of a more detailed survey in the near future.

The new land evaluation system rates the quality of land from 1 (the worst in Hungary) to 100 (the best in Hungary). Although it allows fine distinctions to be made, the value of the agricultural habitat thus obtained does not measure up to the requirements of a modern evaluation system. No answer is given to such questions as:

- for which crop is the given agricultural habitat suitable?
- how many of the crops investigated can be grown there under favourable conditions? and
- what is the relative degree of land suitability?

REGIONAL LAND CAPABILITY MAPPING

Since the last British-Hungarian Geographical Seminar (Norwich, 1982), where a paper was presented on a method suitable for a land capability survey (LÓCZY, 1984), much has been done. The ecological parameters described in that paper have since been simplified, and better adjusted to the data available, the scale of the survey has been reduced from 6.25 ha units to 25 ha grid squares, while the method is now capable of extension to administrative units of some thousand square kilometres in area. Significant advances have been

achieved in the automation of data handling as well (TÓZSA in this volume). Both in Hungary and internationally the use of geographical information systems for the management of natural resources and the monitoring of the environment has been growing in the 1980s (COPPOCK and ANDERSON, 1987). Land capability analyses in Hungary are now founded on a GIS elaborated for North-Transdanubia, which is at present being extended to South-Transdanubia.

The Hungarian Academy of Sciences has been commissioned by the Hungarian government to devise a model for the rational use of land in Hungary. A necessary precondition for this task is the identification of agroecological microregions. (Agroecological microregions based on regional environmental potential have already been delimited in Hungary with boundaries adjusted to the administrative areas of municipalities to facilitate data collection (GÓCZÁN, 1984).) We decided to base the land capability method on the analysis of six major crops in a further refinement of the regional subdivision of local agroecological potential (on a strictly physical basis).

The system on which land capability regions is based is a parametric one (McRAE and BURNHAM, 1981), with several land characteristics being considered and assessed individually for each purpose. Naturally, this approach has its *advantages* and *disadvantages*. Although parametric systems are quantitative, accurate and specific, easy to apply and simply constructed, they require a comprehensive knowledge of pedology, agroclimatology, geology, etc. In a word, the objectivity of the system is highly dependent on the users' expertise.

It is true that the parameters can be easily altered, but this can be dangerous if it encourages the user to manipulate the scores until 'better' results are obtained. A balance between favourable and limiting land characteristics is difficult to attain, while interactions between factors are not easy to grasp. We tried to overcome this difficulty by constructing compound parameters, for instance, genetic soil type combined with the depth of the

humus layer and humus content. For easy coding, most of the data should be retained as individual or simple combination parameters, although it should be noted that an excessive amount of data may occupy too much computer memory.

Despite its deficiencies, we still regard the method as suitable for the delimitation and description of regions of different production capacities.

A METHOD FOR REGIONALIZATION

Agroecological microregions are identified in *two phases*. First, land capability is determined for each 25 hectare grid square (assumed to be homogeneous for land qualities of the county under consideration). The relatively small size of this basic unit ensures that no information of importance is lost. In the second phase we analyse the spatial distribution of the various grades of suitability for individual crops, from which different types of agricultural habitat are identified and grouped into microregions.

The size of the data set which contains those land characteristics to which cultivated crops are most sensitive calls for computer processing (*Table 1*). First, the *relief* conditions are keyed in as combinations of slope categories, slope exposures (for steep slopes) and degree of terrain dissection. *Climatic* conditions are represented by the mean temperatures and average precipitation values for certain critical months and for the various growing seasons of different crops. (In fact, it is a simplified version of the first experimental method, where a compound index for water availability was computed by formula.) Soil conditions are expressed as five land qualities and include compound land characteristics to indicate the interactions between factors. Genetic soil type is coded together with the depth of the humus layer and humus content; parent material and soil depth; soil reaction (pH) plus carbonate content; the assessment is completed by texture and groundwater conditions. The dimensions of the data base are illustrated by the fact that the soil properties alone are recorded as 576 separate classes.

Table 1 Parameters coded in the data base of land capability survey

I. RELIEF

1. Slope category (primary and secondary) + degree of terrain dissection + (for slopes steeper than 17 per cent) slope exposure (primary and secondary)

II. CLIMATE

2. Mean temperature for March
3. Mean temperature for April
4. Mean temperature for May
5. Mean temperature for June
6. Mean temperature for July
7. Mean temperature for August
8. Mean temperature for September
9. Mean temperature for October
10. Average precipitation for May
11. Average precipitation for June
12. Average precipitation for July
13. Average precipitation for the period April to September
14. Average precipitation for the period May to September
15. Average precipitation for the period May to August
16. Average precipitation for the period march to June

III. SOILS

17. Genetic soil type + humus content + depth of humic layer
18. Parent material + soil depth
19. Texture
20. Soil reaction (pH) and occurrence of CaCO_3
21. Groundwater depth, range + permeability

The data base is stored in coded form on diskettes and processed by a Commodore-64 personal computer. This inexpensive device is also available for individual farms and information is thereby easily exchanged and the practical application of the results is ensured.

The ecological conditions are then related to the requirements of the crops studied. Land suitability values are obtained from the information about land characteristics and are graded as excellent, good, medium, restrictive, highly restrictive and unsuitable for the cultivation of the given crop. Weights are applied according to the requirements of individual crops as described in the agronomic literature. Suitability analyses have been made for the six most important economic crops in Hungary: wheat, maize, sunflowers, sugar-beet, lucerne and grapes.

For each crop, grid maps are produced by the simple addition of the partial scores on the land characteristics and suitability is classed from 0 (the worst) to 9 (the best). Two types of land capability map are produced (*Figs 1A, 1B*): one indicates the highest level of suitability computed for the above crops in each grid cell, while the other indicates those crops (the initial letters of the Hungarian words are used) which are most suitable from the purely physical aspect. The grid maps are printed for each topographic sheet of a given county, and a unified coordinate system helps in their juxtaposition to obtain land capability maps for the whole country. Coloured copies of these maps are, at present, prepared manually.

Similar symbols (or colours) on these maps denote similar ecological conditions, and after homogenization by computer, patches of various types of agricultural habitat become distinct. If a transparent overlay showing grades of suitability is superimposed on this map, types of agricultural habitat can be delimited and described by the relevant letters and suitability grades (e.g. BK7 indicates that the area is 'best for growing wheat and maize at the level 7 on the 0 to 9 range' - *Fig.2*).

The next step is to form regions out of the areas of similar quality. An objective solution to this problem will only be available when the survey has been completed at the subnational level of Transdanubia, which comprises the data base, and a computer of sufficient capacity is available for performing cluster analysis. Until then we must be satisfied with de-

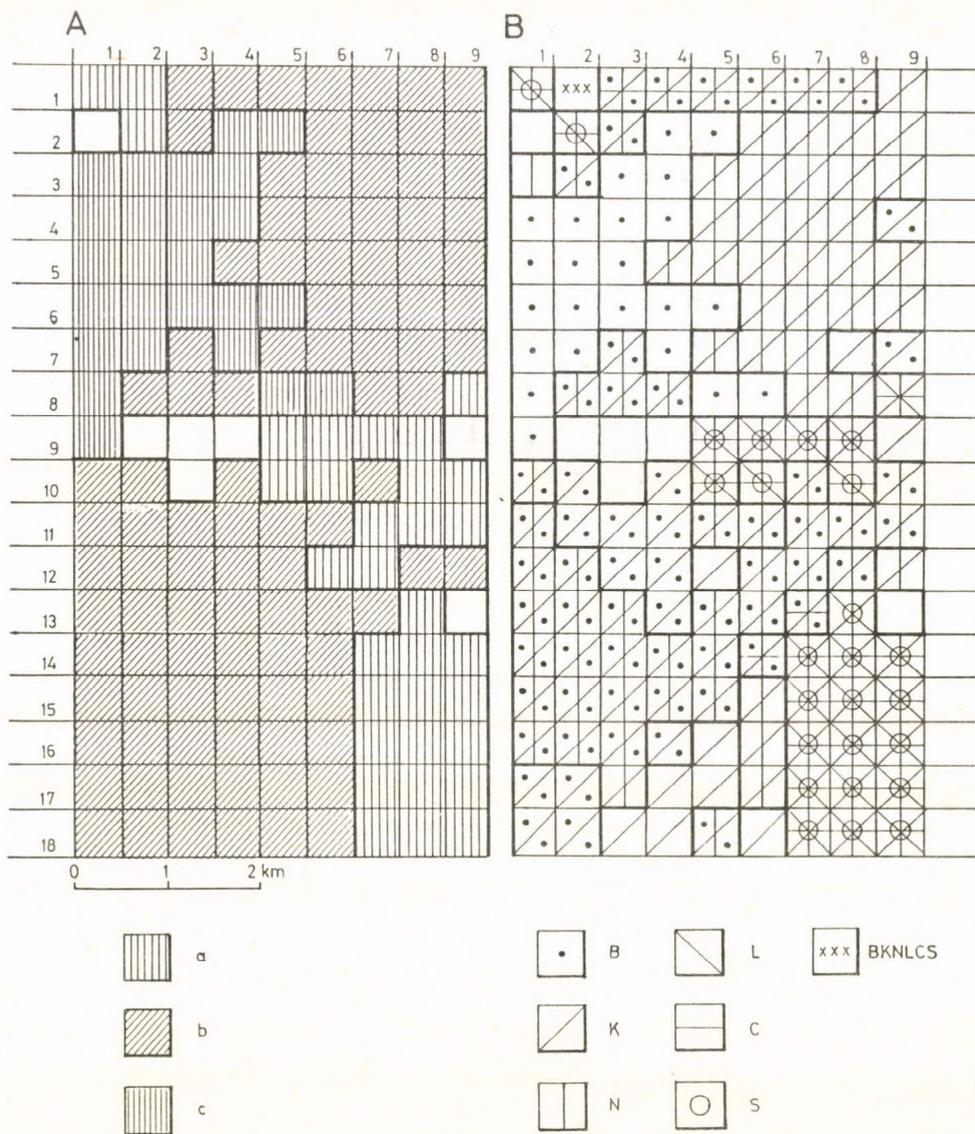


Fig. 1 Details of grid maps of land capability for Komárom county (after original by L. Góczán, D. Lóczy, K. Molnár and I. Tózsza)
 Variety A: map of maximum land suitability scores (on the range 0 to 9). Scores: a = 5; b = 6; c = 7. Variety B: map of crops with the highest level of suitability. The initials stand for crops: B = wheat; K = maize; N = sunflower; L = lucerne; C = sugar-beet; S = grape. Non-assessed units are forests or built-up areas.

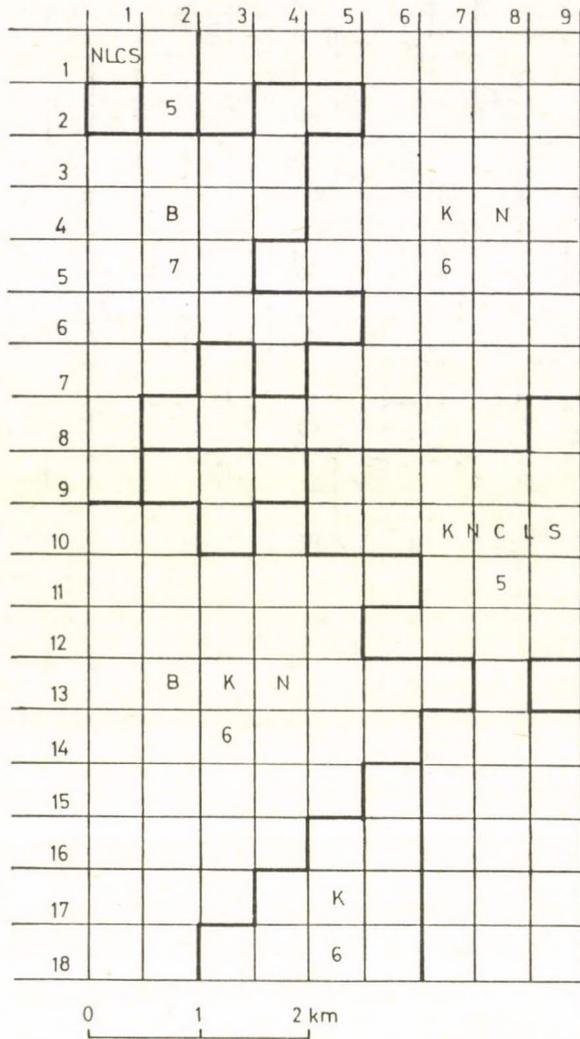


Fig. 2 Types of agricultural habitat for the same area. For explanations of initials see Fig. 1.

limiting regions manually within individual counties (the latter do not, of course, constitute agroecological regions).

MAP INTERPRETATION: AN EXAMPLE

The utility of maps of agroecological divisions can be best demonstrated for a county displaying the widest range of different environmental types. The agricultural habitats of *Veszprém county* are rather heterogeneous both in terms of quality and areal extent (*Fig.3*), and were grouped into 17 habitat types from 55 patch units (built-up and forested areas were excluded from the survey). The four regions (*Fig.3*) reflect: 1. a mountain foreland (hill landscape) with adjacent lowland zone; 2. the Bakony Mountains with its enclosed basins; 3. the narrow zone of the Balaton Uplands and 4. part of the *Mezőföld* loess plain, most of which lies outside the county. Although almost all types of agricultural habitat occur throughout the county, regions can nevertheless be differentiated by the predominance of one type or another or by the relative proportions of the different types.

The hill and lowland areas are characterized by types B (wheat), BKS (wheat, maize and grapes), and BK (wheat and maize) and over large areas equal scores were computed for either four or five of the six major economic crops. The scores, generally 5 to 7, attest to medium to high agricultural potential. (It should be noted that the values for grapes were not strongly differentiated and, in some instances, they were left out of consideration.)

At the higher elevations, the Bakony Mountains are mostly forested. Although the basins tend to appear as heterogeneous on the grid map of land capability, with a prevalence of wheat and to a lesser extent maize, some parts show greater diversity with medium scores of 5 for a BKCLS type - wheat, maize, sugar-beet, lucerne and grapes. Otherwise the values are equally low for all crops over extended surfaces.

Along the northern shore of Lake Balaton a 5-15 km wide zone is better endowed (region III). Some hundreds of hectares of land best suited for wheat growing alternate with areas

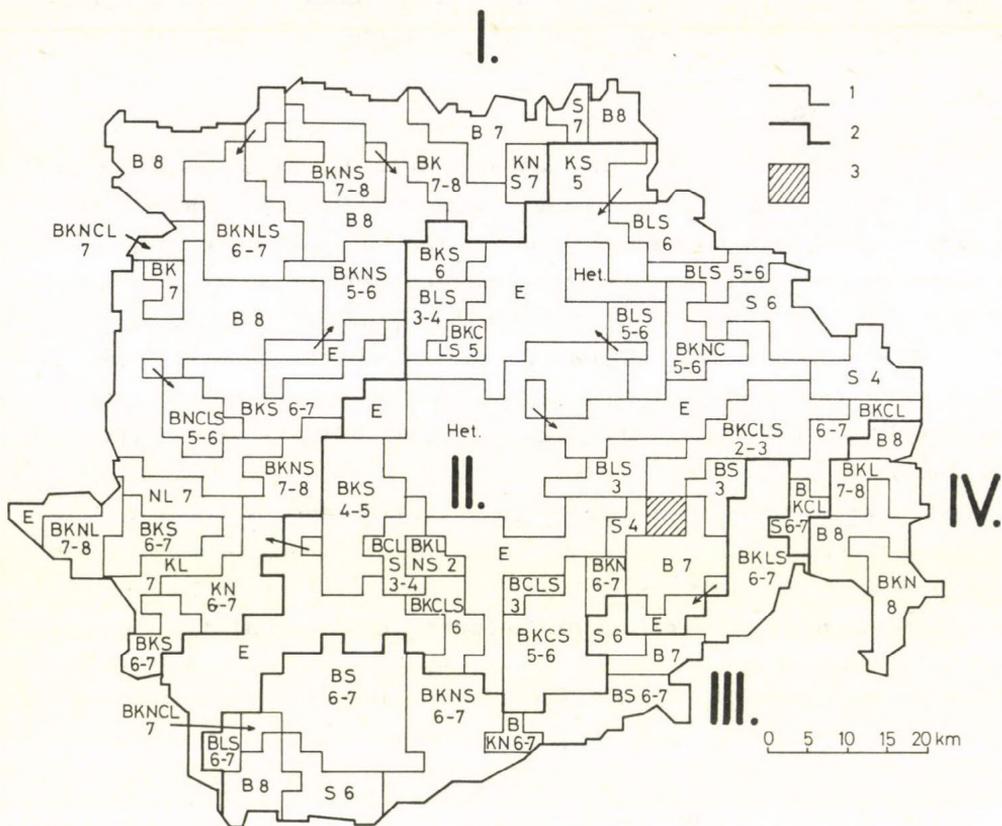


Fig. 3. Types of agricultural habitat and agroecological divisions in Veszprém county based on land capability survey (simplified after Szalai, L. - 550 ha units instead of the original 25 ha ones).

1 = boundary of habitat types; 2 = boundary of microregions; 3 = built-up area. For explanations of initials see Fig.1.

that are optimal for vineyards, where slope exposure is predominantly of southern aspect. The scores (6 to 7) indicate favourable conditions for these specialisms.

The limited part of the Mezőföld loess plain that falls into Veszprém county is of outstanding agricultural potential, particularly for growing wheat and to a lesser extent maize.

It is necessary to discuss whether the ecological regions obtained are more or less identical with the physical micro-

regions mapped for Hungary by PÉCSI et al. (1979 - *Fig. 4*). Although some prominent boundaries coincide on both maps, the two approaches nonetheless yield different outcomes. Thus tracts of land where either the limitations or favourable conditions for agriculture are practically identical may fall into different categories on the map of physical regions, while physical microregions, in turn, may not appear on the agroecological map as having the same potential for crop production.

APPLICATIONS

The scale of the present survey allows the application of the results to regional planning. It must be emphasized again, however, that agroecological microregions have been delimited only on the basis of physical conditions and economic factors have not entered into the procedure. The methodology of an economic evaluation of land has not yet been elaborated for Hungary. Although recent attempts at complex land evaluation (BENET and GÓCZÁN, 1974; SZÜCS, 1984; NÉMETHI et al., 1985) are more satisfactory in the way they consider ecological factors than previous methods, they do not meet all the requirements since they exclude a component measuring land rentability in the context of location (GÓCZÁN, 1973, 1978). However, the calculation of land rentability is aided by the delimitation of agroecological microregions.

The distribution of types of agricultural habitat indicates the degree of homogeneity of a given agroecological unit. The symbols describing the types should not be treated as firm proposals for the planning of crop patterns but rather as tools for the optimum design of crop rotation. Where a wide range of crops with high scores is indicated, it follows that there are more alternatives for diversifying crop production in response to market needs. Moreover, specialization, a desirable trend encouraged by the state, is promoted if farming units receive up-to-date information on the ecological potential of the land they cultivate.

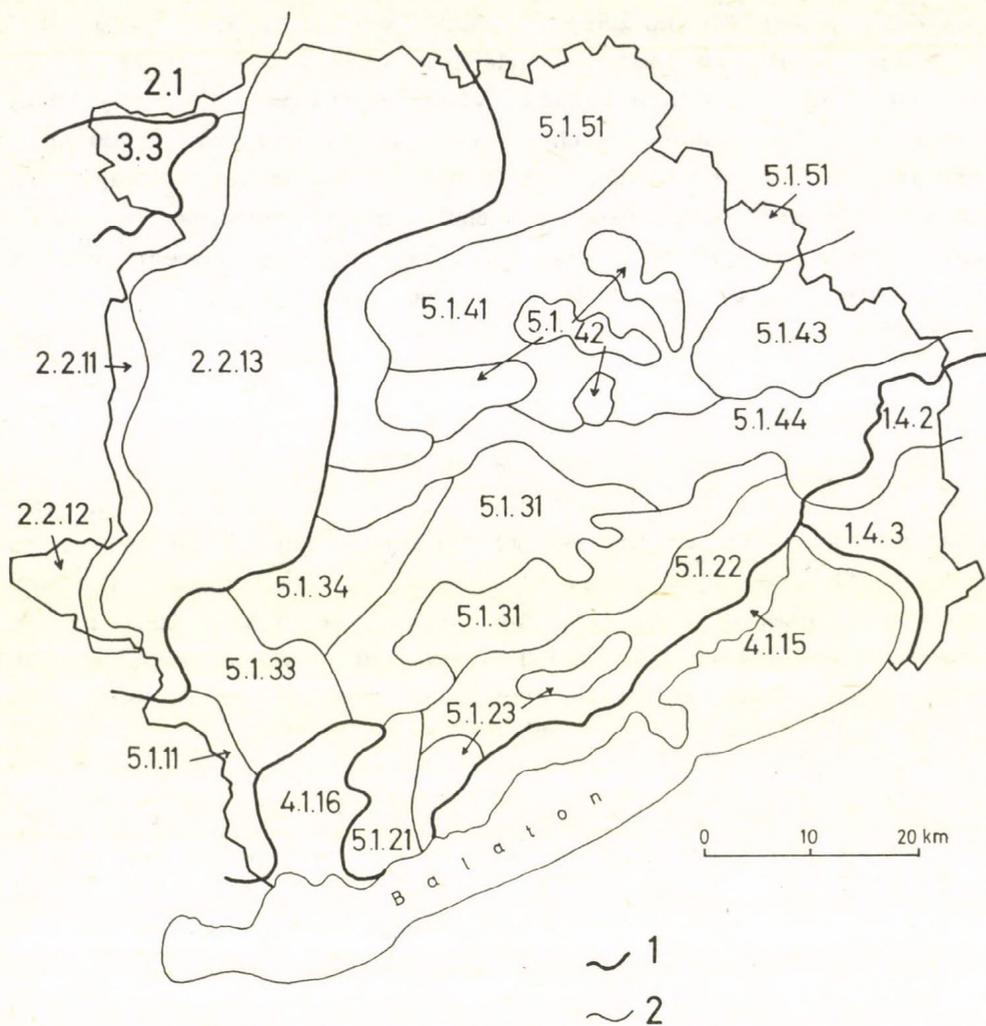


Fig. 4 Physical geographical divisions of Veszprém county (after M.Pécsi and S. Somogyi).

1 = boundary of macro- and mesoregions; 2 = boundary of micro-regions. 1.4 = Mezőföld plain; 1.4.2 = Velence basin; 1.4.3 = West-Mezőföld; 2.1 = Győr basin; 2.2 = Marcal basin; 2.2.11 = Marcal valley; 2.2.12 = Kemenesalja; 2.2.13 = Pápa-Devecser plain; 3. = Kemeneshát; 4.1 = Balaton basin; 4.1.15 = Balaton Riviera; 4.1.16 = Tapolca basin; 5.1 = Bakony Mountains; 5.1.22 = Balaton Uplands hills; 5.1.23 = Balaton Uplands basins; 5.1.31 = South-Bakony basins; 5.1.32 = South-Bakony mountains; 5.1.33 = South-Bakony hills; 5.1.34 = Devecser foothills of South-Bakony; 5.1.41. = Old Bakony; 5.1.42 = North-Bakony basins; 5.1.43 = East-Bakony; 5.1.44 = Veszprém-Devecser graben; 5.1.51 = Bakony foothills

The most economic areas for the supply of existing or projected food processing plants can be delimited on the basis of land capability and agroecological microregions.

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CO-OPERATIVE FARMS AND THE UTILIZATION OF THE PHYSICAL ENDOWMENTS OF THE LAND

É. PERGER

INTRODUCTION

Research activities, concerned with the evaluation of natural factors in respect of the optimal geographical distribution of crop cultivation, have been renewed in Hungary since the mid-1970s. Since then, certain new features of economic policy have also encouraged the improved utilization of the physical endowments. The reason why the topic has come to the fore is two-fold. Firstly, the illusions cherished at the beginning of the collectivization of agriculture, whereby organizational and technical change would reduce natural factors to negligible significance, have been shown to be unfounded. Secondly, the success of Hungarian agriculture and its importance in the export trade of the country have also focussed attention on maximising ecological potentials.

Both researchers and managers complain, time and again, about the meagre results that their efforts have achieved. The main reason for this disappointment is the fact that the farms (80% of the agricultural area is owned by co-operative farms, while the remainder is largely in the hands of state farms with very little land owned by private farmers)

only utilize and conserve their natural potentials optimally, if appropriate financial incentives are offered.

In this study an analysis of the available literature and empirical research have been used to assess to what extent the relationship between co-operative farms and their physical geographical endowments is determined by self-interest. Specifically, are the decisions of co-operatives motivated by a need to utilize their natural resources, and do they show any real interest in conserving favourable endowments and relieving constraints?

SOCIOECONOMIC ENVIRONMENT OF THE HUNGARIAN AGRICULTURAL CO-OPERATIVE FARMS

Since agricultural co-operative farms are first and foremost economic organizations, the scope of their activities is mainly determined by the socioeconomic environment created by economic policy (*Fig. 1*).

1. Market or centralized management?

In a pure market economy, adjustment to physical geographical potentials is an essential precondition for successful management because this is the only way to maximise differential land rent. However, nowhere can we speak of a pure market economy today although among the CMEA countries market factors are probably given their fullest reign in Hungary. The balance between a centrally planned economy and the influence of the market has changed over time. As a result, the climate within which agricultural co-operative farms must operate has undergone continuous modification, necessitating a process of adjustment to the natural potentials.

Theoretically, a centrally planned economy does not encourage considerations of local conditions as part of an area's physical potentials. Local conditions, of course, are best known locally and not by the district, let alone the central, administration of the county. Given this, it will only be by chance that national programmes agree with

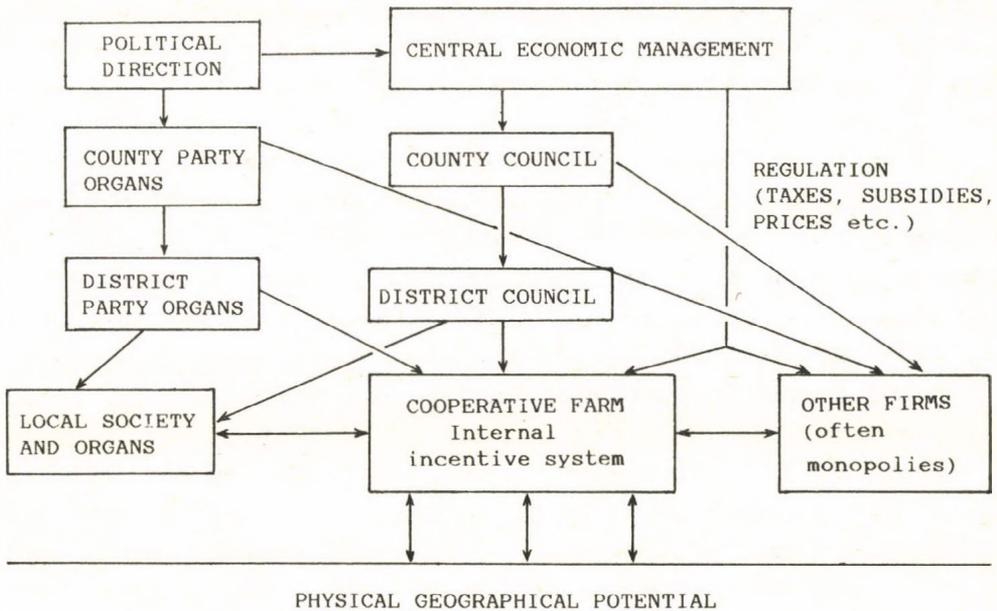


Fig. 1 The interrelationships between co-operative farms in Hungary and the socio-economic system

the optimal development aims of certain agricultural co-operative farms, this will only be by chance.

In the short term a market solution does not necessarily optimize the utilization of natural potentials either, but self-reliance does facilitate the consideration of local characteristics. Although market factors may encourage the cultivation of crops that are not necessarily best suited to a given area, the requirement of economic efficiency nonetheless precludes the growing of absolutely unsuitable crops in the long run.

In the years prior to 1967 when, in accordance with political guidelines, agricultural production was planned and district administrations virtually specified the cultivation structure of co-operative farms, adherence to natural potentials was necessarily limited. The situation was reinforced by the widespread small-holder tradition of subsistence farming.

After 1967, co-operative farms found themselves in a difficult situation for, although the system of production planning had been terminated and administrative measures were now rare, the old system still lived on in the form of alternately strong, and then weak, expectations on the part of the state administration. Simultaneously, a new requirement, that of economic efficiency within the framework of a controlled market, emerged. This not only meant obligations but also created certain freedoms, including a declaration of self-reliance, the possibilities of enlarging the range of activities, the freedom to purchase machinery from independent sources, an increase in the level of agricultural prices, the release from debts and the subsidization of investments. These, in turn, meant that it was now possible for farms to make their own independent decisions and to undertake independent farming (at least for a certain range of co-operatives). However, this new independence was partially reined in at the beginning of 1971, and was further constrained in 1975, although these administrative requirements were again relaxed after 1979.

However, despite these changes, it is nonetheless the case that the influence of the centralised economic policy has been felt throughout the period under question. The major means of interference have not only been direct orders, pressure and expectations, but also regulations and other influences of the socio-economic climate. The most important of these is the maintenance of agricultural prices at an artificially low level. From this point of view the economic health of the co-operatives tended to deteriorate throughout the 1970s and into the 1980s, since the price gap widened continuously to the disadvantage of agricultural producers. Since this meant that accumulated net income was inadequate for development, co-operatives received compensation in the form of grants, the cancellation of debts, and the subsidization of operations and investments. These were generally connected to a given development aims which, again, has meant the state having a direct influence on decision making.

The subsidy system itself is very complicated. The applied instruments are various, and the range and extent of subsidies are changed almost every year, with the consequence that the opportunities of co-operative farms for planning and foresight are limited. Moreover, subsidies have not fully compensated for the loss of income due to the low agricultural price level. Indeed, in many years during the early 1970s and in the mid-1980s the value of subsidies paid out by the state did not exceed the amounts paid to the exchequer by the co-operative farms. Nevertheless, the system of "applying for" subsidies expressly encouraged administrative management. The independence of co-operative farms is also limited by the way in which the market operates in Hungary today. The co-operatives, as either buyers or sellers, cannot be free partners in the market since they face the big enterprises who generally have a monopolistic position in supplying and selling spare parts, machines and fertilizers. They therefore need the "goodwill" of these enterprises as well as that of other organizations, especially those associated with the party and the state, who in turn are capable of influencing the decisions and behaviour of the enterprises.

2. The effects of regulating the system

The survival of a central administrative influence, which, although changing, has remained powerful at all times, has created a situation which does not encourage the full utilization of natural endowments. In spite of all endeavours, the regulating system and the actual means of regulation have often hindered the adjustment to natural conditions. The frequent change and complexity of economic regulations, the increased taxation on accumulated wealth and the requirement to undertake industrial-type production have all encouraged co-operative farms to concentrate their efforts on 'safe' mainly non-agricultural activities. In such a climate, sectoral and cultivation structures are necessarily simplified and production that has proved economically ef-

ficient in the long run is emphasised. It is, of course, the pricing and subsidizing systems that determine the profitability of different farming enterprises. Profitable crops are worth cultivating even if the soil and climatic conditions are not fully suitable and, conversely, agricultural activities are best abandoned even when the natural conditions are favourable. The difficulty surrounding animal breeding penalises especially those co-operatives with inferior land because cattle and sheep breeding would be the activity best suited to their rolling terrain and alkali soils.

The support that is given for the growing of certain field crops, notably sunflowers, wheat and lucerne, may lead to the exclusion of other branches of cultivation that are better suited to the natural conditions, and may encourage monoculture, with the risk of damaging the soil and increasing the danger of erosion.

Substantial changes in the profitability of fruit growing are especially risky, as the wholesale clearing of orchards may entail a serious loss of national wealth. In this context, it should be remembered that the climatic conditions in Hungary are especially favourable for fruit growing.

Changes in the manner in which the incomes of enterprises and individuals are regulated may also limit the adaptation to the natural conditions. The system of sharply progressive taxation together with other factors has reduced the ability of co-operatives to invest from their own resources and, as a consequence, investment for restructuring or for soil amelioration has been very limited. The only investments to make economic sense are those which are strongly supported centrally, on which there is a rapid return. It is only by chance that such investments coincide with the natural endowments of co-operative farms.

Due to the heavy taxation of personal incomes, co-operatives are not interested in cultivating labour-intensive crops. This can obviously hinder the full exploitation of the physical conditions in regions which are best suited to the growing of vegetables and fruit.

The regulating system does contain some elements which are designed to promote adaptation to the natural conditions, such as subsidies for amelioration, afforestation, and grasslands. However, it has to be said that these measures are not able fully to compensate for the adverse effects of the system of economic regulation as a whole, and any advantages that accrue from them are strictly limited.

3. Local conditions, the structure of internal interests

The management attitudes of co-operative farms are also influenced, although to a minor degree, by local circumstances. Today co-operative farms in Hungary are not only economic institutions but, in the under-industrialized parts of the country, the lives of the agricultural co-operatives and local settlements are closely knit. Due to the requirements of villages for goods and services, as well as the organization of household farming together with other aspects of the local policy, agricultural co-operatives are likely to perform activities that are rather divorced from their natural endowments. These activities are important because they fill the gaps left by the decline of other communal and social institutions of the villages. Moreover, even in the early 1970s the production structure of the co-operative farms was greatly influenced by the tradition of subsistence farming and by the need to employ large amounts of female labour, which may have limited the full utilization of the natural endowments of each co-operative. Although these features are now less pronounced as a result of labour re-organization, other new tensions have appeared as a result of the growing plant size and the extension of the range of activities, which have increased the likelihood of internal conflicts of interest. These conflicts can directly influence product structure, since the stronger units can attain control over their own activities, as well as hindering the development of others.

The whys and wherefores of the utilization of natural endowments also depend crucially on the internal incentive

system. Useful in this respect are those financial incentives which gear personal income to the crop grown and simultaneously encourage the careful treatment of the physical environment (shared cultivation, allocation of animals for breeding, forms of group enterprises, etc.). In many settlements, small-holder farming might be the most appropriate utilization of the natural potential, especially in those parts of the country where there are no large, unbroken tracts of agricultural land. The optimal utilization in such cases could be promoted by the agricultural co-operatives organizing household farming, granting farming leases and parcelling out arable land.

EMPIRICAL STUDIES

The theoretical assumptions based on an analysis of the relevant literature have been supported by two case studies. The two co-operative farms selected contrasted strongly with each other. One had average, whereas the other had unfavourable natural endowments; while one was an outstanding farm the other had been faced with problems of profitability for several years. The only common feature was that both had been formed through merger and covered extensive areas.

The empirical examination has substantiated the presumption that natural endowments do not directly affect decision-making about the cultivating systems of agricultural co-operatives. Rather, they only take ecological circumstances into account when it is in their interests to do so, and this has not happened very often since 1967.

The empirical research has indicated that the most important role played by physical endowments of farms lies in obstructing those changes in the product structure that would be most appropriate under a given set of socio-economic circumstances. It is also evident that the contradictory requirements of a centralised economic policy, on the one hand, and a market mechanism, on the other, are closely connected in reality. Rapid adjustment to central programmes increased income through attracting preferential treatment

including subsidies; it also made cultivation safer and more efficient economically; and at a later time the good results thus achieved became reference points for the granting of further preferential treatment. Investments to improve market position, such as the expansion of storage and processing capacities, were only made possible by obtaining credits through 'good' connections with the state organs or by the managements negotiating agreements with the powerful purchasing monopolies.

1. *One of the agricultural co-operatives* studied successfully realised both tasks and today covers an extensive area of 8084 ha which embraces three villages and three separate geographical areas with very different natural conditions.

The decisions of this co-operative were very loosely motivated by their experience that would only come out well if they participated in central programmes. As a result they joined every state campaign which were, in chronological order: irrigation, vegetable and fruit growing, sugar beet cultivation, introduction of pig breeding, development of cattle breeding, introduction of vineyard cultivation, afforestation, soil amelioration, the development of grassland and animal husbandry, a sheep breeding scheme, a grain programme, a further scheme encouraging the growing of vegetables, the construction of storage and processing facilities, an energy-saving programme and the introduction of natural gas. They also consistently changed their range of important activities annually, following faithfully the changes in regulating system. If one kind of subsidy was terminated or reduced, that particular enterprise was also closed down or reduced in importance. Joining central programmes made production both economic and safe. In return they could also maintain activities that were unsuited to the physical conditions or unprofitable, as they conformed with central 'expectations'.

Since the beginning of the 1970s, the activities of the farm have also been geared to the conditions of the regulated

market. The first sign of this was a simplification of the product structure in 1971-72. Later they attempted to maintain the domination of the more profitable enterprises, the most significant evidence of this being the analysis of the expenses and yields of each branch they carried out from 1976 on. The most important adaptation to the market has been the extension of their storage and processing capacities, including fodder mixing and lucerne flour plants, together with the introduction of natural gas to increase economy. All of these investments were supported by a mixture of preferential state subsidies or loans, plus their own resources which were ploughed in from the successful results of previous years.

Since 1980 the situation of the co-operative has changed slightly and they have not been able entirely to avoid the effects of a more restrictive economic policy. Their tax burdens have continued to increase while the level of subsidies has been decreasing. However, the management of the farm and the 'supporting' organization have still managed to obtain favours, including the addition of new land with good physical potential in 1978. Moreover, they were also permitted to modify their grape and fruit growing areas for which they received a loan from the state, and were also allowed to experiment with a new means of personal incomes.

However, there were also difficult experiences, such as the failure to receive subsidies for soil amelioration, and the crisis in the marketing of grapes in 1983, as well as the adverse effects of the recession in food exports. The response to the stricter conditions was a strengthening of market attitudes. Unprofitable enterprises, specifically beef cattle rearing, fruit cultivation, part of the vine cultivation and field experiments, maintained for other reasons were terminated, while auxiliary activities were strengthened.

The natural endowments of the three areas comprising the co-operative allow for a wide range of crop and animal enterprises and do not therefore restrict the co-operative in

any way in adjusting its production structure to the changes in economic policy. Attitudes towards the physical potentials changed in tune with the modifications to the structure of production and crop cultivation brought about by the adjustments to the political and economic climate.

2. *The other agricultural co-operative* studied has not been able to adjust rapidly to either central programmes or to changing market requirements as its land is only suited to cattle and sheep rearing. Under the present system of regulation, it cannot improve its results unless it can make itself independent of the constraints imposed by its natural endowments. Its situation is made all the worse for the superposition of disadvantages. It is far away from the nearest administrative centres, isolated from the main lines of communication, and has no infrastructure worth mentioning. On the one hand, the need to reduce arable land, which is being encouraged centrally, suits the co-operative but, on the other hand, the programme to improve the quality of sheep rearing, does not. Development trends suited to the natural endowments of co-operatives like this one are suggested in vain, if these developments cannot be profitable due to the system of regulation and other local conditions.

Although the various possibilities are subject to the independent decision of the co-operative farm, they are still limited by their natural potential and the low level of financial resources. Indeed, the financial position of such co-operatives is so strained that considerable difficulties arise even if the position of one enterprise is weakened within the market. Under the rapidly changing circumstances of today, everything is risky for them. If new developments are based on central subsidies, they may well be forced to continue with the activity even if at a later date it produces a deficit. (This did in fact happen with sheep and cattle rearing on the co-operative studied.) If activities with only a temporary niche in the market are improved, the profitability of such enterprises may be reduced by the time the investment has come to fruition, as happened on the co-operative studied in the case of poultry farming and some indus-

trial activities. On the other hand, in lacking capital, they cannot accomplish large-scale investments, and the special subsidies given to co-operative farms are too small to eliminate this disadvantage.

In this difficult situation, the attitude of the co-operative farm is characterized by trying to make use of temporary possibilities and favours. It is the job of the president of the farm, appointed by the County Council, to find these possibilities. However, as the only possibilities are in the agricultural field, they could not find a profitable enterprise outside agriculture and for this reason they cannot achieve any independence from their natural endowments. Since their potentials are suitable for a few activities only, they are disadvantaged by frequent changes of policy and cannot benefit from them.

In spite of the circumstances there have also been positive changes from the point of view of the more effective utilization of natural endowments since 1979. One important change, which brought favourable results, has been the initiation of a new concept in co-operative farm management, whereby household farming activities are now more organized, including the letting of garden plots, and the small-scale rearing of sheep.

A new kind of co-operative farming is emerging, which not only involves large-scale cultivation but also the organization and co-ordination of various agricultural activities performed by individuals or by groups. This concept well suits the natural endowments of the land since it provides an opportunity for the efficient cultivation of small tracts, and the rational utilization of pastures.

Changes in economic policy are well exemplified in the history of agricultural co-operatives in Hungary. It is also evident that the periods during which the central direction of economic policy was strongest resulted in less attention being paid to the physical potential of the land. Since 1979, however, adjustment to the natural endowments has improved, for two basic reasons; on the one hand, market factors have

played a greater role in influencing decisions about product changes, investments and financial incentives; on the other central economic policy has acquired a positive attitude in respect of the necessity to adjust to the physical potentials that the land has to offer.

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AN ASSESSMENT OF THE TOURIST
POTENTIAL OF THE
PILIS-VISEGRÁD MOUNTAINS

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INTRODUCTION

The Danube Bend is second in importance only to Lake Balaton as a recreation area in Hungary. Its favourable physical endowments and attractive settlements are re-inforced by its nearness to Budapest, which has a population of 2,000,000 and is the only tourist centre of international stature in the country.

The Geographical Research Institute of the Hungarian Academy of Sciences chose the southern part of the Danube Bend as a test area for mapping environmental quality. The area forms part of the Pilis-Visegrád Mountains which stretch for 60 km along the Esztergom-Budapest section of the Danube. The investigation, which used mainly cartographic methods, was headed by László RÉTVÁRI.

In the examination of this extremely heterogeneous meso-region, the primary objective was to analyze the individual physical and socio-economic characteristics of the area and to represent them on maps, in order to provide an objective portrayal of the present state of the environment. This comprehensive analysis of present conditions was also motivated by the projected Danube barrage at Bős-Nagymaros, a joint Hungarian-Slovak venture, which will fundamentally alter

the appearance of the settlements along the river if implemented. The team prepared 46 different maps of the area under study, most of them at a uniform scale of 1:50,000 to allow for easy comparison. However, certain target maps were drawn at the more detailed scales of 1:10,000 or 1:5,000.

This brief paper covers only a part of the inter-disciplinary survey and concentrates on the abiotic resources and potentials of the area and their representation on maps. The elements of the physical environment that determine recreational potential were summarized from the available literature and other documentary evidence as well as from data collected during field work.

ASSESSMENT OF PHYSICAL FACTORS

1. Topography

The Pilis (757 m) is the highest and the most northeastern peak of the Transdanubian range; geologically it is a horst of Triassic limestones and dolomite. The adjacent Visegrád Mountains, 700 m in altitude, is composed of Miocene volcanics, and is similar to the Börzsöny Mountains on the opposite bank of the Danube.

These two mountain units, highly different in terms of both geology and geomorphology, have been represented on three thematic maps, each showing specific geomorphological features.

a. Nine categories of *relative relief* have been represented on a kilometre square grid map. The lowest values (0-50 m) are found along the margins of the Danube valley, where the land affords favourable opportunities for settlement expansion. The highest values (350-400 m per sq km and over) occur along the steep scarp of the Pilis summit and around the presumed eruption centre of the Visegrád Mountain, within the former caldera.

b. The map of *slope exposure* identifies categories according to the four primary and four secondary points of the compass. For easy printing on the published map, arrows have been substituted for colours and indicate slope direction.

Prevailing slope directions are sharply different on the two mountains: in the Pilis area SW-NE slopes predominate at right angles to the narrow ridges separated by faults while the valleys are tectonically aligned. In the Visegrád Mountain, south of the Danube, the remnants of the double caldera are clearly recognizable. The map of slope exposure helps to identify areas favourable for winter sports, particularly those of northern exposure suitable for downhill skiing. The longest run with the greatest drop of 200 m has been built on the steep northern slope of the Dobogókő. On the outskirts of settlements, for instance around Szentendre, southern slopes favour viticulture and fruit production.

c. The *map of tourist paths* classifies different sections by varying degrees of steepness. Six categories are recognised, from 'easy walking', a slope of angle of 0-5°, to 'very difficult', with slopes above 25°. In this way path sections with different walking conditions may be distinguished. This map is useful for hiking as it allows the most appropriate routes to be chosen.

2. *Climate*

The *climatic* survey of the Pilis-Visegrád Mountains used data from meteorological stations and other observation sites located both within and along the mountain margins. In respect of geographical location, the area serves as a link between the Transdanubian and the Northern Mountain ranges and also marks the dividing line between the Great and Little Hungarian Plains. In spite of its low elevation the climatic range is greater than in the foreland or along the Danube valley. This is seen on the *map of winter and summer temperatures*. During the summer, mean monthly temperatures are approximately 4-4.5°C lower than in Budapest, and this is especially favourable for recreation. Thus while Budapest has 10-15 days with maximum temperatures above 30°C, at the altitude of Dobogókő (700 m above sea level) this number falls to below five days.

A separate map was drawn to show the climatic parameters important for winter sports, using interpolated data for the mountains based on altitudinal distribution. It is clear from the map that the average *duration of snow cover* rises from 40 days along the lowland margins at an altitude of 100-150 m to 80 days at about 550 m and exceeds 90 days on the summits at Dobogókő and Pilis. Consequently, about 90 days of snow cover can be expected for the Dobogókő ski run, dropping to 60 days for the Nagyvillám run near Visegrád. With each 100 m increase in altitude the number of days with snow cover rises by 9, while the first day of snow, on average, comes 4 days earlier and the last day of snow 7 days later. The snow accumulated during winter melts one and a half months later in the highest regions than along the margins.

The probability of winter snow cover is greatest in February, and maximum thickness is attained in the same month. It should be noted that at least 10 cm of snow is needed for skiing. In late winter the higher declination of the sun produces earlier snow melt on southern slopes, and the snow line may therefore differ by as much as several hundred metres between northern and southern slopes.

Over the three winter months the duration of *sunshine* is only 190 hours on the margins below 200 m altitude, while at the summit levels of Dobogókő and Pilis at around 700 metres this increases to over 240 hours. The gradient of hours of sunshine generally rises by 10 hours per 100 m of elevation during winter, and is very important for recreation, winter sports and medical treatment. The amount of winter sun at Dobogókő is only slightly less than at such well-known mountain resorts as Kranjska Gora, Yugoslavia at 800-900 m above sea level, or Zakopane and Tatra-lomnic in the High Tatras. The view from the Dobogókő viewpoint in winter sunshine is also appreciated, and the mist in the valleys with the surrounding peaks standing out as islands forms pleasant visual impressions.

3. Waters

The *drainage* system of the Pilis and Visegrád Mountains forms part of the Danube catchment and has been represented and assessed on a complex map. The relatively small areal extent and subdued relief have only allowed small streams of limited discharge to develop, although the differences in geological structure between the two mountains affect permeability and runoff. Most of the rainfall infiltrates into the limestones and dolomites of the Pilis and accumulates at depth as karst water and as a consequence springs there are usually more abundant and have a greater discharge than those in the Visegrád Mountain which is of volcanic origin.

Some of the physical characteristics of the Danube and of the smaller water-courses have also been portrayed on the map. Following the usual Hungarian practice, *water quality* has been categorised into four grades: Grade I - pure, Grade II - slightly polluted, Grade III - polluted and Grade IV - severely polluted. Where the data have allowed, the minimum, average and maximum salt content have also been indicated. The water quality of the Danube is not suitable for swimming, but favourable conditions exist on its broad surface for other water sports - including motor-boating that is banned from Lake Balaton.

The data shown for the various *water-courses* include length in kilometres, catchment area in square kilometres, low, medium and peak discharges in cu. m per sec and the months in which they may be expected to occur. For the Danube, the central water section is shown in metres, current velocity in metres per sec and depth in metres. The difference between mean low water and mean high water as well as the highest water level are also indicated on the map, together with the minimum, median and maximum water temperatures of the warmest month. Dominant river processes have been indicated by symbols viz. A = aggrading, B = degrading, C = graded equilibrium. In addition, opportunities for bathing and maximum navigable draught have been recorded on the map.

The *springs* in the Pilis-Visegrád Mountains, although generally of low water yield, have also been mapped. The underground waters of karst origin on the margins of the Pilis are of much greater importance, particularly for drinking supply and for this reason their discharge and temperatures have been indicated on the map. Thermal waters which rise from the deeper limestone and dolomite strata of the basement are of outstanding importance for tourism. The Esztergom spring with a water temperature of 26°C falls into the class of lukewarm springs, while those at Visegrád (38-46°C), Leányfalu (54-65°C) and Szentendre (35-42°C) are classed as warm. Average discharge ranges from 260 to 1350 litres per minute.

The mineral composition of the thermal springs of the Danube Bend also makes them suitable for use as medicinal waters and the warm and lukewarm baths associated with thermal wells are great attractions. The water quality of artificial lakes like those in the former gravel pits at Omszk park on the outskirts of Budapest is unsatisfactory, and they are only suitable for sports like wind-surfing.

The comprehensive hydrological map therefore suggests that the hydrographic potential of the Pilis-Visegrád region as a whole is favourable from a number of different aspects. The Danube, the largest river in Central Europe, makes a considerable contribution to the generation of tourism in the region.

4. *Scenery*

A new type of assessment map was also drawn up to evaluate the scenic view-points of the region. Detailed field work enabled us to assign scores to each view-point based on the angle of view - the circular view from each point - and the natural curiosities, such as characteristic cliff profiles and deep gorges, and anthropogenic features, castles or settlements, which can be seen from each point. In addition, the accessibility of the most important 24 view-points by car was evaluated as the walking distance from the nearest public road or car park to the view-point.

In this brief report we have only been able to describe a selection of the various thematic maps that have been produced. They include traditional maps and those based on entirely new concepts. The recording and assessment of different environmental factors has thrown light on several of the relationships that are an essential part of the recreational potential of the area. At the same time, it has to be emphasized that only complex investigations that also incorporate socio-economic potentials can provide an integrated synthetic assessment of environmental quality. Further research is needed to achieve this goal.

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URBAN AND RURAL SETTLEMENT

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URBAN GEOGRAPHY: RETROSPECT AND PROSPECT

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This paper reviews the development of one specialism, urban geography, since the mid-1950s and shares some thoughts about the future, in effect whether urban geography in the 1990s? There is an inevitable Anglo-American emphasis in the survey because that has been a characteristic of post-1950 urban geography in Britain. The following comments are not intended to be exclusively restricted to the British scene, indeed I believe that they do have wider validity, but the primary locus of the analysis is Britain.

As JOHNSTON (1979 p. 5) has noted, the content of an academic discipline cannot be fully discussed without examination and understanding of context. For example, the rapid expansion in the 1960s of the number and size of Geography departments in British universities, followed in the 1970s by a corresponding growth in polytechnics, greatly facilitated the diffusion of geographical specialisms, including urban geography. The current threat of a reduction in the number of Geography departments may also enable, encourage or precipitate a review of the availability of different geographical specialisms. Thus, the story of the development of urban geography in recent decades has been acted out against a backcloth of major contextual change. An understanding of context introduces other facets of academic life such

as the selection of research topics and of research methodologies, the policies of research councils and editorial boards, the 'rules' governing promotion in the system and the importance of peer networks for peer reviews. The development of the philosophy of a discipline is not a clinical abstraction but the outcome of a complex interplay of subjective and objective factors, of chance and opportunity, in which academic networks play an influential role.

If in the late 1950s the question had been posed of urban geography, 'How is the patient, doctor?', the answer would have been 'Growing rapidly'. At first inspection the response in the late 1980s would also be encouraging. For example, the Urban Geography Study Group of the Institute of British Geographers can approach its silver jubilee heartened by the fact that it is the largest of the specialist groupings recognised by that body. An analysis of the research interests of the members reveals that a wide range of topics are studied under the broad title of urban geography. However, there are major philosophical and methodological differences which divide modern urban geographers, as they do in other fields of human geography. In the 1960s when urban geography in Britain was arguably the leading specialism within human geography, it remained linked to geographical tradition by concentrating upon a particular spatial entity - the city. Now the different approaches threaten a sense of unity of interest or purpose. Recently GREGORY and URRY (1985) have argued for the adoption of social theory as an explanatory vehicle. Whilst not inherently aspatial, social theory does not possess the long-standing spatial tradition which is a primary unifying focus of geography. If such unity is deemed essential, would an emphasis upon environment provide a means of collecting together the various approaches which presently characterise the specialism?

The following retrospective section outlines the development of urban geography in Britain during the last thirty years. The concluding discussion about the future scope and nature of the specialism is set within the context of the likely challenges facing higher education in Britain in the 1990s.

RETROSPECT

Reviewing the scope and status of urban geography in 1948, R.E. DICKINSON remarked that the subject was concerned with much more than the physical ground plan of the city and that numerous empirical studies displayed the scope and special techniques of the subject. Interestingly DICKINSON also observed that the trained geographer was equipped to deal with particular problems of social and physical planning. He argued that urban geography was concerned with four problems; the physical and cultural origins of settlements; subsequent functional and morphological development; the life and organisation of the modern settlement, in aggregate and in terms of sub-areas, and the relationships between settlements and their hinterlands. Thus DICKINSON identified the strands of origin, development, morphology, function, internal structure and service area - central place relationships. Although he was an early Anglo-American adopter of the central place postulations of W. CHRISTALLER (1933), DICKINSON (1948) recognised that the social ecological interpretation of the Chicago School offered interesting perspectives. However, he stressed that urban geographers were concerned with the differentiation of the urban settlement into functional areas and social groupings as expressed in the use and structure of buildings. DICKINSON also referred to sociological studies of crime and of the distribution of social maladjustment. He implied that such studies were more properly the province of sociology and explicitly stated that sociologists were more concerned with, and better equipped for, the study of neighbourhood and community areas. DICKINSON concluded by noting the increased importance of geographical and ecological studies of urban areas in Western Europe in the rising post-war tide of planning surveys and initiatives.

Many later surveys of the evolution of British geography tend to underestimate the importance of the planning-oriented work which occurred in the 1940s, thereby slightly mistiming the paradigm shift in human geography which culminated in the supremacy of the positivist approach. The paper by SCHAEFER

(1953) is widely acknowledged in retrospective surveys as the expressed catalyst for the paradigm shift, a clear statement of the need for scientific geography to follow a nomothetic approach and seek laws. The present paper need not develop an analysis of SCHAEFER's views or HARTSHORNE's responses (1954, 1955, 1958, 1959), that has been thoroughly conducted by JOHNSTON (1979). The purpose of the remarks is merely to remind ourselves that from the 1930s onwards a few urban geographers did use the models of CHRISTALLER and BURGESS which became distinctive symbols of the nature of urban geography during the positivist era. However, the spirit of the change of purpose was captured by MAYER and KOHN in the introduction to Section 1 of their influential volume 'READINGS IN URBAN GEOGRAPHY' (1959, p.5):

"Today the urban geographer commonly approaches his study from two different points of view. First, he considers cities as discrete phenomena in the general fabric of settlement of the entire earth, or a major part of it. As such, they can be analysed geographically in much the same ways as any other phenomena similarly distributed. Concepts and generalisations may be formed regarding their distribution, size, function, or rates of growth. Areas served by urban places may be delimited, and the spatial interactions between urban places, inside or outside the delimited tributary areas, may be studied. Within the past few years several papers in urban geography have contributed significantly to theoretical notions regarding the functional base of central places, the size and spacing of cities within selected areas, nodal regions, and other geographic considerations".
p. 5.

In these remarks MAYER and KOHN correctly identified the trends in terms of the topics and approaches which would dominate a large part of urban geography in the 1960s. They were less perceptive in the topic which was identified as the second major approach, namely urban morphology. Notable studies were undertaken such as the seminal morphological research on Alnwick, Northumberland by CONZEN (1960), but the approach was not at the forefront of positivist urban geography. However, MAYER and KOHN included 'concepts and generalisations related to the character and intensity of

land use within the city' (p. 5), in their definition of morphology, thereby incorporating economic and ecological studies of internal structure and sub-areal differentiation of cities which did become the second major component of the specialism in the 1960s.

'READINGS IN URBAN GEOGRAPHY' contained 54 papers, which were grouped into 18 sections dealing with approaches to the subject, basic areal definitions, the rise of cities, the economic base concept, functional classification, population studies, central places, the size and spacing of cities, land-use survey and mapping techniques, city structure, transportation, ports, the commercial structure and the CBD, industry, residential areas, the urban fringe, water supply and blight and renewal. Thus, MAYER and KOHN recognised the diversity of interest of urban geographers and other students of urban settlements, a feature later described by ROBSON (1973) as the eclectic role adopted by urban geographers. Two further features of the volume were the range of disciplines represented in the contributions and the fact that a few seminal articles antedating 1940 were included.

Diversity of interest and borrowing from other disciplines continued to feature prominently in British urban geography in the 1960s and 1970s. The topics covered in an introductory text book by JOHNSON (1972) illustrate the tradition derived from the late 1950s: factors in urban growth; urban society and urban form; demographic characteristics of urban populations; occupational characteristics of urban populations; the location, spacing and size of urban settlements; the city centre; residential suburbs; manufacturing areas in cities; theories of urban structure. However, as MAYER and KOHN predicted, the principal thrusts of research activity were associated with aspects of central place theory and with analyses of the internal structure of cities.

JOHNSTON (1979, pp. 74-79) has recounted the role of the Cambridge department in fostering the diffusion of the 'new' geography in Britain through volumes such as 'FRONTIERS IN GEOGRAPHICAL TEACHING' (CHORLEY and HAGGETT, 1965) and 'MODELS IN GEOGRAPHY' (CHORLEY and HAGGETT, 1967) but reference must be

made to other training grounds of the 'new' urban geographers such as the Aberystwyth department where H.CARTER's courses (largely embodied in the influential textbook 'THE STUDY OF URBAN GEOGRAPHY' 1972) apparently exercised a powerful effect upon a succession of students who subsequently became leading urban geographers. The contents of a festschrift to E.G. BOWEN edited by CARTER and DAVIES (1970) provided a valuable insight into the research interests of that Welsh School of urban geographers: approaches to urban geography, two studies of urban connectivity; substandard housing in Welsh towns; a decision-making approach to townplan analysis; a principal components analysis of the urban social structure of Cardiff and Swansea; a multivariate analysis of socially disorganised areas in Barry; suburbanisation in rural Wales; a small town community in Mid-Wales; towards an integrated study of central places; the central place pattern of Mid-Wales and the Middle Welsh Borderland; urban problems in Wales. Moreover, that list faithfully reflected the contemporary British dominance of studies of central places and of aspects of the social geography of cities in which various researchers took established models and investigated them in particular spatial, temporal and cultural contexts.

The exponents of the 'new' geography adopted the procedure of scientific investigation, emphasised the role of spatial analysis and, to varying degrees of sophistication, used computers and statistical techniques to resolve their data and test the results for significance. One consequence was a process of progressive specialisation with few urban geographers doing research into more than one major aspect of the subject, thus mirroring at specialism level the centrifugal tension which was affecting the discipline. Unity was now sought by procedural convergence and common philosophical purpose but, at best, that was an uncertain path. Sub-specialist interaction with other disciplines was just as likely to encourage diversity of procedure and even of philosophical stance since perfect cross-disciplinary matching on these matters between social sciences is a rare event.

Much of the 1960s research referred to above led to some modification of the positivist approach to urban topics as residuals remained unexplained, theoretical assumptions proved incorrect or empirical studies reordered the importance of factors and suggested fresh areas of research and identified lacunae in our knowledge. It can be argued that one phase of research contributes directly to the shift in emphasis or technique of the succeeding period. The initial wave of central place research generated even more sophisticated network and connectivity studies, but it was also followed by a greater attention to behavioural analyses of shopping patterns. Similarly, the early residential studies can be cited as the father of later factorial ecologies and some of the problem oriented investigations of social dimensions such as housing standards or crime were not the produce of wayward sons. Indeed, in some cases this pattern describes the course of development of the research interest of an individual. Thus HERBERT started by conducting a socio-ecological study which investigated the models of BURGESS and HOYT, then adopted the technique of factorial ecology before specialising in the geography of urban crime.

The relative weighting of continuity and change is problematic and perhaps inevitably subjective. WHITEHAND (1973) analysed the changes in undergraduate courses on urban geography in British universities using responses from surveys in 1965 and 1972. He observed that

"While for courses entitled 'urban geography' the basic frame of reference tends to be that of the mid-sixties, radical courses in which urban geography is sub-theme virtually all owe their basic conception to the period since 1965. It is clear from this that to concentrate attention only on innovations in courses entitled 'urban geography' would be to considerably underestimate the total extent of change in this branch of geographical teaching. It may well be that both the most rapidly growing and the most innovational part of the geographical interest in urban studies is being channelled into other courses (p. 198)."

In his study WHITEHAND uses radical to equate with innovative in relation to the adoption of 14 educational aspects

covering increased use of computing, statistics, lectures, personal sources of information and unpublished research, greater emphasis on theory, systems paradigms and solving planning problems and innovative methods of teaching and assessment. Five shifts in content were specifically identified; reductions in the time devoted to morphogenetic and land use studies, increases in the time devoted to the study of social areas and to the topic of spatial planning and the introduction of the themes of space-time budgets, spatial diffusion, forecasting and perception studies. Apart from revealing a shift in the balance of topics taught and of the introduction of new influences such as perception studies, WHITEHAND's survey also lends some substantive evidence to the concern expressed earlier in this paper that centrifugal tensions were affecting the specialism. One might deduce that many of the advanced urban courses were taught by fairly established staff. If so, it was perhaps not entirely surprising that WHITEHAND observed,

"Departments with a radical course in which urban geography is a sub-theme either do not have an advanced course entitled 'urban geography' or if they do it is not particularly radical. A possible interpretation of this is that the most extreme radicalism has taken the form of setting up completely new courses that cut across the 'traditional' sub-division of urban geography" (p. 198).

Terms such as radical and conservative or mainstream and sub-sectional may infer an oversimplistic dichotomy but they sharpen attention on to particular aspects in a discussion of the roles of continuity and change in the evolution of the subject. Providers of advanced courses on urban geography had to review regularly the rapidly expanding literature on urban topics, decide which new themes and approaches should be adopted and introduced and thereafter to rearrange the content of the course in terms of order, relationships, weighting and even ethos. Where urban topics featured in other courses the preservation of a coherent specialism known as urban geography was understandably not a matter of attention

or concern. Fortunately for supporters of urban geography as a major specialism, a succession of textbooks have offered valuable redefinitions of the mainstream of the subject which have largely succeeded in incorporating new topical, philosophical and technical developments, although the diversity of interests continued to grow.

In the early 1970s human geography in Britain was the subject of a number of state of the art appraisals such as the Social Science Research Council sponsored 'STUDIES IN HUMAN GEOGRAPHY' (1973), a sequel to the SSRC review of current research published in 1971. In the latter CHISHOLM outlined a number of priority research areas in human geography which included perception studies, simulation models, forecasting models, regional taxonomy, environmental standards, the spatial dimensions of population growth and change and the processes of social and economic change. The SSRC state-of-the-art survey covered seven areas: economic development; population migration; the location of service activities; structure and scale in the city system; the urban scene; regional development; geographers, decision takers and policy makers. Taken together the two volumes provided a view of the current position and the possible direction of future development. Urban topics featured prominently in the analysis of the current position. By comparison, the direction of future developments was largely either technique-oriented or in favour of topics which specifically transgressed on urban-rural divide in order to introduce new fields of investigation. Both components in the research priorities produced work of interest to urban geographers but neither was designed to specifically promote the specialism.

Additionally, human geography in Britain was asked disturbing questions about purpose in what became known as the 'relevance debate', which featured prominently in the IBG journal AREA in the early 1970s. JOHNSTON (1979) presented a detailed analysis of the context and nature of this debate in Anglo-American human geography. A number of issues which were being debated in Western societies in the late 1960s reached into

academic geography with the rise of liberalism and radicalism and through renewed discussion of the relationship between geography and policy-making. The subject of policy-making revived an established interest in applied themes which had been maintained with distinction by researchers such as P.HALL, but had become a comparatively minor facet of urban geography during the period of supremacy of the functionalists and spatial analysts. Renewed interest in policy offered a rare opportunity of convergence of interest between young politically committed researchers (eg. BLOWERS) and senior figures in the profession of the stature of CLAYTON, COPPOCK and HOUSE. COPPOCK (1974) in his presidential address to the IBC argued in favour of the involvement of geography in public policy, but papers by HARE, HALL, LEACH and HARVEY were less enthusiastic about the prospect. HARE (1974) concluded that geographers as individuals may have something to offer public policy, but the discipline was irrelevant to the separate field of public policy-making. HALL (1974) considered that geography lacked the normative base required by policy-makers whilst HARVEY (1974) presented a radical interpretation which depicted the discipline as being corrupted by the growing corporate state into supporting the status quo through the illusion that it had a role to play in decision-making.

JOHNSTON (1979) attributed the opening exchange in the relevance debate in Britain to remarks by CHISHOLM (1971) who had distinguished between the interests of academics for freedom to research any topic which they wished and of government which sought cost-effective research related to real problems. As an aside one must observe that this clash of interest continues to tax the academic world with even greater rigour, but we will return to that point later in the paper. The ensuing relevance debate ranged across philosophical and political matters, but one recurrent theme to emerge was the voicing of a substantial area of concern surrounding the failure of geography to tackle a number of contemporary major social issues. Radical geographers sought a major philosophical shift but many geographers were simply

tired of the apparently endless minor technical notes in journals super-refining statistical techniques as if these were the ultimate goal of the subject.

Urban geography had no privileged position in the debate but urban problems were certainly plentiful. Many graduates of that period were attracted to the burgeoning discipline of planning and many academic urban geographers contributed to planning surveys. In my forthcoming volume on 'THE PRACTICE OF GEOGRAPHY IN SCOTLAND' U. WANNOP, professor of planning, argues that the quantitative revolution was one of the principal offerings of geography to planning, the other being a re-alignment between the two disciplines from the mid-1970s as planning became involved in economic policy and local initiatives for economic recovery. The former illustrates the 1960s phase and the latter one element of the post-relevance era. WANNOP is sceptical of the survey tradition of geography which he believes often leads to the unfocussed gathering and dutiful presentation of static data.

Subsequent to the relevance debate the major change affecting urban, and human, geography has been that of a greater diversity of philosophical stances or approaches including positivist, behavioural/perceptual (GOLD, 1979), welfare/liberal (SMITH, 1977; KNOX, 1982), radical/structuralist (HARVEY, 1973, 1985a, 1985b), and humanist (LEY, 1983).

Ideology has become more explicit in the structuring and purpose of geographical research. This phenomenon confronts all social sciences but it is one which seems to cause geographers considerable discomfort, arising partly from a sense of loss of unity.

Different ideological stances tend to result in conflicting interpretations, but it is debatable if that equates with unmanageable chaos. Concluding a discussion of conflict and accommodation between the various ideologies JOHNSTON (1986 p. 156) stated:

'Hence choice remains. It is not simply a choice between quantitative and qualitative research, for that can be made within each of the approaches... it is a choice between determinism (whether structural or empirical),

voluntarism or contextualism. And most importantly of all, it is an ideological, and hence a political choice. In choosing to approach human geography in a particular way one is choosing - however implicitly - to promote a certain ideology of society.'

Since individuals or groups may seek to promote various ideologies of society any mature specialism in social science must expect to be confronted by these differing views. It also follows that the prevailing paradigm in a discipline is not merely a matter of the resolution of rational academic debate, for the latter in turn must be set within the context of the ideological arguments about the structure of society, both in general and in particular countries.

Diversity of topical interest has also continued. The list of contents of Volumes III and VI of the six volume series 'GEOGRAPHY AND THE URBAN ENVIRONMENT'(HERBERT and JOHNSTON,1980,1984) provide a sample of the vast field of urban geographical research. In Volume III the ten chapters dealt with: spatial autocorrelation problems; the modelling of shop-choice patterns; urban retail provision and consumer behaviour; trader mobility in systems of periodic and daily markets; the characteristics of retired migrants; the elderly in an urban environment; locational-environmental perspectives on old-age segregated residential areas; local authority provision for the elderly; conflict over the location of mental health facilities; neighbourhood effects on mental health. Volume VI, the final one in the series, contained chapters on: a review of analytic behavioural research in geography; discrete choice modelling in urban analysis; environmental cognition and travel behaviour; the subsidy of urban public transport; community power and local state; suburban economic integration - external initiatives and community responses; judicial intervention, busing and local residential change; gentrification and residential location theory; demystifying suburban landscapes; local areas in the city. Thus, apart from differences in ideological stance, there was also variation between researchers on other dimensions such as the level of interest in technique or in social or policy issues.

One indication of the principal themes in urban geography in the 1980s is provided by the ten topics featured in the contributions to 'PROGRESS IN URBAN GEOGRAPHY' (PACIONE, 1983): housing; employment and unemployment; crime and delinquency; ethnicity; urban government and finance; retailing; transport; health; territorial justice and service allocation; pollution. The editorial view of the relationship between content and trend was illustrated in the placing of urban morphology into the volume on 'HISTORICAL GEOGRAPHY: PROGRESS AND PROSPECT' (PACIONE, 1987). In fact, as WHITEHAND shows in the chapter on urban morphology considerable progress has been made in the analysis of agents of morphological change and the management of the historic urban landscape has become an important topic of policy research by urban morphologists.

Shifts have occurred within other sub-specialisms. In the study of urban crime spatial, ecological and environmental approaches have been followed successively (HERBERT and HYDE, 1985). In housing studies, the emphasis has swung towards the managerialist approach with analyses of specific agents in the allocative process and investigations of the needs and lot of particular sub-groups of the population.

Within the last five years the major research funding body for social science in Britain, the Economic and Social Research Council, has sponsored important research programmes on the Inner Cities and on the Changing Urban and Regional System in the UK. Both are major comparative studies. The Inner Cities Programme has been completed. Five empirical studies investigated economic change in the Bristol region, policies for economic regeneration of the Clydeside conurbation, the employment problem in contrasting areas of London, the economic problems confronting the West Midlands and economic development policies in the Newcastle metropolitan region. Additionally, 'cross-cutting' studies were made about the directions for urban policy, critical issues in urban economic development and the new economic roles of UK cities. The comparative study of the changing urban and regional system commenced in 1985 and, to date, only initial reports have been presented to

conferences. The emphasis in this project is firmly upon locality with the intention of complementing the overwhelmingly economic focus of the Inner Cities Programme. It remains to be seen whether complementary or discontinuity is the outcome.

To date urban textbooks have accommodated changes in content and approach with a fair degree of success. In some cases the list of topics was apparently conservative, but the detailed content displayed a measure of evolution and change. For example, an introductory volume by CLARK (1982) covered the well-established themes of the field of the subject, definitions, urban growth, urbanisation, urban location and the urban system and the internal structure of the city, with a final chapter on urban planning and urban policy providing an opportunity for the introduction of a number of applied topics. The contents of the chapter on the internal structure of the city included sections on ecological and economic approaches, social area analysis, factorial ecologies, conflict management approaches and marxist analyses; an impressive survey of different viewpoints on the subject. HERBERT and THOMAS (1982) in a larger textbook elected to devote an early chapter to paradigms and theories in urban geography in order to establish the conceptual bases prior to the discussion of particular themes. Thereafter, the treatment ranged through urban systems, spatial infrastructure, the social geography of the city and the city as a social world, before concluding with chapters on urban problems and urban trends and urban policies.

Content and treatment must be affected by the explicit, or implicit, value system of the writer. For example, few, if any, structuralist urban texts would omit a section on property investment. Similarly, welfare/liberal/humanist writers tend to emphasize social themes. Nonetheless, with the exception of most structuralist volumes, there remains a considerable degree of congruence, and a substantial measure of continuity, in the major topical coverage in urban texts.

PROSPECTS

There is a substance in the view that powerful external forces are affecting British higher education, in aggregate and at a more localised scale. For example, the University Grants Committee research ratings of subjects by departments (1986) sent a chilling wind through the system. Some departments are in a state of siege and are unlikely to survive. Others have sought re-orientation, including marriage with cognate disciplines as a proactive selectivity response. A few years ago an attack on a discipline would have met with the cry 'why us?' There has been outcry but the principal battle-ground has been the Senate of individual universities as subjects sought survival from the axe of rationalisation.

The other major sources of comment have focussed upon the indicators used in the rating exercise and the lack of reliability of the exercise (SMITH, 1986; BENTHAM, 1987; GLEAVE, HARRISON and MOSS, 1987) and on the threat to the nature of university education and to particular disciplines (CARTER, 1986).

Rationalisation has also affected the public sector (polytechnics and colleges) through the policy pronouncements of the National Advisory Council (NAC), the sectoral equivalent of the UGC.

Yet Geography received direct forewarning of the winds of change. In the presidential address to the Institute of British Geographers in January 1985 K. CLAYTON, then vice-chairman of UGC, urged departments to pay more attention to research, to build larger research teams, to do less in order to improve quality and to seek increased cooperation with cognate subjects.

Additional pressures upon the system arise from the governmental desire for an increased emphasis upon vocational training, from changes in the employment market for graduates, from changes in the priorities of research funding bodies and from the forthcoming decline in the number of pupils in secondary schools consequent upon the 1970s fall in the birth rate in Britain.

In varying degrees geography departments have responded to the first two of these threats by paying greater attention to skills and courses with vocational applications, e.g. computing and planning respectively. Neither trend within the discipline was driven primarily by external pressures, but recent events have encouraged a more vigorous extolling of these features of a geographical training, particularly the promotional activities of the Geographical Association, the Institute of British Geographers and the Royal Geographical Society. To date, response to the policies of research councils has been diffuse, partly because there has been a measure of inter-council and temporal variation in policy. Additionally, distinguished lone scholars have continued to dispute notions of centres of excellence and point to dangers in concentrating research resources in that manner.

Earlier fears of a substantial decline in student numbers by the mid-1990s have eased recently with Government statements supporting increased access for various groups such as mature applicants. University initiatives, including the extension of the University of the Third Age concept to other British institutions apart from the Open University, are also probable developments. Nonetheless, significant alteration of the demographic composition of the student population could present problems for Geography unless adjustments are made to the curriculum. Certainly most of the conceptual geography courses offered by the Open University have attracted smallish enrolments.

These pressures pose urgent questions for the discipline about purpose, scope and organisation. Reviewing progress and assessing future directions is a long-standing geographical trait and there have been several recent personal statements (GOULD, 1985; JOHNSTON, 1986; STODDART, 1986). Normally the author seeks to persuade geographers (and sometimes non-geographers) that Geography really is a worthwhile subject of study. Students often find this articulation of academic self-analysis boring. Carried to excess it becomes the philosophical equivalent of the 1960s over-concentration upon

technique to the neglect of content and explanation. In her review of 'ON HUMAN GEOGRAPHY' the searching pen of KENNEDY (1987) notes that JOHNSTON 'seems unclear whether he is setting out on a New Crusade or advocating withdrawal to a hair-shirt existence of inner contemplation' (pp. 245-246). Given the recent trends in human geography such uncertainty, if it exists, is understandable but it is undesirable at a period when the profession needs vision, confidence, presence and a clarity of purpose.

Where does Geography stand in relation to these needs? One of the founder members of the IBG, A.GARNETT asks (1987):

" And can we now usefully ask of ourselves and of our somewhat fragmented discipline 'Whither the geography of today and tomorrow?' for surely on the answer to this question will depend decision-making regarding the educational value and popularity of our subject in schools and its role as a university discipline and in other institutions of higher education. As geographers today probe and strive to expand our frontiers further, would our answers now be too disparate to command attention?"

What does the future hold for urban geography? As a part of his comment on the state of the discipline, CLAYTON (1985) surveyed the papers offered at honours level in British university geography departments. By a narrow margin urban geography was the most popular title. As mentioned earlier in this paper, the Urban Geography Study Group is the largest within IBG. Urban themes feature prominently in most major geographical journals. Recent IBG Special Publications have included research volumes on: the urban landscape (WHITEHAND); the future for the city centre (DAVIES and CHAMPION); redundant space in cities and regions (ANDERSON, DUNCAN and HUDSON); residential segregation, the state and constitutional conflict in American urban areas (JOHNSTON) and the changing face of cities (WHITEHAND). Urban geography therefore scores strongly on the important modern indicator, research output.

It also performs well on the vital external dimension, perceived relevance. Urban policy is a recognised field, adopted both by central and local government and by a wide range of agencies. Urban geographers have identified with

this field as ROBSON's (1987) volume on 'MANAGING THE CITY' illustrates. Debate may occur as to whether problems are of the city? or in the city?, but the use of the city as a spatial unit for policy is convenient, administratively and politically.

Collectively these factors suggest a secure future for urban geography, or at least for the geographical study of urban topics. Researchers in, and teachers of, the specialism will continue to be confronted by the issues raised by CARTER (1983, p.xiii) about urban studies in social sciences:

'Are these specialisms discrete and distinctive in that the urban context creates unique conditions demanding intrinsic interpretations, that is the generation of urban theory, or are they simply indicative of an area of interest, a source from which exemplification is drawn, and little more?'

However, the fact is that the majority of people in the developed world live in urban settlements and soon the same situation will prevail in most developing countries. An almost inescapable outcome is that problems which are believed to be associated with, or concentrated in, urban areas will continue to attract the attention of policy-makers. It would be astonishing if urban geographers did not respond positively to future research opportunities. Equally, it would be remarkable if we did not teach the subject, in some guise, in undergraduate courses. External forces may lead to a reduction in the number of geographers and geography departments in British higher education, but there is no reason to expect urban geography to suffer disproportionately.

If these deductions are broadly correct, then one potential threat remains, namely damaging fragmentation arising from the diversity of topical interests. There are several facets of this threat. One which has existed, and happened, for some time is that particular sub-specialists move laterally into adjoining disciplines as has occurred in relation to retailing, urban and regional studies and social policy. The growth of business studies in British universities is likely to intensify

these pressures as urban geographers seek the challenge of expanding fields of study and new frontiers of topical instruction. Such academic migration may benefit the mother subject by placing disciples in other camps. But excessive haemorrhaging, especially of active or innovative researchers, would be damaging. The analogy with population migration may be imperfect but the messages to be learned from it are salutary.

Another dimension could emerge if geography followed CLAYTON's (1985) suggestion and defined a core. Would the selection be pragmatic and recognise market forces? Or would the views of academic integrity prevail with a search for what were perceived to be the major sub-divisions of the subject? If the latter course was adopted it could be argued that urban geographical studies could be reclassified within a quadripartite macrodivisional structure of human geography (economic, social, political, historical). One is tempted to dismiss this threat as unrealistic since universal agreement would be highly improbable. However, there is some historical evidence to show that a redefinition of the nature of investigation (adoption of the positivist paradigm) leads to a partial relative and absolute eclipse of the principal specialisms of the previous paradigm (regional geography). By analogy, are geomorphology and urban geography endangered by the next paradigm shift? That scenario is excessively pessimistic if for no better reason than the fact that geography would display an extraordinary introversion were it to disregard the signals from external market forces which indicate a continuing interest in urban topics.

Finally, a brief consideration of two inter-related questions. Would the adoption of a unifying or over-arching focus assist urban geography to combat diffuseness and fragmentation and develop a more cohesive philosophy? And if so, would the espousal of an environmental emphasis be a route to that goal? A positive response to the first question seems to be unavoidable, although most researchers into particular urban topics are probably not unduly inconvenienced by its absence.

Nonetheless, a specialism requires an identity, a clarity of purpose and content. For some time concern with spatial analysis has offered a reasonably viable over-arching structure. More recent diversification of ideological standpoint has resulted in criticism of that unifying framework. One solution to the present dilemma might be an emphasis on policy-related issues. There is mounting evidence that a number of urban geographers are adopting or considering that strategy. It is not a new occurrence and one can only draw on previous experience which indicates that the general response of the discipline has been critical of suggestions that geography should solely be concerned with policy issues. The climate of opinion may be changing. At least an emphasis upon policy issues would enable the co-existence of differing philosophical stances, thereby preserving the broad church which Geography has tended to favour.

An alternative unifying focus might be an emphasis upon environment. The word environment conveys an explicit contextual interest which is consonant with many recent philosophical shifts within geography, urban geography and other social sciences. Thus, it offers a useful link with an ecological tradition in the discipline and provides a means of bridging the physical-human divide in geography whilst maintaining important conceptual links with other social sciences. Environment would serve the function of a useful umbrella covering the diverse topics studied by urban geography but success in the role of an over-arching theme is debatable.

A distinctively environmental approach would probably require the abandonment of certain current perspectives and topics. That in itself would not be an insurmountable obstacle if a powerful coterie of protagonists for such an approach existed although at present none exists. An assemblage of current themes under an environmental umbrella would be feasible but not necessarily satisfying or illuminating. It would almost certainly attract the comment that adoption of systems analysis would be a more coherent and penetrating solution. Yet the search for a framework is important as ROBSON (1984, p.105) recalls from his student days:

'What was missing, overall, was any overt attempt to spell out a purpose, to construct an over-arching framework, into which the parts might be slotted.'

What other alternatives are available? Structuralists believe their approach provides a complete framework but, as long as different ideological or philosophical stances to geographical research co-exist and compete, structuralism cannot constitute the over-arching theme. Indeed, WILSON (1984) argued that

'Urban analysis should be prepared to take on the radical critique on its own terms. There are a number of reasons for this. First, because it is important that major critiques be responded to; second, many radical practitioners are not going to operate in the language of modelling, and it is probably easier for modellers to attempt the reverse process; third, syntheses are nearly always fruitful.'

In this defence of mathematical modelling WILSON also suggested that quantitative spatial analysis continued to offer a useful framework for urban investigation. JOHNSTON (1980) in 'CITY AND SOCIETY' (p.26) advocated a more accommodating response to structuralist critique with a theory which was

'essentially a backward-looking one, seeking to explain the present through the past and treating the current urban phenomenon as the outcome of an evolutionary process'.

The choice of an over-arching framework may not be the most pressing item on the current agenda for urban geography, but in the longer term it is an essential goal and the outcome of the selection could have a profound effect upon the specialism. Urban geography is not an endangered species but it may be going through the throes of a mid-career crisis. Indeed, if it is accepted that there are analogies between the discipline of Geography and the specialism of Urban Geography, the search for an over-arching theme is of wider significance (see GRAHAM in this volume). Can we discover the theoretical core of the subject or is Geography inevitably distinguished by an eclectic use of theories and concepts

to achieve spatial analysis, explanation and synthesis? Is Geography on the brink of a phase of academic maturity which could accommodate various approaches and emphases because the distinctiveness of the discipline is recognised and accepted both by geographers and non-geographers? If so, is the route to that goal to be found in theory and methodology or in a modern statement of seemingly traditional tenets about environmental relationships, spatial interactions and spatial synthesis as an over-arching framework for Geography and its sub-specialisms?

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SOME RELATIONS BETWEEN PRODUCTION AND URBAN DEVELOPMENT IN HUNGARY

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INTRODUCTION

In Hungary, within the framework of a country-wide research programme, different research institutes have been dealing with the problems of territorial and urban development for some years. As part of this programme, the Department of Economic Geography and Regional Economics of the Karl Marx University of Economics, in cooperation with several other research establishments, has been undertaking a programme of research on the relationships between production and urban development.

It goes without saying that the scope of this research has not been able to cover the whole field of the complicated relationship between production and urban development. The research has, therefore, been selective and the emphasis has been upon an examination of how changes in the structure of production, which are of vital importance to the prospects of the Hungarian economy as a whole, influence conditions in the urban centres of the country. The researchers wanted to find out what sorts of new demands would be placed on urban centres, and what positive and negative effects from the point of view of their development have been caused by the modernization of the production structure (BOKOR, BORA and KULCSÁR, 1985).

This study presents a brief summary of the most important findings of this research which is still in process. First of all, it has to be pointed out that, although the developmental level of urban centres and the existence of a modern production structure are closely correlated, this relationship is, nevertheless, an indirect one. As a consequence of the different structures of taxation and income redistribution, the direct effects are of more limited scope in Hungary than in countries having more decentralized territorial control systems. Indirect relationships, however, are quite far-reaching even in Hungary.

RELATIONSHIP BETWEEN CHANGES IN PRODUCTION STRUCTURE AND URBAN DEVELOPMENT

A very important question from the point of view of the influence exerted on urban centres is whether the setting up of an industrial unit produces change in the macro-structure of the particular settlement or whether it is the modernization of the product structure of a company that leads to alterations in the production structure.

The problem of structural adaptation is not so much a question of *macro-structure*; rather, in future, it is changes in *product structure* that will become more necessary in Hungary. Nevertheless, when an economic policy designed to promote the development of infrastructural branches is approved, certain macro-structured redistributions can also be expected as a result of the relative growth of the tertiary sector.

Quantitative and qualitative changes in infrastructure have a strong and direct influence on urban development. Since infrastructure is mainly concentrated in urban centres, one of the most decisive factors in urban development is the reduction of infrastructural underdevelopment because this will have a direct effect on employment structure, on the supply of consumer goods and on the general appearance of a settlement.

In addition to the above changes that affect most towns and communities, the discovery and exploitation of *new sources of raw materials* or the setting up of *new plants in urban*

centres may also fundamentally *modify the macro-structure* of production, thereby generating a series of cumulative effects in the development of such settlements and surrounding areas. For example, the changing role of coal in energy consumption may exert a powerful influence on the economic environment of certain urban centres, by affecting the location of electricity generating stations (though evidently the number of centres so affected will be limited).

As for the future of certain communities, favourable natural endowments may also stimulate their development. Thus, development of *tourism* (in particular rural tourism), may lead to *macro-structural changes* in the economy of certain *small towns and villages*; indeed, the role of tourism in the retention of rural population may already be demonstrated in a number of instances. However, due to a lack of hotel accommodation and other facilities, the positive effects of tourism only exert a limited influence on smaller communities with less than 1,500 inhabitants at present.

As regards settlements with good possibilities for international tourism, the use of central funds to improve hotel accommodation and other facilities may serve as the basis for further development using local finance and initiatives (KARBUCZKY, BENKE-GERGELY and MÁTÉ, 1985).

Notwithstanding the previous examples, it is unlikely that macro-structural changes will dominate the process of structural transformation in future, and it is for this reason that the research has laid great stress on investigating possible changes in the micro sphere. However, *product structure* by itself *does not generally exert an influence on urban development*. Rather any effect that it has is *through the technical-economic processes*, that form its basis.

To the extent that the processes considered necessary for the development of a country in the late 20th century, viz. microelectronics, biotechnology, robot technology, automatic production control systems and up-to-date organizational processes, have gained some ground in Hungary, they will surely exercise an influence on the life and development of towns and villages. The spread of these processes and

the emergence of more advanced product structures in general are not primarily determined by the possibilities of urban development, but rather by general social and economic conditions. The factors limiting the spread of modern technologies and control systems, on the other hand, are connected with urban development, and it is *infrastructure* which presents the most *direct connection between the transformation of production structure and urban development*. Today there are very few people who would question the view that infrastructure significantly influences the development of an economy, in the long run, and that certain infrastructural elements can directly speed up or hinder development. Earlier declines in the effectiveness of certain branches may also be linked to infrastructural deficiencies of a quantitative, qualitative and structural nature. In other words, the *infrastructure* of an urban centre in the broadest sense (technical, institutional and intellectual) may *hinder or promote* the rapid spread of up-to-date procedures.

Flow of information

One such condition may be the establishment of an information base which, among other things, may help in the prediction of world economic processes, and the adoption of methods used for analyzing marketing possibilities. Other information bases may be used for classifying activities into those that should be developed, those that should be maintained at the same level and those that should undergo contraction.

A chronic failing of economic and social life in Hungary is the low quality of the information system. Information takes on an extremely important role in our age when markets are characterized by keen competition among different products, and production is characterized by steady changes in structure. Moreover, the desire to bring about more effective cooperation among various economic institutions together with the promotion of innovation, the revaluation of the role of market information and the spread of modern

techniques, all require the establishment of reliable *information systems*. Unless our information culture is greatly improved, Hungary has no real chance of even maintaining its present position in world markets. If an information system were to be set up for the entire country, the existing relationships between the forces of centralization and decentralization would be significantly modified. This, in turn, would improve the development prospects of the smaller urban centres and would strengthen interurban cooperative links rather than the present hierarchical system.

As regards information systems, all urban communities have immediate requirements for effective *telephone* networks (and cabled communications in general). From this point of view, Hungary lies in a very poor position, and it is a vital national interest that the extent to which she lags behind other countries is reduced. Moreover, there are great territorial disparities both between and within counties because the development of the information network during the past fifteen years has been concentrated primarily on the county seats, larger towns, and the more economically developed territories (JAMERIK and KELEMEN, 1984).

The efficient running of companies and their flexible adjustment to changing circumstances is hindered by the fact that the quality of the telephone service varies greatly from urban centre to urban centre. The least that one can expect from a telephone network is the promotion of production control and hence flexible changes in product and production structures. Moreover, every settlement in the country should be equally accessible at any particular time.

In addition to being an integral part of urban infrastructure, the telecommunications systems also indirectly affect urban development through the services they offer. The international literature shows how the improvement of the telecoms system is of *immense social and economic benefit* and that investment in this area is *in the interests of the population, the settlements and production alike*.

Innovation

As well as the expansion of the information culture, *innovative activity* also requires a wide research-and-development base. This, however, does not mean that it has to be institutionally present in every settlement, although innovations can be widely spread regionally. Thus, provincial centres of intellectual life may play a significant role in the process of technical renewal and in the spread, adaptation and development of existing technologies by organizing the R & D activity of local universities and research establishments.

A good form of cooperation may be a team of research workers organized with a definite task, or an R & D association. Our survey has shown that many Hungarian towns possess significant intellectual capabilities, and it is clear that it is not a lack of people with the right qualities that hinders the spread of innovative activities. However, the present economic environment and the *low prestige* in which intellectual work is held do not favour the realisation of this existing *intellectual potential*. But equally, other factors have also contributed to the unsatisfactory level of innovative activity, especially the lack of any really close connections between research and production and the constrained market which discourages companies from innovating (NAGY, 1983).

Manufacturing and the urban environment

Changes in production structure considerably influence the internal structure, territorial relationships, building methods and the outward appearance of urban centres. In this respect, the location of manufacturing units and changes in communal housing and infrastructure are the principal trends that should be considered by town-planners. The increasing part played by *qualitative factors in the economy* also raises the demands placed on the urban environment and indirectly creates conditions for the reproduction of labour. Alongside education and public culture, a civilised way of

life is also a very important condition for high-quality work and for the necessary responsiveness to advanced technologies. That is housing, transport and shopping conditions, a high standard of living and a satisfactory working environment are all very important factors in the further development of the economy and its shift towards a new pattern of growth.

With advanced production technologies coming to the fore, the *protection of the environment* will also undergo change. Neither today nor in the future will be able to describe a technology as modern and up-to-date if it pollutes the environment.

One very sensitive problem central to structural transformation is the reduction of loss-making activities. Today there is a professional consensus that the successful adjustment and modernization of the structure of production is impossible without the simultaneous reduction of loss-making activities. As long as enterprises refuse to treat the danger of liquidation seriously, they are not forced to remain competitive and modernise their activities. Regarding liquidation, difficulties arise from the lack of any definitive methodology for determining enterprise efficiency.

The role of the market is still significantly distorted by our system of prices, taxation and subsidies, which, in turn, makes enterprises insensitive to costs. Since enterprises cover their costs not only from their own revenues but also from central funds, they may have an interest in activities which they are unable to finance from their own resources. Moreover, the discovery and elimination of the causes of loss may prompt improvements in efficiency and also lead to the acceleration of technical development. However, despite this positive side, the reduction of loss-making activities also generally has *unfavourable consequences* on the local area, even if only temporarily and there is a need for close cooperation between the central and local administration to solve tensions that may result. It is very important fully to understand the consequences of any closure

on those settlements where the employment structure is such that it is difficult to redeploy the work force (ZOLTÁN, 1984).

Nevertheless, the fact that in some of our towns nearly all the enterprises are in crisis warns us to handle this matter with great care. These towns tend to lack any of the dynamic branches and rely on heavy industry; nor do they have other non-industrial sectors which could temporarily act as a cushion in any restructuring exercise.

Problem industries - problem areas

Problems arise especially in the interrelated sectors of coal mining and electricity generation, and from the world recession in metallurgy and heavy chemicals. Investigations by the Department of Industrial Economics at the Karl Marx University of Economics reveal that *mining* spares neither the natural nor the social environment (PAPP, 1985). When, however, mining is only one of the local industries, towns stand a better chance of undergoing the positive processes of urbanization. Undue dependence on *metallurgy* gives rise to similar undesirable characteristics. Metallurgy is highly sensitive to the business cycle, and must be export-orientated to obtain the necessary economies of scale. Consequently, it may be risky to encourage concentrations of population merely on this branch of industry. The problem is further compounded by the fact that the development of the metallurgy industry requires substantial investments in energy.

An analogous, although more tractable situation, can be observed in those towns based on *heavy chemicals*. Their somewhat more favourable position is due primarily to the fact that they require a more highly skilled labour force and as a consequence the educational standard of their workers is higher. It is this that promises a more hopeful future for such places. The economic problems of areas struggling with structural crises are unlikely to be solved within the context of the traditionally established sectors.

There can be no doubt that the necessary structural transformation initially depresses the economic prospects of both the companies and settlements concerned, and that the migration of labour will be generated from this process for some time to come. This in turn requires a considerable increase in the stock of housing in those centres attracting migrants.

It follows on from this that structural transformation is not only a problem for the national economy and its various sectors but also for regions and urban centres because the social consequences of the contraction of certain activities are geographically discrete. The transformation of the one-sided production structures of certain urban centres and the introduction of more dynamic activities cannot therefore be achieved by local initiatives alone, especially in those areas where industry is in a state of crisis, but must be sought through the collaborative efforts of both the local and central organs of the state. It is only in this way that the necessary material, infrastructural and organizational changes can be brought about.

CONCLUSIONS

Without aiming to be comprehensive, this paper has tried to stress that structural change has several implications for urban centres besides those that operate through profitability. Of course, a comprehensive programme of research has to be concluded in order to expose these effects in depth. Nevertheless, the existing research findings have clearly shown that urban centres vary greatly as regards their potential for the modernization of their production structures and, as a result, further territorial differentiation and polarization in the level of development may well take place. A re-evaluation of the former conception of equalizing territorial development is therefore urgently required, and we must aim to move to a position in which our research findings are incorporated into urban development policy. In addition to promoting the increased territorial effectiveness of the various sectors, it will also be necessary to persuade the population to accept the continuation of certain disparities in urban

development. Needless to say, it remains the duty of urban policy to moderate these differences, primarily through the system of regulation operated by local councils.

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THE ROLE OF SMALL TOWNS IN THE
DEVELOPMENT OF AN UNDER-DEVELOPED
REGION - THE CASE OF
SZABOLCS-SZATMÁR COUNTY

B. HAJNAL

THE CHARACTER OF ECONOMICALLY UNDER-DEVELOPED REGIONS

Notwithstanding the important advances of the last few decades, there are regions within Hungary, but most specifically within the county of Szabolcs-Szatmár, where social and economic development is significantly behind that of other parts of the country. Although considerable development has occurred in Szabolcs-Szatmár since 1970 as a result of central assistance and local initiatives, the reduction of geographical disparities within the county has nonetheless been disappointing. Moreover, the overall position of the county vis a vis other parts of Hungary has tended to worsen. The present situation exemplifies the disadvantages of unequal development. Declining financial support for development, both from central and local sources, has strained relations, the influence of which has been felt particularly severely in the economically under-developed regions of the county.

In 1985, Parliament, in its deliberations about long-term regional development and the trends in the settlement-network, expressed the desirability of narrowing disparities and a significant contribution was expected from the state

for the achievement of this objective. Part of the preparation of the VIIth Five Year Plan was the identification of those regions for which there is to be a programme of development to be realised within 10-15 years. In the selection of these regions, the following criteria were used: the absence of employment opportunities; high rates of commuting and out-migration; an unfavourable age structure biased towards the elderly; unfavourable agricultural endowments; low per capita income; a lack of specialist manpower; a settlement structure comprised of small villages and hamlets; separation from natural hinterlands because of a location close to the national border; poor infrastructural development. Using these criteria, 574 settlements, containing 431,000 inhabitants or 4% of the total population of the country, were picked out, of which 125 lay within Szabolcs-Szatmár. Collectively, these latter have a total population of around 150,000, that is nearly a quarter of the population of the county, and fall into three regions - Northern-Szabolcs, Szatmár-Bereg, and South-east Nyírség (*Fig. 1*). Only 8 of these 125 settlements recorded an increase in population over the last one and a half decades when more than 26,000 people were lost through out-migration. Their populations are also ageing, because of low birth rates and the out-migration of young adults accentuated by a net inflow of pensioners.

The employment structure of each of these regions is also unfavourable, being dominated by agriculture, which occupies a disproportionately large segment of the labour force. Employment is an especially critical factor in and around the towns of Fehérgyarmat, Mátészalka, Vásárosnamény and Csenger where, when measured on almost every index, the situation is shown to be worse than the county average. Up to two fifths of the potential labour force are not in active employment and, although these are mainly unskilled women, a substantial number of young people also fall into this category, many with secondary qualifications who are therefore capable of performing responsible jobs of a technical nature.

One of the main characteristics, and also causes, of this economic weakness is the lack of industrial workplaces which,

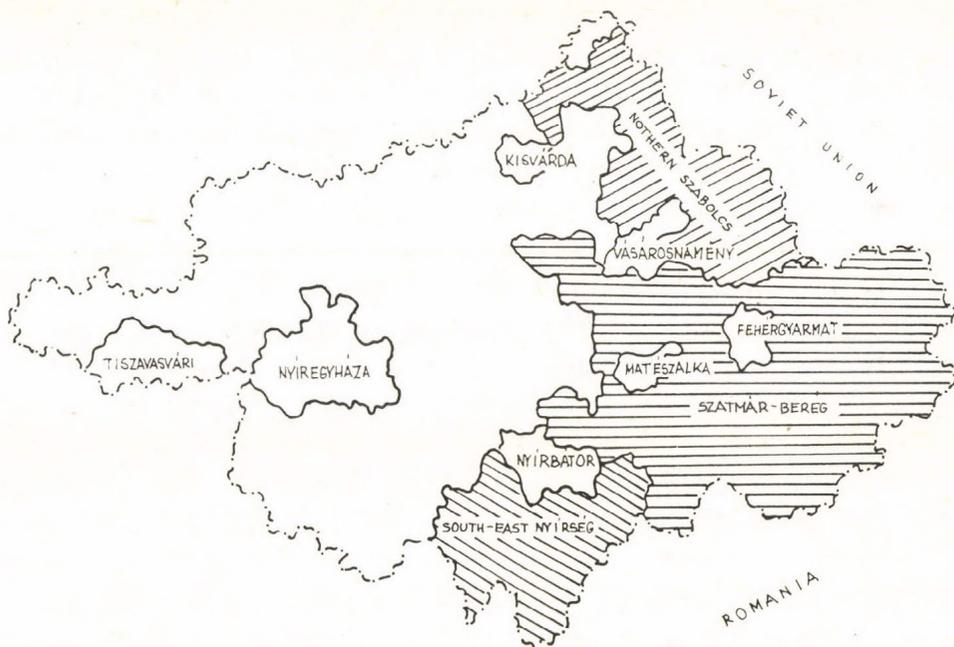


Fig. 1 Economically under-developed regions in the county of Szabolcs-Szatmár

in turn, is closely connected with late industrialization and the poor resource endowment. In addition, those parts of the county adjacent to the Soviet and Romanian borders have not been industrialised. Thus, there is only one industrial plant in the Tiszahát and similarly in South-east Nyírség, and none at all in the Erdőhát. Moreover, most functioning units are the branch plants of enterprises controlled from outside the county. This disadvantage is intensified by a poor infrastructure. For instance, these regions are only tied into the telephone network at one point, Nyírbátor, while transport conditions are almost equally bad, with no rail connection to the Tiszahát or Erdőhát. Moreover, only Vásárosnamény and Mátészalka are linked to the gas network while electricity provision is not entirely satisfactory either.

In addition, the local agricultural co-operatives have to contend with land which, in general, is 40% below the average quality for the country as a whole. As a result 24 of the 60 farms are in permanent financial deficit with no possibility of providing reasonable increases in the personal incomes of their members. In addition, flooding causes significant and regular damage. They also carry substantial social burdens, especially large numbers of retired members whose support is the responsibility of each farm. Skilled labour is in short supply. Moreover, although the quality of farm management is generally adequate, there are insufficient economists, accountants and technical experts, like veterinary surgeons. The possibilities for the expansion of supplementary activities are also restricted, not only by a lack of capital and infrastructure, but also by limited technical expertise.

A weak administrative structure compounds these disadvantages. For instance, 63% of the villages have no local council building, while the railway system only serves a quarter of the settlements and many are also without a bus service. Moreover, filling stations are to be found at only 10 locations, 51 of the 125 settlements have no primary school, 65 lack medical facilities, only 8 have their own dental surgery, 111 lack a pharmacy, and only two thirds have a piped water supply. In other words, the level of supply to the population is critically low especially in the hamlets and surrounding areas (*Fig. 2*).

The aim of development is to strengthen the regional economic base and through this improve the productive capacity of individual enterprises, increase employment opportunities, reduce out-migration and enhance the quality of life of the population. An analysis of the problems suggests that any programme of development should have three objectives, namely: solving the employment problem by investing in the creation of new workplaces; increasing the productive capacity of agriculture to provide a greater level of economic stability; developing the infrastructure and social factors of pro-

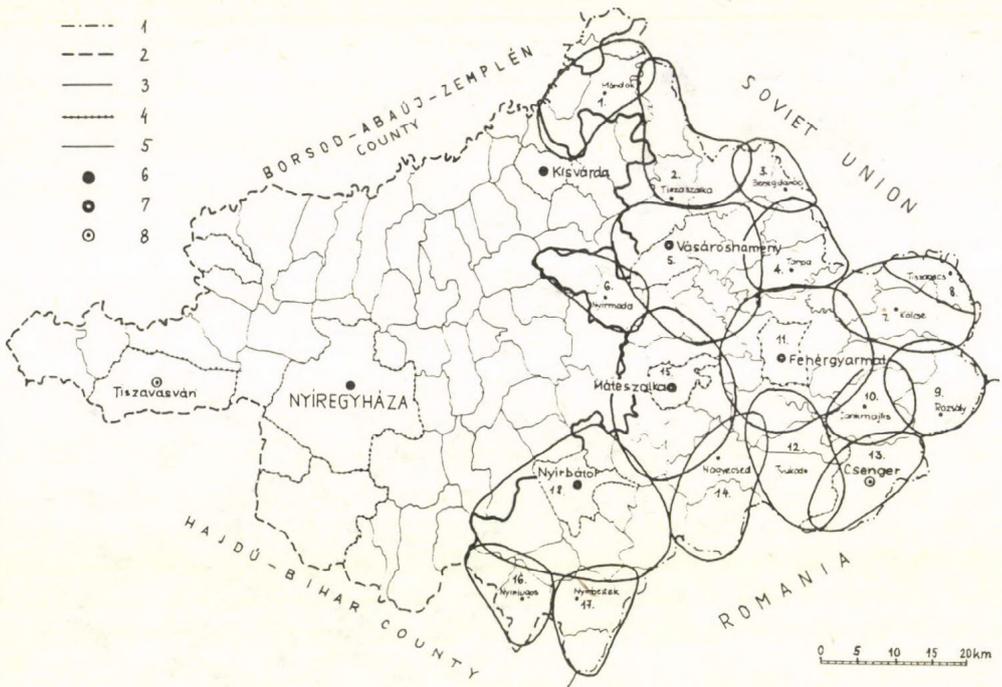


Fig. 3 Micro-district division of the economically under-developed regions (administrative divisions as of 1st January, 1984)

1 = natural frontier; 2 = county boundaries; 3 = urban hinterlands; 4 = the borders of towns, large villages with urban status and large villages; 5 = village limits; 6 = county seat; 7 = town; 8 = large villages with urban functions

duction. In addition to the creation of new workplaces, strengthening the ability of existing enterprises to retain manpower needs particular attention, both in agriculture and industry. The enhancement of employment opportunities, by contrast, is primarily a task for industry and more medium-sized industrial plants employing between 300 and 400 are clearly needed.

The territorial development of industry is determined by the distribution of labour. Accordingly it is reasonable to industrialize the towns that border the region as well as the towns and villages which form the natural centres of micro-districts (Fig. 3), of which the following may be

identified: Mándok; Tiszaszalka; Tarpa; Beregdaróc; Vásárosnamény; Fehérgyarmat; Mátészalka; Nyírbátor; Jánkmajtis; Kölcse; Rozsály; Csenger; Nagyecsed; Nyírlugos; Nyírbétek; Nyírmada; Tiszabecs and Tyukod. Given the existing economic structure, a policy based on the expansion of engineering, timber processing and the food industry would appear most sensible.

Support for agriculture is justified on the grounds that it is central to the present economic base, in terms of income generation and the employment opportunities it provides. Economic stability would also be helped by encouraging those enterprises that can utilise local resources. The productive infrastructure should also be enhanced in order to overcome existing bottlenecks and improve the economic effectiveness of actual and prospective enterprises. In this context, the improvement of the telecommunications network is especially important and is a major task for the VIIth Five Year Plan.

THE ROLE OF SMALL TOWNS AS SERVICE CENTRES FOR THE UNDER-DEVELOPED REGIONS

Industrialization has been the most important economic activity in the underdeveloped regions of Szabolcs-Szatmár in the last few decades. It has influenced the living conditions and social relations of the population, and has been fundamental in the creation of new employment opportunities. Because development has been concentrated spatially on the most accessible settlements, it has gone hand in hand with the growth of commuting and migration. As a result of this process, four settlements, the former county town of Mátészalka, plus Nyírbátor, Fehérgyarmat and Vásárosnamény, have been raised to urban status during the last decade.

However, despite these efforts, these regions still face considerable economic problems. They remain the least industrialized part of the county and are even substantially behind other weakly industrialized areas. The need for further industrialization is shown by the fact that many thousands of people leave each year for good because of the lack of work. In addition, 12-15 thousand residents work temporarily outside the county, particularly in Budapest.

Despite the advent of less favourable economic circumstances in recent years, these towns have continued to expand since 1980. Thus, although new investments were not fully realised and the basic structure of industry has not changed, the number of industrial employees in Mátészalka has grown by about 10 per cent in the last five years, and similarly in Nyírbátor. In Fehérgyarmat the increase in the number of industrial employees has been even greater and has been well above that of settlements of similar size; further development is clearly justified both in the town and surrounding settlements. As for Vásárosnamény, industry there must also be expanded further to create more employment in an area where currently there is relatively little work. Industrial employment in the town amounts to about 1600 jobs, most of which are to be found in small firms. MEDICOR and the State Glass enterprise have a more substantial presence but together do not employ more than 600 people. The principal indices of socialist industry in the four centres is presented in *Table 1*.

Table 1 A comparison of socialist industry, 1985

Town	Employees in socialist industry					Gross value of investments as a percent of the county total
	Percentage change since 1980		Per 1000 inhabitants			
	Stated town	Settlements of similar size	Stated town	Settlements of similar size		
Fehérgyarmat	112.3	99.3	259	154	2.5	
Mátészalka	109.7	96.1	290	197	11.7	
Nyírbátor	105.0	102.4	233	186	4.3	
Vásárosnamény	107.0	99.3	180	154	1.6	

Given the characteristics of the county, agriculture is also an important branch of the urban economy. The local co-operative and state farms are active in supplying the towns while food processing offers considerable employment

possibilities. In Mátészalka the Szamosmenti State Farm, covering a total area of 8.6 thousand hectares, employs more than 1300 persons of whom 56 are experts with higher degrees. Its productive structure is characterized by a high level of supplementary activity, with food processing contributing nearly half its gross income. The fattening and processing of pigs is also particularly important, and the farm plays an important role in supplying meat to the whole district. The Szatmárkert Fruit Production Combine, which was formed through the collaboration of the state farms and 31 agricultural co-operatives, has become the largest apple growing and processing enterprise in the country. The co-operatives are also actively involved in local supply and, given the local climate and soil types around Fehérgyarmat and Vásárosnamény, mainly emphasise animal husbandry, although efforts are being made to develop supplementary activities.

As a result of the development of commerce, the towns can now more effectively serve as local centres. The quality of provision is powerfully influenced by the floor space devoted to the commercial network which, in its rate of expansion, now exceeds the average found in settlements of similar size. The commercial attraction of the towns of the region is well exemplified by the fact that per capita sales turnover is generally higher than in similar settlements, especially in respect of the sale of industrial goods (*Table 2*). Of the towns, only Vásárosnamény lacks such an outlet while its specialist shops also need development. Mátészalka is a significant central place and scores highly on indices of both per capita floor-space and sales turnover. Similarly, retail floor-space and turnover are also high in Fehérgyarmat, which has become the commercial centre for the surrounding area as a result of the developments of past years.

These towns must also play an important role in the expansion of the local tourist industry because visitors increasingly require suitable accommodation. However, in this respect Vásárosnamény, Nyírbátor and Fehérgyarmat are well behind similar settlements in other parts of the country

and considerable development is clearly necessary (Table 2). There is no hotel in Nyírbátor despite the fact that the town is a tourist centre of European importance. The number of foreigners attending the Music Festival and other events could be increased if suitable accommodation were available. Similarly, Fehérgyarmat, Mátészalka and Vásárosnamény could cater for visitors to the Szatmár-Bereg region, where the potential for tourism is considerable: for instance, it contains important examples of folk-architecture, places of literary importance, and other recreation activities connected with the river Tisza.

Table 2 Commercial provision and tourist accommodation

Town	Floor space		Sales turnover		Availability of beds	
	Retail outlets per 1000 inhabitants	Commercial catering trade outlets per 1000 inhabitants	Total retail	Industrial goods per capita	Total per 1000 pop.	In hotels
as a percentage of the average for settlements of similar size						
Fehérgyarmat	129.5	95.1	141.8	151.0	5.7	34.0
Mátészalka	132.1	72.2	126.2	134.2	33.1	142.9
Nyírbátor	101.2	55.0	102.8	112.7	5.4	-
Vásárosnamény	105.4	94.5	110.2	111.5	73.9	78.7

The central role played by the towns of the region is exemplified by the buoyant demand for housing, inflated by the effects of in-migration. Since 1980 the dwelling stock has increased more rapidly in the towns than villages even though the number of dwellings built in the last 5 years fell behind the average for the previous planning period. Moreover the average rate of urban building in the region continues to exceed the national average in settlements of similar size, but even so overcrowding remains higher than

in the country at large. More dwellings were built in Fehérgyarmat and Vásárosnamény during the Vith Five Year Plan than previously, but fewer in Nyírbátor. Most dwellings were built in Mátészalka, of which 4% had 3 or more rooms, while 77% of the dwellings built in 1985 in Vásárosnamény had mains gas supply. In 1985 85% of households on the waiting list were provided with new dwellings in Nyírbátor and 53% in Vásárosnamény. Private house-building is also widespread in these towns with many families literally building their own homes. Selected housing indices are presented in *Table 3*.

Table 3 Housing indices

Town	The number of dwellings built in 1981-5 as a percent of the average for 1976-80 ^a		Dwellings funded from state resources in 1981-5 as a percent of all dwellings constructed		Population per 100 dwellings (1985)	
	Stated town	Settlements of similar size	Stated town	Settlements of similar size	Stated town	Settlements of similar size
Fehérgyarmat	119.7	81.0	18.8	12.7	312	279
Mátészalka	115.2	77.2	22.2	16.6	325	290
Nyírbátor	71.1	95.6	23.8	16.1	320	289
Vásárosnamény	119.5	81.0	19.9	12.7	319	279

By contrast, the number of telephones per 10,000 inhabitants is considerably below that in towns of similar size and the telecommunication network calls for considerable development. The situation is better in Mátészalka, which only lags a slightly behind the national average, than in Fehérgyarmat and Vásárosnamény, while Nyírbátor is least well endowed in this respect.

COMMUTING

There are many factors which influence the rate of commuting. These include: the distribution of settlements in relation to the main centres of employment, the size of towns and cities, the quantitative and qualitative characteristics of workplaces, communications etc. The Hungarian settlement network has been greatly affected by the extension of daily commuting patterns, and the primary difference nowadays is not necessarily that between town and village but whether a settlement is part of an urban agglomeration or rural region. It is therefore not entirely unexpected to find that commuting is most pronounced in small settlements close to towns, where the rate may exceed 76%.

In Szabolcs-Szatmár county, Nyíregyháza is the largest centre of attraction and, in terms of the daily inflow of commuters, stands in sixth place nationally behind Budapest, Miskolc, Győr, Debrecen and Székesfehérvár. In other words, its attraction to commuters is greater than that of the main provincial cities of Pécs and Szeged. The relative level of commuting into the other towns of the region is also substantial. The daily inflow of workers into Mátészalka is almost as large as the resident earning population, which places the town in the same rank as Baja, Ózd and Sopron. Similarly, the rate of commuting into Kisvárdá exceeds that into important industrial centres like Ajka, Cegléd, Gyula, Hatvan, Jászberény and Várpalota. Commuting into Fehérgyarmat and Vásárosnamény is also high compared with towns of similar size because of the large number of small rural settlements in the areas that surround them (*Table 4*).

The more important commuter centres, where daily inflows exceed 300 people, are to be found in the west of the county, and relatively few are located in Szatmár-Bereg where workplaces are more dispersed (*Fig. 4*). Thus, in addition to the small towns, the canning plant at Tyukod, the shoe factory at Csenger, and the steel-goods works in Tizzaszalka each provide employment for more than 50 daily commuters.

Table 4 Commuting patterns, 1980

Characteristics of each centre	Fehérgyarmat	Mátészalka	Nyirbátor	Vásárosnamény
Population	8 414	17 804	13 371	8 654
Daily population	10 874	24 961	15 505	10 995
Resident work force	3 489	7 406	5 330	3 497
Frequent visitors	248	426	328	376
Active earners living locally	3 737	7 832	5 658	3 873
Commuters	2 708	7 583	2 462	2 717
Local work force	6 197	14 989	7 792	6 214
Ratio of workers to active earners(X100)	165.8	191.4	137.7	160.4

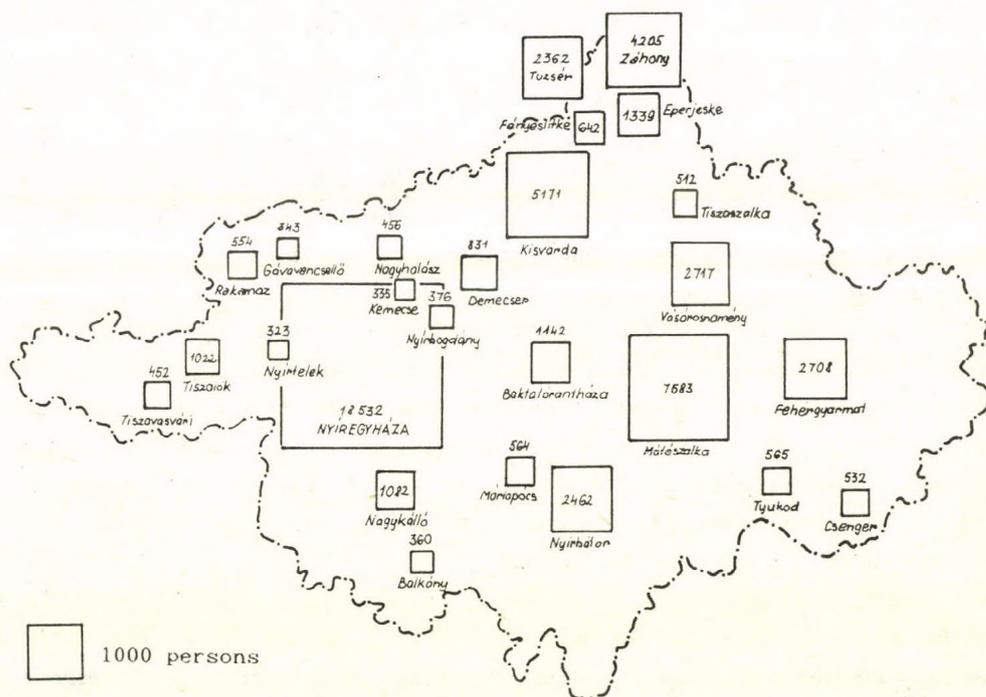


Fig. 4 Settlements where daily influx of commuting exceeds 300 people, 1980

Among commuters males outnumber females. In addition, although commuting within the secondary sector is generally low, it is high in Mátészalka and Vásárosnamény because of

the effect of the ERDÉRT works which processes timber imported from the Soviet Union. The breakdown of commuters into manual and non-manual workers varies little among the different centres of attraction, 82-85 per cent being manual workers, because the determining factors are everywhere similar. But that said, Fehérgyarmat attracts the highest proportion of commuters with qualifications.

The journey to work areas of settlements with a daily inflow of more than 100 workers are presented in *Fig. 5*. To ensure geographical contiguity, settlements have been nested by administrative area, which serves to emphasise the journey to work area of Nyíregyháza. It may be observed that settlements straddling the Debrecen-Záhony railway belong to one or other of two journey to work areas, while in the Szatmár-Bereg region contiguous rural areas may be found that focus on no journey to work area. The journey to work areas of Mátészalka and Kisvárda are well developed and regular but those of Nyírbátor, Fehérgyarmat and Vásárosnamény are less coherent. For instance, Záhony affects Vásárosnamény by drawing in workers who might otherwise seek employment there. Generally, however, it is average journey time that most affects the patterns once allowance has been made for the distribution of employment opportunities. Each commuter seeks to minimise travelling time so as to maximise the time available for leisure and, because of this, some villages exert a considerable influence on their immediate surroundings. But equally, it is only in the towns that a wide assortment of workplaces is found.

There are numerous villages in the region that lie outside any journey to work area. This, however, places them at a considerable disadvantage because being part of a journey to work area is an essential condition for retaining population since this broadens the employment opportunities of local residents. Theoretically, this may be achieved by improving communications, but in practice no great improvements can be expected. Thus VOLÁN, the national bus company, regards its present network and frequency of service as appropriate

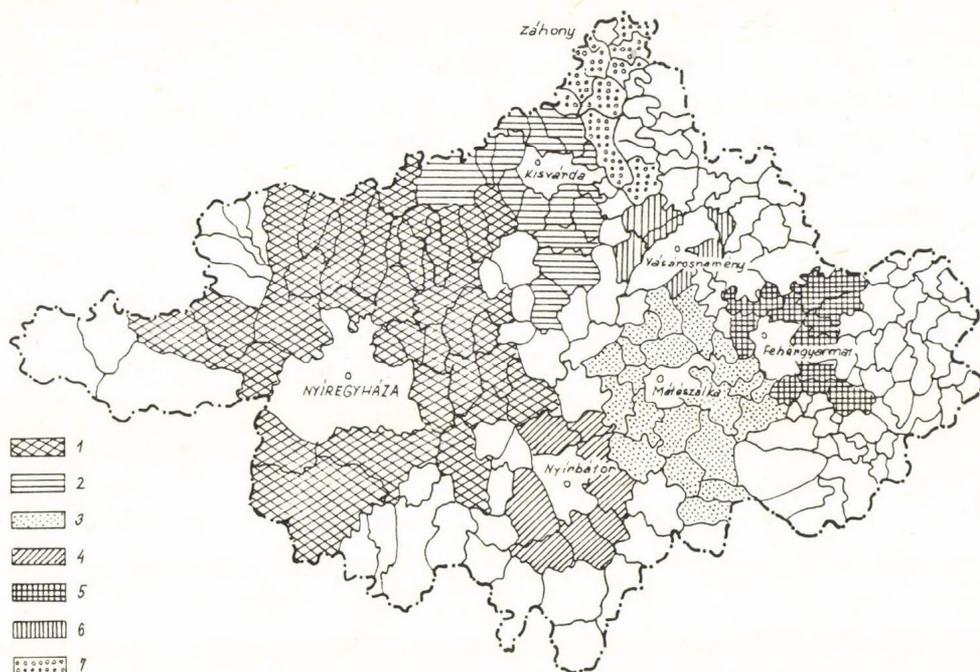


Fig. 5 Journey to work areas in Szabolcs-Szatmár County

- 1 = Nyíregyháza; 2 = Kisvárdá; 3 = Mátészalka; 4 = Nyírbátor;
 5 = Fehérgyarmat; 6 = Vásárosnamény; 7 = Záhony

for the region, and passenger demand that can be catered for economically is already satisfied. Limited improvements could, however, be made by extending time-tables, although that would require more buses. The aim should be to create a position whereby every settlement is within one hour's travel time of the nearest town. Since distances are rarely more than 30 km this should be possible, although data on the distribution of bus season tickets shows that 92 per cent of holders travel less than 20 km to work, which seems to define the acceptable travel distance at the moment.

For journeys of more than 20 km, the sale of ordinary tickets exceeds that of season tickets, although the majority of the former are still within the 20 km limit. Fares were

increased in 1982, but this did not lead to any slackening of the rates of commuting or out-migration from the villages. Nonetheless, because of the fares increase, it has become more difficult for villagers to avail themselves of urban services, and new initiatives, for example the postal delivery of medicines to rural settlements with no pharmacy, are plainly needed. Clearly, daily commuting will remain an important socio-economic phenomenon for the foreseeable future, and may well increase in the county because of inequalities in the spatial distribution of employment opportunities. The public transport system has to be radically improved not only to ease the stress of daily commuting but also to bring it within the possibility of all the settlements of the region.

Two comments seem appropriate by way of conclusion. Considerable progress in the development of the region would be made possible by opening more frontier crossing points into neighbouring countries, which would facilitate transit traffic and the development of transport axes. Otherwise the fundamentals for tourism are favourable. Some of the least polluted air and water in Central Europe is to be found in the region and the creation of a flourishing tourist business would be assisted by propagandising its attractions and developing the necessary infrastructure. Secondly, the most significant key to development is the radical improvement of the intellectual infrastructure and the level of technical expertise. Investment in new development may well be ineffective if the quality of the labour force is not improved. State assistance, as now happens in agriculture, is needed in other branches of the economy, because without sufficient doctors, pharmacists and teachers, it will be impossible to resolve the shortage of other experts in, for instance, state management.

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NEW FEATURES OF THE LINKAGES BETWEEN TANYAS (FARMSTEAD SETTLEMENTS) AND TOWNS IN THE GREAT HUNGARIAN PLAIN

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INTRODUCTION

Hungarian *tanyas* are a type of scattered agricultural settlement, which share many external characteristics with similar settlements in other parts of Europe, but which are unique as regards their social features. It is for this reason that the word *tanya* cannot be precisely translated. Moreover, an historical examination of their evolution, their functions, and of their place in the settlement network of Hungary all testify to this uniqueness. ERDEI (1939) has played an important role in listing their characteristic features; he considered the very close linkages that existed between the *tanyas* and nearby urban settlements to be one of the most characteristic attributes of the rural market towns of the Great Plain of the 1930s. Although geographical, historical, ethnographic and sociological research has revealed most of the features of the development and transformation of the *tanya* system, the question of the precise nature of the linkages between *tanyas* and towns has not received the same attention. While it is not the aim of the present paper to make up for this deficiency, this topic will be stressed. After a short review of the historical antecedents, the linkages between *tanyas* and towns on the Great Plain will be evaluated by means of the changes that have taken place in

demographic structure and composition of dwellings during the last decades: and interpretation of the present state of these linkages will also be offered.

HISTORICAL ANTECEDENTS

Since the important phases in the development of the *tanya* system are thought by Hungarian scholars to have taken place at different times, it is almost impossible to set out general principles about their evolution since they emerged on the Great Plain at different times and through different processes. Rather than present the views of various scholars on this matter and describe the regional differences in detail, we shall highlight those aspects considered important from the point of view of the topic under discussion, as set out in the works of F.ERDEI (1942), E.LETTRICH (1969) and I.RÁCZ (1980).

The roots of the *tanya* system date back to the turn of the 15th and 16th centuries. Unviable, sparsely populated, villages began to decay, as depopulation created abandoned land around their fringes. However, a century later Turkish rule totally transformed the economy and settlement pattern of the Great Hungarian Plain. Small villages, except for watering places, were destroyed and the surviving inhabitants sought refuge in the larger settlements, especially in towns ('khasz') constituting the domain of the Turkish sultan. In this way, the size of the agrarian population of these towns increased, and their territory was extended, while extensive livestock breeding became the dominant agricultural activity. As a result, a 'split settlement system' began to emerge in most places, whereby the dwelling houses of the inner residential areas became increasingly distinguished from the farm-yards with outbuildings in the next and draught and milking animals in the outermost zone. This split system promoted the cultivation of surrounding arable land and also provided the accommodation (stock-yards and herdsmen's huts) needed for grazing the more distant steppes.

With the ending of Turkish rule, the depopulated steppes were gradually re-populated by serfs, and by the middle of the 18th century all empty pasture land had been taken up and corn growing became important. In the agrarian towns and giant villages, arable cultivation has often extended over great distances (10 to 25 kms); and, because of the need to maintain close linkages with livestock breeding, *farm-yards became dispersed throughout the arable area and out of them tanyas were established*. In the initial stage of development, *tanyas* served only as temporary dwellings e.g. during seasonal work, and their owners retained a permanent dwelling in the inner residential areas. In this way *tanyas* grew up not as independent settlements but as settlements belonging directly to the adjacent towns or giant villages.

In the first half of the 19th century, labour intensive crops - such as hoe crops - began to appear in addition to livestock breeding and the traditional crop types. As population increased, so the pressure on the existing arable land intensified, leading directly to large-scale river regulation and drainage programmes to increase the agricultural area. Lands lying further away from inner areas were also allotted. Through this process the *tanya system of farming and settlement became general throughout the Great Hungarian Plain*.

The intensive agricultural economy demanded that farmers spend more and more time on their *tanyas*. Moreover, as a result of a new system of inheritance, the disintegration of large families and the introduction of individual (private) land ownership, together with changes in farming technology and land use, *tanyas* were gradually transformed into permanent residences during the 19th century. Socially, they were all stratified, but as the linkages with the inner residential areas became increasingly differentiated, and generally looser, so various *tanya* regions and landscapes began to emerge as in the Nyírség, Hajdúság, Nagykunság and Duna-Tisza Interfluve (ERDEI, 1942).

'Rich peasant *tanyas*' became completely separated from their urban antecedents' households, and evolved into farms

employing servants as wage earners.

As far as 'small holders' *tanyas*' were concerned, the split occurred even earlier as successive generations of the same family were divided into two. Young farmers tended to conduct a way of life suitable for permanent living in *tanyas*, while parents' homes served for regular, weekly, visits to market, for church-going on Sundays, and for family celebrations. In addition, the babies were born there and, later, the children attended school in the central settlement. It was also the place to retire. Indeed, through the development of these customs and the marketing of farm products, the linkages between *tanyas* and towns became even closer than they had been when the *tanyas* provided seasonal accommodation only.

In addition to the traditional types of *tanyas*, there came into being what are called 'crop-sharing *tanyas*', partly due to the rising middle classes and the increasing number of people owning no property and the number of small holders. As crop sharing meant a payment, the performance of services demanded that tenants should keep in regular touch with urban owners. Moreover, the *tanya* population aimed at saving as much money as necessary to move to town for their old age.

The inhabitants of 'farm-*tanyas*' had similar objectives, and this type became widespread for economic and property reasons. As the name suggests, they were broadly similar to other types of European scattered settlement. These *tanyas* also served as the only homes for their owners, who in consequence stopped having economic or close family ties with a home in the nearby town.

Although ERDEI (1939, 1942) overestimated somewhat the importance and closeness of linkages between *tanyas* and towns, it is still the case that these linkages were more important than usually found between rural and urban places. But although the 'external' socio-economic linkages between *tanyas* and towns were much more intensive, their 'inner cohesion' proved to be less strongly developed than in villages.

After the Second World War, the *tanya* system underwent considerable transformation. As a result of the land reform

in 1945, substantial numbers of people were provided with land for the first time, which led to the establishment of 75,000 new *tanyas*. It was the final boom, however, and did not last. In the 1950s, the *tanya* system began to disintegrate and this process was speeded up in the early-1960s due to the socialist re-organization of agriculture. Subsequently, the functions performed by *tanyas* have changed totally. Most of their inhabitants are now employed in large-scale farming and they are restricted solely to part-time or auxiliary farming activities on their *tanyas*, on plots of 0.5 to 5 hectares. In most places, the original farming function of *tanyas* has lost its importance, and all they serve now is a residential function.

Between 1949 and 1970, the population of the outer areas of the Great Plain decreased by some 380,000 or to 40 percent, which led to the substantial disappearance of *tanyas* in the Trans-Tisza Region and to a lesser extent in the Duna-Tisza Interfluve. Moreover this process was accompanied in the 1950s by a policy towards the *tanyas*, being unable to prevent the deterioration of living standards, encouraged population either to move into the towns or to concentrate into 'tanya' villages. There was a tendency to separate the *tanya* areas administratively from the rural market towns and giant villages and to designate them as new villages. As this policy failed to take into consideration traditional linkages, it proved to be rather unsuccessful and people were reluctant to move into the new designated rural centres. At the same time, research carried out on the Duna-Tisza Interfluve revealed the formation of new, viable, clustered settlements as a consequence of the concentration of the *tanyas* (CSATÁRI and ENYEDI, 1986).

Since the above changes have influenced the linkages between *tanyas* and towns, specific answers are needed to questions about how these linkages were shaped in the first place and how their nature and intensity has since developed.

IMPORTANCE OF LINKAGES BETWEEN TANYAS AND TOWNS - STATISTICAL EVIDENCE

One approach to characterizing the linkages between *tanyas* and towns is through investigating the effects of towns on the socio-economic development of *tanyas*. Such an evaluation should, naturally, have some kind of basis for comparison and in this context two factors have been considered:

- transformation through time (specifically the period 1970 to 1980), and
- comparison with a similar system of linkages, in this instance the effects of non-urban settlements on *tanyas*.

Demographic structure and composition of dwellings comprise useful measures of change, although their usefulness is somewhat constrained by the nature of the statistics:

Statistical data are only available for inner and outer areas and not for *tanyas*. The category 'outer residential areas' includes other scattered types of settlements, as well as *tanyas* proper (e.g. watch-cabins, dam-keepers' houses, and isolated buildings of state agricultural farms). However, the proportion of such scattered settlements on the Great Hungarian Plain is low, and the distinction between 'proper *tanyas*' and 'outer residential area' will be ignored.

The investigations covered six of the counties of the Great Plain, namely Bács-Kiskun, Békés, Csongrád, Hajdú-Bihar, Szabolcs-Szatmár and Szolnok. However, it would have been more accurate to have included the southern part of County Pest, which contains numerous *tanyas*, while excluding north-eastern and eastern Szabolcs-Szatmár County where *tanya* settlements have largely disappeared during recent decades; this would also apply to minor areas of Counties Békés, Szolnok, and Hajdú-Bihar. The data, however, are only available at the level of counties, and analyses based on a more accurate delimitation of the *tanya* region are thus precluded.

The Great Plain towns examined do not include all towns which formerly had *tanyas*, because we have had to rely on administrative definitions (ERDEI, 1939).

Data on outer residential areas are collected once every ten years in the Population Census, and the most recent information is now eight years old, relating back to 1980. Finally, it should also be noted that eight former rural settlements on the Great Plain have been designated as towns since 1980 but for data reasons cannot be taken into account.

The important findings that come out of the analysis are as follows:

The population of outer residential areas on the Great Plain decreased by 214,000 or 43.4 per cent between 1970 and 1980. Since the decrease was smaller in towns, around one-third of the *tanya* population now lives in the 34 towns of the region (*Table 1* and *Fig.1*).

In the 1970s the *tanyas* were inhabited by an ageing population and the proportion of elderly exceeded both the national average and that of the Great Plain. Judged by both age structure and an ageing index (ie. the ratio of those aged 60 and over to those under the age of 15), the population is younger in the outer residential areas of towns than in those of villages (*Table 2*). The picture was similar even in 1970 but disparity has subsequently widened due to the more rapid deterioration of the age structure of the *tanya* rural population.

As a result of diverse processes, we now find a greater concentration of the elderly in the outer as opposed to the inner residential areas of towns although the difference is comparatively minor than in the case of the villages.

The *employment structure* of the population of the outer residential areas underwent considerable change during the 1970s. The present, more urbanized, population structure is only partly accounted for by actual employment restratification, and a greater role has been played by migration which has had the effect of reducing the number of active earners in agriculture to less than one half, while the number employed in industry has fallen slightly more than 75 per cent of its previous figure. Actual urbanization is, however, reflected by 1980 in a quantitative increase in the tertiary sector.

Table 1 The population of the outer residential areas of the Great Plain between 1970 and 1980

Settle- ments	Population		Population		Population change	
	Number	%	Number	%	in the outer of outer areas residential areas	
	of outer areas in 1 9 7 0*		of outer areas in 1 9 8 0*		Number	%
Towns	146,187	11.9	91,645	6.6	- 54,542	-37.3
Villages	346,291	19.6	187,170	11.2	-159,121	-46.0
Total	492,478	16.4	278,815	9.1	-213,663	-43.4

*Data for 1970 were calculated by towns in 1980

Source: Data for census districts and associated outer residential areas were calculated from the County Volumes of the Population Censuses for 1970 and 1980; Central Statistical Office, Budapest

All in all, the importance of agriculture has diminished while that of industry and other branches has grown (Table 3).

This process of transformation has been somewhat different in *tanyas* associated with villages than in those linked with towns, as exemplified by the fact that the number of active earners in agriculture and especially in industry decreased to a smaller extent in the *tanyas* associated with the towns. Indeed, in respect of the tertiary sector, the disparity was very substantial, with the growth in *tanyas* associated with villages amounting to a mere 2.5 per cent in the case of those linked with towns.

In conclusion it can be stated that not only did the employment structure change but the gap between the *tanyas* associated with towns and villages respectively has widened. Even today, 46.3 per cent of the population of the outer residential areas of the towns are employed in agriculture which is 2.5 times the national average of 18.5 per cent. But when one takes account of the former pre-eminent role of farming in

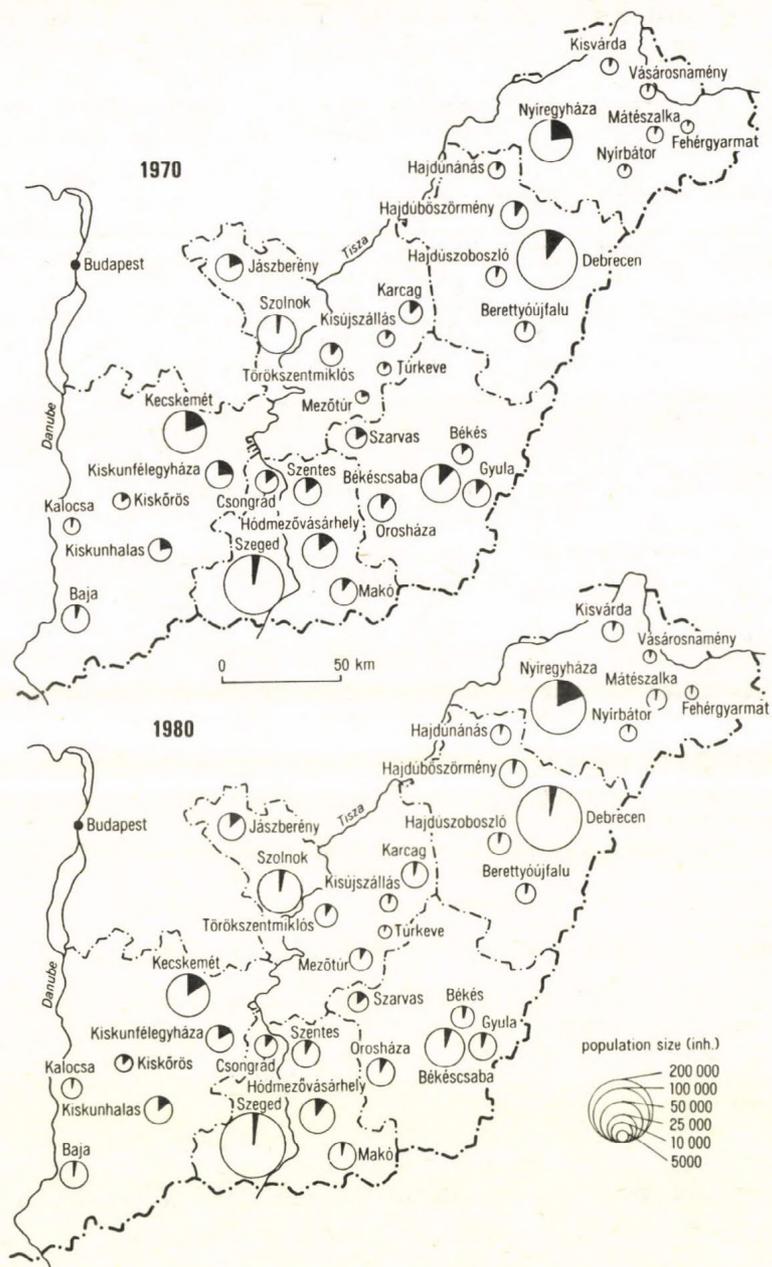


Fig. 1 The population of the outer residential areas as a per cent of the town population of the Great Hungarian Plain

Data for 1970 were calculated by towns in 1980

Table 2 Distribution of population in the Great Plain by major age groups

Areas	0-14 %	15-39 %	40-59 %	60-x years %	Index of ageing
1970*					
Outer residential areas of towns	25.1	36.6	23.2	15.1	0.60
Outer residential areas of villages	24.7	33.8	24.6	16.9	0.68
Total	24.8	34.6	24.2	16.4	0.66
Inner residential areas of towns	20.4	39.0	23.6	17.0	0.83
Inner residential areas of villages	24.7	33.0	24.1	18.2	0.74
Total	22.8	35.6	23.9	17.7	0.77
1980*					
Outer residential areas of towns	21.1	35.2	26.0	17.7	0.84
Outer residential areas of villages	19.4	31.6	28.1	20.9	1.07
Total	20.0	32.8	27.4	19.8	0.99
Inner residential areas of towns	23.1	38.1	23.1	15.7	0.68
Inner residential areas of villages	23.5	33.0	25.6	17.9	0.76
Total	23.3	35.4	24.4	16.9	0.72

* Data for 1970 were calculated for the towns as designated in 1980

Source: Data for census districts and associated outer residential areas were calculated from the County Volumes of Population Censuses for 1970 and 1980; Central Statistical Office, Budapest

the *tanya* economy, these data in themselves are indicative of the extent of the transformation. The proportion employed in the tertiary sector has grown significantly (25.4 per cent), and by 1980 had almost reached the same level as industrial employment in the same year (28.3 per cent).

Table 3 Distribution of active earners on the Great Hungarian Plain by branches of the national economy

Area	Total	Industry, building industry		Agriculture		Other	
		Number	%	Number	%	Number	%
1970*							
Outer residential areas of towns	63,070	14,605	2.2	39,432	62.5	9,033	14.3
Outer residential areas of villages	166,282	22,312	13.4	130,301	78.4	13,669	8.2
Total	229,352	36,917	16.1	169,733	74.0	22,702	9.9
Inner residential areas of towns	498,783	196,784	39.5	116,471	23.3	185,528	37.2
Inner residential areas of villages	617,299	181,789	29.4	306,637	49.7	128,873	20.9
Total	1,116,082	387,573	33.9	423,108	37.9	314,401	28.2
1980*							
Outer residential areas of towns	42,718	12,108	28.3	19,787	46.3	10,821	25.4
Outer residential areas of villages	87,786	16,166	18.4	57,605	65.6	14,015	16.0
Total	130,504	28,274	21.7	77,394	59.3	24,836	19.0
Inner residential areas of towns	606,070	260,764	43.0	67,837	11.2	277,469	45.8
Inner residential areas of villages	660,802	202,463	30.6	261,079	39.5	197,260	29.9
Total	1,116,0	463,227	36.5	328,916	26.0	474,729	37.5

*Data for 1970 were calculated for the towns as designated in 1980

Source: Data for census districts and associated outer residential areas were calculated from the County Volumes of the Population Censuses for 1970 and 1980; Central Statistical Office, Budapest

Although structural modification also occurred in the *tanyas* associated with villages, the relevant data indicate an even less urbanized population. Moreover, the difference between the employment structures of the *tanya* populations associated with the towns and villages widened progressively during the 1970s (Table 3), and demonstrate the impact of parent towns on *tanyas*. The wide variety of labour opportunities provided by the central settlements is of great importance for the population of the outer residential areas. Their special way of life, however, continues to be decisive, and their occupational structure is consequently more at variance with that of the population of the inner areas than that of the population of the villages.

Concerning the level of education of the *tanya* population, a considerable improvement occurred during the period under examination, following the national trend. While the number of inhabitants over 15 years of age decreased considerably in the outer residential areas, the number within the same age group who had completed at least 8 years of elementary school increased in the *tanya* region of the towns from 36.5 to 51.9 per cent (Table 4). The population in the *tanyas* of villages improved their level of education, but the differences between the *tanya* populations of the towns and villages still widened.

An essential distinction between the levels of education of those living in inner and outer residential areas can still be made, especially for the towns. Moreover, intra-town differentiation has tended to diminish whereas intra-village differentiation has tended to increase. Thus, the application of the above index to 1980 data shows that the level of education in urban outer residential areas was the same as that of the population in the inner areas of villages.

Socio-economic development during the last ten years has also affected *housing conditions*. The number of dwellings in *tanyas*, particularly in those around villages,

Table 4 Distribution of population of the Great Hungarian Plain by level of education

Area	Total	Number and percent of those aged 15 years or older finishing at least 8 years of elementary school	
1970*			
Outer residential areas of towns	102,076	337,244	36.5
Outer residential areas of villages	265,601	81,750	30.8
Total outer residential areas	367,677	118,994	32.4
Inner residential areas of towns	832,288	478,420	57.5
Inner residential areas of villages	1,089,451	391,737	36.0
Total inner residential areas	1,921,739	870,157	45.2
1980*			
Outer residential areas of towns	72,271	37,480	51.9
Outer residential areas of villages	150,765	66,303	44.0
Total outer residential areas	223,036	103,783	46.5
Inner residential areas of towns	994,615	709,231	71.3
Inner residential areas of villages	1,134,076	600,318	52.9
Total inner residential areas	2,128,691	1,309,549	61.5

*Data for 1970 were calculated for the towns as designated in 1980

Source: Data for census districts and associated outer residential areas were calculated from the County Volumes of the Population Censuses for 1970 and 1980; Central Statistical Office, Budapest

(Table 5)., while the number and proportion of dwellings with two or more rooms together with water supply, bathroom and electricity has grown. Again, however, these indices are differentiated between town and village *tanyas* - in the former the number of dwellings with bathrooms rose by 131.5 per cent between 1970 and 1980 but in the latter by only 80.1 per cent. Thus, one may again conclude from these measures that the differences between village and town *tanyas* have widened, with the exception of the proportion of dwellings with two or more rooms. It is worth mentioning that the *tanyas* substantially lag when compared with the housing facilities of the central settlements.

In summary, the impact of parent settlements is very evident in the case of *tanyas* associated with towns. During the last ten years, the urbanization of the *tanyas* has commenced and is continuing to spread. Yet, the *tanya* system cannot be regarded as homogeneous, and significant distinctions can be made between the *tanyas* linked with towns and those linked with villages. Indeed, these distinctions are becoming wider rather than narrowing.

Finally we should remember that the above is the average picture for the Great Hungarian Plain. The problems of the *tanya* settlements of Bács-Kiskun county, for example, where vines and fruit are grown are very different from those of Szolnok county with its large-scale arable cultivation. Moreover, 12 per cent of the urban population of Bács-Kiskun live in *tanyas*, compared with only 4 per cent in Szolnok. It is features like these which explain why regions deviate both from each other and from the national average.

SOME CHARACTERISTICS OF THE NATURE OF THE LINKAGES BETWEEN TANYAS AND TOWNS

Empirical experience is needed to understand the general nature of the linkages between *tanya* settlements and towns, and here the professional literature provides considerable help. In this case, data obtained from an empirical study of the town of Orosháza carried out in the early 1980s may serve as an example (TIMÁR, 1984).

Table 5 Major data for residential buildings in the Great Hungarian Plain

	Dwellings total	Outer residential area						Dwellings having 2 or more rooms	
		Dwellings supplied with electricity		running water		bathroom or lavatory			
		number	%	number	%	number	%	number	%
1970*									
Towns	44,778	13,185	29.4	1,624	3.6	2,262	5.1	9,683	21.6
Villages	119,017	32,103	27.0	3,199	2.7	4,993	4.2	29,811	25.0
Total	163,795	45,288	27.6	4,823	2.9	7,255	4.4	39,494	24.1
1980									
Towns	34,206	21,313	62.3	4,385	12.8	5,236	15.3	13,295	38.9
Villages	78,633	45,039	57.3	7,636	9.7	8,992	11.4	32,143	40.9
Total	112,839	66,352	58.9	12,021	10.7	14,228	12.6	45,438	40.3
Inner residential area									
1970*									
Towns			96.0		34.7		33.0		51.9
Villages			88.9		6.6		11.1		51.2
Total			91.8		18.2		20.2		51.5
1980									
Towns			99.3		70.2		66.7		74.8
Villages			97.7		38.9		40.3		72.1
Total			98.4		53.2		52.4		73.3

*Data for 1970 were calculated for the towns as designated in 1980

Source: Data for census districts and associated outer residential areas were calculated from the County Volumes of the Population Censuses for 1970 and 1980; Central Statistical Office, Budapest

Transport plays a decisive role in the formation of spatial linkages. Nowadays access to urban centres from the outer residential areas is relatively easy, mainly because horse-drawn transport has gradually lost its importance through the spread of motorisation (ROMÁNY, 1973). Public transport, especially buses, now provides access to outer residential areas, although it must be said that the decision to close the system of narrow-gauge railway lines was not always the right one.

The great majority of *tanyas* are still found at some distance from their parent settlements and also from the nearest main roads. According to a survey undertaken by the Institute for Urban Construction and Planning (VÁTI) in 1970, over three-quarters of the population of outer residential areas of the Great Hungarian Plain live 3 to 10 kilometres, and a further 8 per cent more than 10 kilometres, from the centre of the inner area. This investigation also revealed a significant decrease of population in these more distant regions. According to projections, an increasing part of the *tanya* population will be provided with relatively better transport facilities in the future.

Finally, in several places we can observe a phenomenon that is tending to diminish isolation, whereby the central settlement absorbs per-urban *tanya* dwellings. There are various ways in which this may happen:

- when an industrial plant is established in the neighbourhood of a town the *tanyas* in its vicinity may become a 'part' of the industrial zone;
- as the road network is extended out from the inner residential area, the *tanya* dwellings become incorporated into the town, as has happened in the case of the *tanyas* with Slovak population around Békéscsaba. After a while, as a result of this process, it becomes difficult to distinguish the *tanya* zone from the inner residential area;

- when housing estates are constructed on the periphery of towns a dichotomy is produced whereby high buildings made of concrete intermingle with the old adobe *tanya* dwellings;
- leisure garden activities are widespread and result in the building of tool-sheds, and even cottages, in those parts of towns designated for this purpose. This process may also lead to the incorporation of *tanya* dwellings into the town;
- the *tanyas* concentrated in *tanya* centres located on the peripheries of the larger towns of the Great Plain may attract population from the inner residential areas and from other settlements, thus producing what may be termed '*tanya* suburbanization' (BELUSZKY, 1982; CSATÁRI and ENYEDI, 1986).

It is not easy to decide which factors play the more important role in the way of life of the *tanya* populations: favourable developments such as the building of roads and the introduction of public transport, or unfavourable features in the towns such as air pollution and over-crowding. What is certain, however, is that close linkages between *tanyas* and towns can totally transform or even eliminate the *tanya* way of life.

Access to *tanya* settlements has become progressively easier and simultaneously the frequency of linkages has expanded. The most intensive links are represented by *daily commuters*. Although exact data are unavailable, it is estimated that 87 per cent of families in the urban *tanya* zone of the Great Plain contain non-agricultural wage earners.

In all probability, these wage-earners are employed in local towns (a questionnaire survey conducted in Orosháza recorded that only 8 per cent of commuters were employed in other settlements). This tendency is the very antithesis to the old relationship, namely 'urban dwelling and *tanya* workplace'. Another phenomenon, which can also be noticed,

is the growing tradition whereby the inhabitants of inner residential areas buy *tanyas* for farming or recreational purposes.

Since the collectivization of agriculture, most *tanya* wage-earners engaged in agriculture have not worked their own land, and this transformation has continued into the 1970s. As a consequence of the merger of co-operatives, a portion of the workforce may be engaged in further outlying parts of the farm, sometimes even in neighbouring villages. The *tanya* population has a rather ambivalent attitude to large-scale farms; the latter need the workforce but have a strong dislike for residential developments which may imperil cultivation. It seems rather pointless to try to represent the interests of the *tanya* population because the leaders, and most skilled workers, usually live in the inner residential areas (ERDEI, 1971).

Interdependence, although to a varying extent, also exists. The part-time and auxiliary farming activities of the *tanya* population supply the towns with many basic foodstuffs. However, many small producers now sell through the agricultural co-operative, and as a result the significance of the *weekly market* has decreased although it still forms part of the system of linkages (BELUSZKY, 1968).

Urban services strongly connect *tanya* populations to the centre, and many changes may be noted here during the last decade. For instance, elementary *schools* in *tanya* settlements have been closed, and many children now commute daily to school in the parent settlements. Other children still live in the towns during school term as was the case in the past, the one difference being that they are now accommodated in hostels whereas formerly they would have stayed in the homes of their grandparents. These children are expected to grow up as 'urban citizens'. Together with abolition of the schools in *tanya* settlements, buildings that had been used to house group meetings, clubs and movies have also ceased to function. As teachers have left the *tanyas*, there is now nobody left to organize public life. The outcome of this deterioration in the way

of life of *tanya* settlements is that inner linkages among *tanyas* loosen and that young people migrate increasingly to the towns.

The importance of *retail functions* should also be stressed. According to the survey data for Orosháza, about three quarters of *tanya* families responding shopped in the inner areas at least once a week. The number of those, however, who buy regularly in shops in the outer areas, at about 40 per cent, was higher than expected. In parts of County Bács-Kiskun where retail provision is highly organized (eg. well supplied mobile shops regularly visit the *tanyas*), the importance of shops in the outer regions is even greater. In other places, however, it is often the case that when shops are closed no substitute provision is made.

The other main reasons why the *tanya* population of Orosháza visit the town every second or third week include health care (68.3 per cent), *official business* (67.6 per cent) and *visits to family members* (47.6 per cent).

Today, few people own an urban dwelling in addition to a *tanya*. Earlier surveys (BELUSZKY, 1968; Institute for Urban Construction and Planning, 'VÁTI', 1974; TIMÁR, 1984) have estimated this proportion as between 3 and 6 per cent. The data for Orosháza, however, showed that over half of the *tanya* families had relations living in the town (in most cases their grown-up children). These linkages are expressly close, two-thirds of families visit their urban relatives at least once a week (or more frequently), and differ essentially from the old, family ties, which were based on mutual economic interests. It is not the adult children who visit the homes of parents which they will later inherit; rather, parents now visit their children who reside in modern, urban flats.

Finally, the investigations carried out in Orosháza allow us to refer to the continuation of an old characteristic feature of the *tanyas*, namely, that they are more closely connected with the inner residential areas than they are to each other. Between 1970 and 1982, only a quarter of the marriages contracted by the *tanya* population of Orosháza involved both couples coming from a *tanya* background.

In the majority of cases (43.6 per cent) one of the partners was an urban dweller of Orosháza and in this respect the importance of surrounding settlements has continued to grow (31.6 per cent) more rapidly than expected. 'External' linkages may be forecast to continue to widen spatially because those who leave the *tanya* settlements permanently are just as likely to move to another settlement as to Orosháza. Although some of the linkages between the *tanyas* and towns are tending to become closer even the local towns are not always able to retain the population who have left the *tanya* settlements.

CONCLUSIONS

Nowadays, the linkages between *tanya* settlements and towns differ both in intensity and in nature from those of the past. It cannot be denied that urban *tanya* settlements benefit from their proximity to a town, and the processes of urbanization have tended to transform these *tanyas*, not only earlier, but also to a greater extent than their counterparts associated with villages.

The pace, frequency and purpose of movements between inner and outer residential areas have also changed and in some respects have strengthened, eg. commuting to work, or visits for health care. Otherwise they have weakened as in the case of selling in the local market. The importance of these linkages varies greatly according to traditions and farming methods and depends not only on the type and location of the *tanya* settlements, but also on occupational structure, age profile, educational level and the way of life of the *tanya* population.

Further investigations are needed to reveal how *tanya* people regard towns; for example, is it true that they "go home" to the centre as suggested by ERDEI (1939) and ROMÁNY (1973). Also, investigations should be undertaken to explore the extent to which towns feel that the surrounding *tanya* regions belong to them.

As F.ERDEI wrote in 1939, despite the fact that *tanya* people spend a great deal of time on their *tanyas*, they do not comprise a special *tanya* community of interests. Rather, as urban dwellers, they struggle to meet their specific needs on the

tanyas. ERDEI took this as evidence that the *tanya* population belonged to a more developed community. His statement seems to be still true today, although for quite different reasons. However, the positive content is doubtful. Those who live permanently in *tanya* settlements suffer from deficiencies of basic supply and difficulties in their circumstances of life, the solution to which requires the joint representation of the interests of the *tanya* population. The institutions and personnel to oversee this are missing however. That is why the inhabitants of the outer residential areas, of necessity, still copy the examples of their ancestors, and fight for their rights individually.

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GEOGRAPHY AND ENERGY POLICIES

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ENERGY CRISES AND PUBLIC POLICY
ISSUES IN THE WEST - THE GEOGRAPHERS'
CONTRIBUTION

D. SPOONER

WHAT ENERGY CRISIS ?

1986 was an eventful year on the world energy scene. Two major developments startled the experts: a sudden drop in oil prices, and the explosion at the Chernobyl nuclear power plant in the USSR. A third development of great potential importance, but scarcely noticed by the media was the increase in Soviet natural gas production which followed the discovery in the early 1980s of three massive gasfields (Urengoi in S.Siberia, Yamburg above the Arctic Circle, and Sovetabad near the Iranian border). Soviet gas production in 1985 was 37.7% of world total, and more than 50% above its 1980 level (International Institute for Environment and Development, 1987).

In the light of two of these developments, it may seem perverse to talk of energy crises in 1987. What crisis? Although the recent predicament of the mined supertanker, Bridgeton, in the Persian Gulf has been an uncomfortable reminder to many Americans of their continuing dependence on Arab oil, the collapse of oil prices in 1986 seemed to complete the rout of the doom-sayers: the energy crisis was a 1970s aberration that could be forgotten. The once-invincible Organisation of Petroleum Exporting Countries (OPEC) lost oil

sales in 1986 for the seventh year running. Sheikh Yamani has been sacked. The average US price fell to \$15 a barrel and the spot price dipped below \$10. Many western energy industries, especially coal mining and oil-refining, faced serious problems of over-capacity.

In the 1980s other crises seized public concern, most notably the catastrophic famine that hit Africa in 1984/5. Energy crisis was replaced by food crisis. Yet compartmentalisation of such problems has become increasingly difficult. The World Commission on Environment and Development, chaired by Norway's Prime Minister, Gro Brundtland, produced a much-publicized report in 1987 that stressed the interdependence of various critical problems; 'these are not separate crises: an environmental crisis, a development crisis, an energy crisis. They are all one.' The idea of a 'world in crisis' had in fact already been taken up by human geographers: 'a number of reports was issued proclaiming one crisis after another, and it was but a short step to put them together and identify a general or global crisis' (JOHNSTON and TAYLOR, 1986). JOHNSTON and TAYLOR's particular vision was inspired by the holistic world-systems approach of Immanuel WALLERSTEIN, who viewed the current set of problems as but part of the long-term crisis - or terminal illness - of capitalism.

The Brundtland report not only stressed global interdependence, but also the impossibility of separating economic development and environmental issues: 'ecology and economy are becoming ever more interwoven - locally, regionally, nationally and globally - into a seamless net of causes and effects' (World Commission, 1987). The energy crisis according to this view is also the environmental crisis; sustainable global development (a key phrase) demands a use of energy that is within the planet's ecological means. To bring developing countries' energy use up to industrialized countries' levels by 2025 would require an increase from present levels of global energy use by a factor of 5; 'the planetary ecosystem could not stand this, especially if the increases were based on non-renewable fossil fuels.' In this conception the energy crisis is thus as much about acidification of

the environment, the 'greenhouse' effect of carbon dioxide accumulation, and radioactive fallout and waste disposal, as it is about fossil-fuel depletion and prices at the petrol-pump. Moreover Chernobyl reinforced the sense of global interdependence, dispelling any lingering notion that individual nations can act alone to protect environment; in the words of the protesters, 'Chernobyl is everywhere.'

If we return to the narrower notion of an energy crisis as manifest in the oil price shocks of 1973-4 and 1979-80, economists see these as symptoms of an underlying economic change. Middle Eastern conflict, and action by a small group of producer states, 'contrived' an oil crisis in 1973, but many take the view that the USA and several other western countries would have faced an equally disruptive crisis sooner or later, because the growth of world oil demand had begun to exceed the growth of world oil production and reserves. Economic and social progress depends on technological advance; where change has become slow while population (and demand) has grown, then energy shortages occur, erupting sometimes into crisis. LeBEL (1982) argues that such crises are recurrent or periodic - thus a serious and prolonged crisis in seventeenth century England (associated with population growth and fuelwood depletion) was only dispelled when the energy base shifted to coal. Hence the common interpretation that the energy crisis of the 1970s demanded a 'transition' to a different type of energy future. In this transition technical change will play a crucial role. However LeBEL concedes that recent energy crises are distinguished from those of the past by the complexity of modern energy supply systems and decisions.

ODELL (1986) has argued that the period between 1950 and 1970 was exceptional in the West. The high rates of industrialization and urbanization were based upon a system of production, transport and consumption, that was unnecessarily energy-intensive. The real price of energy declined; public perception of energy as a cheap input was the hallmark of technological and behavioural aspects to economic and social

development. ODELL considered reaction inevitable once the real price of energy began to rise - which it did from 1970. Society became much less energy-careless; there was a dramatic decline in energy-intensity in western industrialized nations; the rate of increase of energy use slipped back to its historic level of 2% p.a. ODELL and others are thus sceptical about the idea of energy crisis, a concept 'seldom seriously appraised' (REES and ODELL, 1987). Moreover physical resource scarcity is seen as a false issue (REES, 1985); the world is not running out of resources. However this optimistic school may under-estimate the impact of diffusion of energy-intensive practices to developing countries with consequent growth of global energy demand. Moreover, as BYRNE, MARTINEZ and RICH (1985) point out, the post-industrial society in the west entails a commitment to the development of *electricity* as the dominant energy source of the future. This may require heavy use of coal and nuclear power to provide stable supplies of fuel for electricity generation - with serious environmental implications.

We may concede that in the last decade the word *crisis* has been considerably abused. *Sensu strictu*, crisis implies something more than a problem. It means time of acute difficulty, and in the original Greek, *decision* (JOHNSTONE and TAYLOR, 1986) - critical juncture in a process when a decision must be made. Crises represent *turning-points*, and therefore *opportunities* - they thus have both negative and positive characteristics (MYERS, 1985). Hence the belief, in an *energy* context, that they can mark the beginning of a *transition*. Decisions are necessary for this to be achieved. If the opportunity is not taken, the problem can be deepened into disaster.

If, as argued earlier, we are faced in the 1980s with 'one crisis', it is nevertheless possible to identify components with a strong energy supply dimension. These include

The fossil crisis: this erupted in the 1970s with the oil price shocks. Depletion of oil now seems a less urgent problem, and a surplus of coal and oil has emerged on world

markets. However a complex set of problems with an environmental dimension have emerged, relating specifically to the impact of large-scale fossil-fuel burn upon the global environment. The shift from relatively scarce oil to more abundant coal exacerbates this problem. Other problems associated with fossil-fuels relate to the economic and social consequences for producer regions of restructuring and technological change. This applies especially to coalfield communities in Western Europe, and was dramatically illustrated by the mineworkers' strike of 1984-5, which produced a political crisis in the UK.

The fuelwood crisis: in much of the world the real energy crisis is the shortage of firewood. For the inhabitants of many Third World countries this is not a problem of adjustment (like the oil crisis in the west), but a problem of survival. Fuelwood scarcities now affect at least 1.3 million people; overharvesting for cooking, heating and other basic needs is driven by population growth. The immediate problems for the rural poor are compounded by environmental deterioration associated with forest destruction. The fuelwood crisis is a real resource issue (REES, 1985). Fuelwood crisis is linked to oil crisis.

The nuclear power crisis: the disaster at Chernobyl in April 1986 provided a glimpse into the abyss. Its impact was international both through its effect upon public attitudes and its diffusion of radioactive contamination. However the nuclear power industry was in serious trouble in many countries before Chernobyl. In the USA the economics of nuclear power had begun to look decreasingly attractive in the late 1970s: no new nuclear plants have been ordered in the USA since 1978 and numerous projects have been cancelled. The Three-Mile Island accident in 1979 diminished public confidence and confirmed the trend. Although in the UK the government remains firmly committed to nuclear power (and recently granted approval for the Sizewell B power station), a 'moment of transition' is identified by BLOWERS and PEPPER (1987) in the early 1980s, when the nuclear issue moved from consensus to conflict. A series of events (many connected with

the Sellafield reprocessing plant) concentrated public attention on the industry.

WHAT PUBLIC POLICY ?

The energy crises described above are so wide in their range and so complex, and so intertwined with economic, social and environmental problems that intervention in the public interest is inevitable, even if the nature and direction of that intervention is often controversial. Energy policies of a kind had existed for many years in countries like the UK, but not in a form capable of responding to the shocks of the 1970s. In the USA, according to HOUSE (1983), energy crises have produced the most confusing set of policy problems - 'disagreement or ignorance on the facts, uncertainty on the potential results of many suggested policies; an awareness of painful choices between short- and long-term policies; ...no clear concensus on national energy goals.' Normally policy changes tend to be incremental in nature; crises require fresh policies and lifting of the problem up the policy agenda.

The crises of the 1970s were unusual in their impact in that in many countries they led to attempts by government to formulate policy for the energy sector as a whole. This positive approach was exemplified in the USA by Nixon's wildly ambitious Project Independence and Carter's National Energy Plan of 1977, or in the UK by the Green Paper of 1978. These set out a strategy for all energy sectors. However in the 1980s in both countries there has been an attempt to reduce the level of intervention, and to leave energy to market forces. President Reagan has introduced a fundamental discontinuity into national resource and environmental policies; deregulation, defunding and defederalization have been the new targets. The Thatcher government in the UK 'judge that the most important contribution they can make at the present time is through removing obstacles to the free operation of market forces' (Department of Energy etc., 1983).

With or without some overarching strategy, governments on both sides of the Atlantic inevitably affect the development of energy industries in a variety of ways; the absence of a positive or explicit energy policy means that in practice the policy is determined by default. In the UK state ownership and financing of industries like coal and electricity since 1945 give government an obvious control, but even where state industries are absent, as in the USA, there are other channels of influence, including the ownership of federal lands (especially in the West), energy research and development, price regulation, licensing of technology, environmental and safety legislation. The policy-delivery process is complex, with a multiplicity of agencies involved. There may however be a risk of over-valuing what public intervention can achieve, given the power of market forces, and the pluralistic nature of the political system (at least in the USA).

The answer to the question 'what public policy?' is thus difficult to answer precisely. Given the fundamental importance of energy to the operation of the economy, the perceived energy shortage of the 1970s was clearly a public policy question, but no simple answer can be presented. Whether or not a strategy towards energy as a whole is an agreed objective, governments are bound to adopt policies towards individual energy sectors, in relation to their impact upon economy, society and environment.

WHAT, NO ENERGY GEOGRAPHY?

How has geography reacted to the energy crises and to public policy issue? The oil shocks of 1973-4 produced a major growth of interest in energy studies in the social sciences. PASQUALETTI (1986) considered that there had been nothing to match this rapid increase in interest in any other topic. However geographers were slow to mount the bandwagon. HOARE's count in 1979 of the research interests of British geographers revealed 'an almost total absence of interest in energy'. In 1983 FERNIE counted less than 30 human geographers with a declared interest in energy; the Institute of British Geo-

graphers has seventeen study groups but not one devoted to energy. In the USA the situation is marginally better, and the Association of American Geographers has an Energy Speciality Group. The activities of this group led to a survey of 'Geographical Dimensions of Energy' (CALZONETTI and SOLOMON, 1985), by over 25 contributors from both sides of the Atlantic, on a diffuse set of topics. Each major sector of energy production (e.g. coal, oil, natural gas) tends to maintain a baseline of a small number of scholars, with occasional increases in activity on a particular topic when this has moved into the public eye (as nuclear power has in the 1980s).

'Energy geography' (if it exists) thus has a long way to go before it can match the stature of many other branches of the discipline. (The presence of 2 British energy geographers at this seminar bears no relation to their frequency in the IBG membership). The authoritative Dictionary of Human Geography (JOHNSTON, 1981) ignores it, there are no entries under 'energy' or 'resources'. The more personal, idiosyncratic account by GOULD (1985) notes the way in which geographical expertise is 'illuminating problem after problem over a wide spectrum of concern' yet is devoid of reference to oil crisis or nuclear power (though it does manage Call Girls, Beltway Bandits and Henry the Navigator).

According to a survey by DANIELS, SALT and WERRITTY (1987) for the IBG, British geography today has seven major research foci: i) welfare issues, ii) the urban fringe, iii) reconstruction of paleoenvironments, iv) atmospheric and hydrological processes, v) restructuring of the British economy and its impact, vi) the role of institutions as initiators of change, and vii) resource assessment and management. Energy studies do not merit separate grouping, though some are subsumed in the last three categories and especially, vii) 'resource management', which here is seen mainly as the province of the physical geographers. Conflicts over resource issues (including siting) and analysis of hazards (including those from nuclear installations) are included in this group.

A major theme in geographical debate in the 1970s was the desire for relevance - the wish of many in the profession to see geographers contributing to the understanding and solution of major problems facing society. This being so, why have geographers been so inconspicuous in the energy field? In the 1960s the study of energy had traditionally been undertaken as a subdivision of economic geography; MANNERS' excellent book is the best developed example of this approach. But workers like MANNERS and ODELL were relatively isolated figures in this field in the 1960s. And appraisal of natural resource development had virtually vanished from the research agenda (REES, 1987).

One reason lay in the methodological developments of the 1960s. The new pre-occupation with model-building and the formulation of theory on the featureless isotropic plain diverted geographers from resource-based activities. The physical base was 'assumed away'. The locational problem presented by extractive industries was superficially too simple in the era of sophisticated spatial analysis. Moreover geography became pre-occupied with research problems that could be approached on a restricted spatial scale: international dimensions were largely ignored, and geopolitics remained disreputable. There was no conceptual framework to cope with global forces. In 1973-4 geography was ill-equipped to respond to the oil crisis.

There are other reasons for geography's slow adoption of energy studies. One may be the way that energy is developed and administered in advanced societies, especially the UK. The dominance of large-scale (often state) organizations deflates interest, and makes access to decision-makers difficult. Location decisions are infrequent and investment projects long-term and capital-intensive. Their impact may be limited because products tend to be highly mobile and plug into existing distribution systems rather than generating substantial local spin-offs (HOARE, 1979). The spatial element in decisions is frequently subordinated to other social, economic and political influences. Thus OPENSHAW (1986) has recently conducted a sophisticated analysis of the geography

of nuclear reactor siting in the UK, but his prescriptions are likely to be ignored. O'RIORDAN (1987) argues that 'the main problem...is not that he (OPENSHAW) is wrong but that the politics and economics of UK nuclear facility decisions fly in the face of his analysis and recommendations'. Part of OPENSHAW's problem he himself explained in a previous study - 'the Central Electricity Generating Board simply refuse to provide any details of their siting policies' (OPENSHAW, 1982). This additional problem of secrecy and withholding of information is especially marked in the nationalised industries and government departments of the UK.

The 'openness' of the decision-making process to view has however increased in the 1980s, and this may encourage more geographers to enter the energy field. Two developments have been significant. Three major public planning inquiries into the siting of energy facilities (Sellafield, Vale of Belvoir, and Sizewell) have embraced a wide range of factors and led to intense scrutiny and public cross-examination of evidence from government departments and state industries. Secondly, since 1979 the House of Commons Select Committee on Energy has reinforced this process. The Committee has considerable power to send for persons, papers and records. Its reports and published minutes are rich sources of information. Its special advisers may have considerable influence in agenda-setting. It is noteworthy that in recent years the Select Committee has been advised by the economic geographer, Gerald MANNERS, an advocate of the free market approach to energy development, and opponent of the expansionary plans of the coal industry in the 1970s (MANNERS, 1981).

Despite the paucity of energy geographers on the ground, it is possible to identify a number of areas in which geographers have shown an interest and begun to contribute to the public-policy debate. Those listed below refer specifically to geographers working in the UK and USA and relate almost exclusively to those countries. Regretably, few geographers have shown much interest in Third World energy problems.

The energy market: this focuses upon an economic geographical analysis of supply/demand relationships, and fore-

casting, often for particular energy industries. The best known exponent of this approach is MANNERS (1981) with respect to coal. However in this work it is difficult to identify anything distinctively geographical, for example the UK market is examined largely as a single unit, rather than in its regional dimensions. MANNERS' approach is not dissimilar to that of economies like ROBINSON and MARSHALL (1981) working in the same field. This group also includes studies like those by ODELL and ROSING (1980) who have attempted to forecast the potential of North Sea oilfields using simulation methods.

The geopolitics of energy production and international trade in energy: this is a longstanding interest of ODELL and has recently been taken up by REES (1987), who argues that spatial differentiation and geopolitics are vital components in the explanation of events in the international oil industry: 'geography is not merely an outcome, but is part of the explanation of the oil development process'. The growth of the world-systems approach in geography may produce some further developments in this category.

The siting of energy facilities: this has its roots in the traditional emphasis in economic geography upon the explanation of location. The siting of large-scale power stations and of waste disposal facilities are two key problem areas of public policy, and geographers have become involved in both. CALZONETTI (1981) illustrates the problems of 'finding a place for energy', principally in relation to coal conversion facilities in the USA. In some respects energy facility siting may be seen as a special case of industrial location geography, using traditional tools and expertise. CALZONETTI notes however that an energy facility siting literature is evolving independently of location theory, because practitioners are often unable to transfer simplified theoretical contributions to problems so complex as power plant siting, which embrace economic, political, legal and environmental criteria.

There are two aspects of importance here. One is the explanation of existing sites, and the second is assisting in the process of selection for future sites. Few geographers

are likely to be in positions where they can participate in decision-making, though they may attempt to influence site choice. One important role that geographers are already playing in some American states is the construction of computerised geographical information systems as a basis for site selection. Geographers working in the State of Maryland's Department of Natural Resources developed an automated GIS as a basis for site suitability analysis for power plants and land-use screening techniques (DOBSON, 1979). In this particular example it can be noted that the selection of a site by this method still did not overcome problems of public opposition to what was perceived as a noxious facility (CALZONETTI, SAYRE and SPOONER, 1987).

In the UK the best-developed example of a siting study is OPENSHAW's analysis of potential nuclear power plant sites, which also draws upon a computerized information base (OPENSHAW, 1986).

The environmental impact of energy facilities: this type of study has received a major impetus from the introduction of environmental impact statements/analysis as an obligatory accompaniment of major project proposals in the USA since 1970, and more recently in the European Community. Geographers in the UK at the University of Aberdeen (CLARK et alia, 1976) have played a significant part in the evolution of methodologies and techniques in this field. Environmental impact encompasses effects upon the physical and socio-economic environments and can be considered at a variety of scales. The spatial and temporal pattern of impacts is of particular potential interest to geographers (CALZONETTI and SPOONER, 1984).

The role of energy in regional development: studies of the socio-economic impact of individual energy projects upon the localities in which they are situated, lead to broader consideration of their effect upon regional economies. Often in the past the predominant public policy issue has been the consequences of decline of major energy industries which have been spatially clustered, coalfield problems being the obvious example.

Geographers in the UK have continued to display an interest in the problems of energy-producing regions. In the USA there has been growing attention to the impact of energy growth and windfall income on regional patterns, though the lead here has come from regional economists (e.g. MIERNYK, 1976). Among geographers, CALZONETTI and HANHAM (1985) have pursued this theme as part of a multi-disciplinary research project into electricity exports from West Virginia. SPOONER (1981) has attempted to develop a generalized model of the relationship between mineral resource development (including energy) and the evolution of regional development patterns.

Risks, hazards and public attitudes: the problems of nuclear power especially have led to a growth interest in behavioural aspects of energy development and use: geographers in the USA including KASPERSON, PASQUALETTI and PIJAWKA have been actively involved in studies of the problems of managing this hazardous technology (see PASQUALETTI and PIJAWKA, 1984) and in the issues surrounding emergency planning and evacuation. MCGILL and PHIPPS (1987) provide a recent example of this genre in the UK.

Processes of policy-making and resource management: this final category in some ways subsumes the others. O'RIORDAN (1977) saw resource management as the process 'of determining the need for, and value of, utilizing resources in the context of environmental constraints, social implications, technological inventiveness and national policy guidelines'. This is a political and economic process that takes place in a context of administrative and institutional complexity. Energy policy, land-use planning and pollution control are all embraced. The skills of the geographer in synthesis may be of particular value in this demanding field, and are demonstrated in the work of O'RIORDAN (1984), FERNIE (1980), and SPOONER (1985).

BACK TO THE FUTURE

This paper has attempted to survey selectively some of the areas in which geographers in the USA and UK have reacted

to the energy crises of the last two decades, and attempted to expand their interests into public policy issues. Much of the work that has been carried out is empirical, lacks a clear relation to any theoretical base, and is characterised by unexamined value position, but this is true of human geography as a whole (FLOWERDEW, 1986). It appears that geographers are still struggling to establish a pitch in the rapidly crowding energy field.

Part of the problem is a question that has persistently faced human geographers for many years: which audience are they trying to address? Are they attempting to communicate with other geographers in the academic community, or with a wider attentive public waiting to be educated (including captive audiences in the classroom), or with policy-makers and decision-takers in public institutions? Those who wish to change the world as a long-term project might target the second group, but in the nearer view the focus of the discussion in this paper is the desire to communicate and interact with the policymakers.

British geographers are an introverted bunch, racked with inferiority complexes, and spend a disproportionate amount of time addressing each other. WILBANKS (1985) considered that this was also characteristic of American geographers working in the energy field: 'geographers writing about energy have been mainly concerned with reaching an audience of other geographers'. Publishing in traditional geographical journals serves this end. PASQUALETTI (1986) shows that articles about nuclear power in such journals are rarely cited outside the discipline. Geographers are often regrettably invisible within society at large - partly because geography (outside education) is not a profession and geography graduates lose their identity as they become planners, civil servants and managers. In the USA energy geographers working outside academia show more tendency to retain their links with academic geography (e.g. WILBANKS and other at the Oak Ridge National Laboratory of Federal Energy Regulatory Commission), but few hold key policy positions compared say to economists.

In the UK some geographers have begun to promote more active input into policy discussions, though few can claim influence on policy-making. MANNERS, whose work for the House of Commons Select Committee has already been cited, may be one exception. A small number of individuals have given evidence to such committees, including OPENSHAW (nuclear power plant siting), HUDSON (coalfield decline), BLOWERS (radio-active disposal), (as a politician rather than an academic) and O'RIORDAN (environmental issues). This suggests that some have begun to be recognized as 'experts'.

One problem that faces such geographers in their interaction with policy-makers is that they may approach the energy problem from a different ideological standpoint to those in power, or they may subscribe to different values. Energy-environment issues have resulted in polarisation between 'technocentric' and 'ecocentric' ideologies of resource use. Many geographers are 'green-tinted' and drawn towards an 'ecocentric' ideology emphasising the integrity of natural ecosystems, the economics of permanence, and a preference for low-impact technology, small-scale development and decentralization. LOVINS (1977) concept of the 'soft energy path' has particular appeal, with its emphasis upon conservation and small-scale dispersed renewable energy sources. But government in both the USA and the UK follows a technocentric 'hard energy path' exemplified by massive commitments to the nuclear industry, the ultimate 'technical fix'. The clash of values between many geographers and their technocentric masters is one of the most intractable problems facing the individual researcher.

Assuming that the problem of values can be surmounted, (or ignored?), geographers must establish their credibility as 'energy experts' if their influence is to grow. This is far from easy in a field where many problems may require an understanding of, for example, physics, ecology, economics, law, planning, politics.... Yet on the other hand who is better placed than the geographer to synthesise findings both natural and social science? Geographers may be in a unique position to utilize both their *specialist* (spatial

analysis, cartographic systems, etc) and *generalist* skills in the energy field. The specialist skills may be those of either *physical* or *human* geography.

Obviously energy problems are not the exclusive province of the geographer. But it is equally true that they should not be regarded as the exclusive terrain of the economist. The discipline of economics provides the most complete and elegant theory addressing the problem of how society deals with the problem of scarcity, but nevertheless remains inadequate in dealing with a number of energy and environment issues (HOPE and OWENS, 1986). The conditions of perfect competition rarely exist, and the values of the market place are challenged. Insights from environmental science, political science, psychology, etc. may be vital in addressing many problems concerned with for example conservation of energy, the closure of coalmines, nuclear power.

Geographers may play a particularly valuable role in multi-disciplinary studies of energy issues through their particular *perspective*, with its triple emphasis upon man-environment relations, spatial variation and regional synthesis. The re-growth in the last decade of the man-environment relationship as a strand unifying physical and human geography is particularly relevant in the energy field, where energy-environment interactions seem destined to play a central role in public policy problems in the closing years of the twentieth century.

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POWER AND PEOPLE:
PUBLIC PARTICIPATION AND ENERGY POLICY

A. HOARE

INTRODUCTION

The day this paper was first drafted the United Kingdom government took a much-publicised decision, superficially encouraging for those believing that the public should both take a firm interest in national energy policy, and that their views should be heeded.

The so-called 'Nirex' case concluded with a *volte-face* by the British Government over its previously-expressed desire to find a burial site for 'low level' waste from the nation's nuclear power stations. At each of the 4 villages short-listed as 'preferred sites' the predicable, fierce look-alike protest movements had been mounted, membered by those living atop the ultra-stable geological structures so attractive as nuclear dumps. On May Day, 1987, the power of the people triumphed: the Government (through the Secretary of State for the Environment) announced the whole concept of low-level waste dumps had been abandoned, Champagne corks popped in four happy English villages as the television cameras whirred. On the face of it, a triumph for intense public involvement in a controversial facet of a controversial energy source (and hailed as such by the Chairman of the prospecting company - Nirex, *The Times* 2nd May, 1987). And one might have expected a government frequently taunted with the label 'un-

caring' to have taken this line publicly. But in practice the official explanation was rather that a dramatic recalculation by Nirex had effectively removed the economic case for this form of nuclear waste disposal. Its political opponents adopted a different tack, arguing that the remarkably speedy Ministerial decision (the Nirex recalculation reached the Minister only the day before his decision) certainly bore the imprint of a sensitivity to public hostility, but its timing and placing were crucial. All four villages were in constituencies held by supporters of the Thatcher Government (three of them by Ministers), in all four feeling was running very high against the dumping prospect, and everyone believed (correctly) the next General Election was just round the next corner.

Interpreting the potency of public opinion in this sort of 'one off' case comes down to who you are prepared to believe. You pay your money.... The rest of this paper considers the two basic ingredients of the Nirex example - public participation (pp) and energy policy - first separately, then in unison and finally through two case studies whereby their geographical interest can be illustrated.

PUBLIC PARTICIPATION AND ENERGY POLICY

Far less open to doubt than the interpretation of cases like Nirex is that both public participation in policy issues, and energy policy and planning, have assumed higher profiles in Britain as in several other countries in the last two decades. And for the latter we can date this upward trend almost to the day. The fears and realities of OPEC's raising world energy prices in autumn 1973 sent shudders throughout the many advanced economies who had become steadily more energy intensive in their commercial and household activities (often profligately so), and within their energy budgets had become increasingly wedded to oil as a clean, mobile and flexible fuel. Until 1973 energy had attracted relatively little interest as a field either of public policy or of academic scholarship. Neither remains so any more. Govern-

ments have instituted energy policies and energy ministries out of next-to-nothing, everyone's previously favourite energy source (oil) now carries a clear price tag, and a high political risk over availability. Policy makers have found there are alternative ways to plan for future energy needs other than merely extending past trend lines. Energy supply and demand are disaggregated into their component parts, and reassembled in various ways, generating a package of possible 'futures' open to public comment. Equally, academic publications on energy have risen dramatically, albeit from a very low base (HOARE, 1979). And within Geography, the formerly Cinderella field of energy geography has at least received its ticket to the ball, if not the glass slipper: the British-Hungarian seminars are typical of the trend - no 'energy' papers in 1976 or in 1980, but three in 1984, and three more this time.

Public participation has, by contrast, received a number of pushes at different times in different places, rather than one multi-national heave. In Britain, for example, the Town Planning Act of 1968 made it obligatory for statutory planning authorities to consult their publics formally over planning proposals, and show evidence that these consultations had been given due weight in the end-strategies. But with or without such legalistic stimuli, *some* PP ingredient is seen by many as one of those 'Motherhood' issues with which it is impossible to disagree in principle.

The problems come with the practice. First, the overall level of commitment to PP in a political system can vary from what ARNSTEIN's (1969) seminal typology labels as 'degrees of nonparticipation' at one extreme, through 'tokenism' - paying lip-service to PP but giving it no effective role - to varying levels of 'citizen power' at the other. Average 'rung' positions on her ladder of PP are likely not only to vary from country to country, but within any one nation may differ between policy fields, some allowing and encouraging more public input than the others. The same holds within any policy realm over time, as ROBERTSON's (1979) suggested plotting of major environmental measures of the New Zealand government (*Fig. 1*) demonstrates.

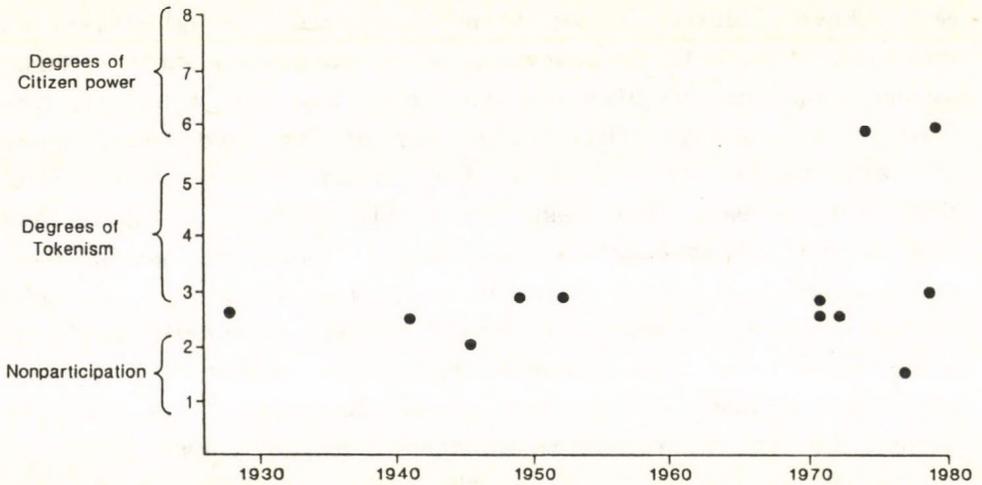


Fig. 1 New Zealand environmental legislation on Arnstein's ladder

Whatever the prevailing general 'level' of PP commitment in a political system, a series of operational questions arise in implementing any such underlying philosophical stance:

1. *What issues are appropriate candidates for PP?* - some constraints have to be placed on those where a public view is sought to keep the whole exercise within manageable bounds, and because some issues involve security or otherwise sensitive aspects, but the ground-rules as to where to draw the line are obscure. Why was Northern Ireland offered a referendum on continued union with Britain in the 1970s but not on the Anglo-Irish Agreement in the 1980s? Why has Britain had a referendum on one non-party issue - joining the Common Market - but not on another - capital punishment - on which public feeling is at least as intense?

2. *When is PP appropriate?* - at the initial, first-thoughts stage, when a short-list of preferred options is being defined, or in response to a definitive proposal which, while sufficiently precise to generate strong public feelings, has already worked up such momentum as to be difficult to deflect? Or somewhere in between?

3. *How* should PP be marshalled? The very great variety of options selected by Britain's planning authorities to comply with their legal obligations under the 1968 Act (HAMPTON, 1977; BOADEN *et al.*, 1980) evinces both that a multitude of routes may be found to a particular PP goal, and that none may be self-evidently much better than many others. Broadly speaking, such strategies can be divided into the 'active' and the 'passive'. In the first, public opinion is actively sought by responsible authority, as through a door-to-door survey, while in the second the onus is on the public to contact the authority with its views (by returning a questionnaire, writing letters and so on). The second runs the risk of being unrepresentative, through both the 'orchestrated campaign' problem and that those opposed to a proposal are more inclined to represent their views than its supporters, but the first might give equal weighting to those who neither know nor care about an issue and to those feeling passionately about it.

4. *Where* should public opinion be sought? For a national issue (like hanging) this is not a problem, but many issues are geographically specific - the projected expansion of a local dairy, the establishment of an AIDS clinic, a major airport or a PWR reactor. The responsible authority has to decide where (if anywhere) public views should be explicitly solicited (who should the planners inform about the dairy's planning application?) and how, if at all, to weight the views of those close to the facility against those further away, a problem exacerbated by likely differences in their reaction to its desirability (the locals probably being more anti the clinic and more pro the reactor than those further afield).

PUBLIC PARTICIPATION IN ENERGY POLICY

All these are general difficulties with public participation, and as such crop up in a wide range of different policy experiences (see SEWELL and COPPOCK, 1977). What of the specific case where our interests in PP and in energy policy inter-

sect? While experience varies internationally, the general impression is that, despite some halting upward steps, energy occupies a fairly low rung on ARNSTEIN's ladder.

In BARKER's (1979) comprehensive bibliography of the PP literature, for example, only 4 of 376 entries are concerned with energy examples (all nuclear). Certainly, in comparison with many other policy fields that of energy finds the public at large short of both the need and potential to be involved, from both their own perspective and that of energy suppliers. In most advanced societies, energy supply is the business of highly centralised, frequently state-run utilities, unaccustomed to close, first-hand contact with the bulk of their customers and operating from a monopoly dominance within their own energy sector. That energy investments are both impressive in scale and taken against a complex backcloth of international politics and sophisticated technological inputs can bestow an aura of unchallenged and unchallengable omniscience on the part of the providers of energy supply. Few of them may have been as prepared to be quite as blatant as the French minister who remarked on the (non)involvement of national public opinion in its nuclear programme that 'you don't consult the frogs when draining the marsh', but his sentiments would find many sympathisers in energy supply utilities.

Consumers, too, acquiesce in this non-involvement. Deterred from entering the fray by the scale and complexity of energy investments, accustomed to taking energy supply for granted until the hiccups in the 1970s, they are also conditioned to a lack of choice in energy affairs. We don't expect to pick and choose what source of electricity powers the washing-machine or the food-mixer while we do select the types and geographical sources of the clothes in the first and the vegetables in the second. Furthermore, the large scale economies inherent in energy investments mean that 'the few' (sites) can serve 'the many' (customers) so that most energy consumers have no direct experience of living near an energy facility, or being involved in its planning battles. That many of energy's environmental impacts are invisible, in-

audible and still controversial (e.g. leukaemia clusters, health hazards from transmission wires, acid rain) may exacerbate the problems of the committed in mobilising public opinion as compared, say, to the more obvious threatened impacts of a proposed airport, an urban motorway, mining in National Parks or a gypsy encampment.

The precise ways in which PP can be evident in energy policy are very diverse, even where, as here, we confine our attention to its role in policy *formulation* (LAUBER, 1982). (Some commentaries on PP in energy also consider it in the context of policy *implementation*, as through individual and household responsiveness to 'switch fuel' and 'save energy' campaigns). It may come through formal intermediary bodies for collecting and channelling public views to energy authorities (as with New Zealand's Energy Advisory Committee, established in 1980, which we shall meet again later), it may be manifest in a degree of local-scale public ownership in energy utilities (more common in North America than in Europe), energy policy might become a key discriminant in the policies of parties at a General Election (though examples do not come readily to mind!), it might come through an impressive, wide-ranging, multi-stage soliciting of public opinion on energy, as in the interesting butch 'BMD' experiment (TURNEY and SCHWARZ, 1983; JANSSEN, 1984). But its track record suggests that PP can be most effective through three other routes than these:

1. *Public protest* (with or without action through the courts). By the nature of things, this arises in opposition to some source-, and usually site-, specific energy 'initiative'. Success is far from guaranteed, but can be achieved if the political timing is right, as with the 'Save Manapouri' campaign in New Zealand (WILSON, 1982) and the anti Gordon-below-Franklin protest in Tasmania, both arising at election-time nationally. Alternatively, the newly returned Bourassa government in Quebec Province (in 1971) found in the massive Baie James HEP scheme in the Canadian Shield just the prestige

project to launch the new administration, after a particularly torrid recent political history, public protests from beyond the Province notwithstanding (RICHARDSON, 1972).

2. *Public inquiries.* Formal, often quasi-judicial, proceedings do allow the opportunity for 'all sides to be heard', subject to their Chairman's discretion and to gross inequality in the funds available to the protagonists. Although often depicted as public protest groups embattled against a giant energy utility or corporate applicant, this may downplay some local support for the energy project under attack (as may also arise in 1, from the less articulate working-class local population more impressed by the promise of jobs than the nebulous arguments of well-heeled protesters from further afield. Again, success mixes with failure (the Berger Commission of Inquiry into the Canadian Arctic pipeline (BERGER, 1977) on the one hand, and the UK's PARKER (1978) and LAYFIELD (1986) inquiries into nuclear installation applications on the other being respective examples). OWENS (1985) provides a detailed perspective of this PP option, from the British experience with power station planning.

3. *Referenda.* The best known of the energy polls of national opinion concern the nuclear option, and whether it should be done without. Austria, by the narrowest of votes, said it should in 1978, Sweden went half way in 1980, and 1987 was to show what the Italians wanted. (At the time of writing, the fate of their intended summer-1987 referenda still seems prey to the country's general political instability.) While on the face of it offering the strongest route for PP to be expressed and acted upon (it is difficult for an emphatic result to be ignored by the incumbent government), it has to borne in mind that such referenda are rare birds. They only occur at all because governments are prepared to tailor energy policy to their outcomes, finding any problems this raises outweighed by the political mileage in 'taking the issue to the people', sometimes also finding this a convenient way to enhance the government's political survival (as in the Swedish case: LAUBER, 1982).

Two examples conclude this paper, which fall easily into none of the categories of PP identified so far. The intention of these case studies is to show, albeit in summary form, how in their very different ways they offer opportunities for geographical investigation of PP in energy policy formulation.

INTERNATIONAL PREFERENCES: THE ESSO SURVEY

Esso Europe Inc. embarked on an extensive questionnaire survey in 1981 of attitudes to energy in general, and to oil companies in particular, conducted simultaneously in 7 Western European countries. While the nub of the survey from Esso's perspective was the image held of itself and its major competitors, some preliminary, almost 'warm up' questions asked respondents' views on current, likely future and preferred future energy sources used by their national economies.

The survey itself involved a stratified sample (in part based on national sub-regions) of some 1000 respondents in each country, its detailed specifications and implementation being described in detail elsewhere (Esso Europe Inc., 1981). We shall concentrate here on the responses received to the question:

'if it was left to you to decide, which one of these (energy sources) would you prefer to be most used in the year 2000?'

This was accompanied by a prompt card with 7 energy sources, in order as follows:

- coal
- gas
- oil
- nuclear power
- hydro-electricity/dams
- solar power

other renewable energy (e.g. wind power/tides/waves)
(don't know)

As can be seen, no constraints were placed on the 'first preference' choice. The geographical interest in the survey comes in in its providing, for the first time (to the writer's knowledge) cross-national data on a directly comparable basis of consumers' unrestricted choice of their ideal future energy economy.

Here we exemplify this interest in summary form, and in terms of three questions:

1. Do preferred energy profiles vary that much internationally?
2. Do these bear any resemblance to the likely form of future energy profiles? and
3. Are respondents still more likely to be satisfied by their own 'national' future than one of another Western European nation?

1. Preferred energy futures

As summarised in *Fig. 2.* these do indeed vary among the seven countries. Four different sources are the most popular in at least one country, often where they are already well established - coal in Britain, HEP in Norway, for example. Oil is universally unpopular (bear in mind the survey took place just two years after the Iranian oil crisis) while solar power tops the poll in all but three countries, and in a way broadly matching the potential for solar energy use among the countries on climatological grounds. That said, one in-house Esso commentary on this finding dismisses the solar response as 'unrealistic yearning' (SARGOOD and LOWE-WATSON, 1983).

2. The match between preference and reality

Certainly, solar power figures in none of the more sober official and unofficial academic projections of national

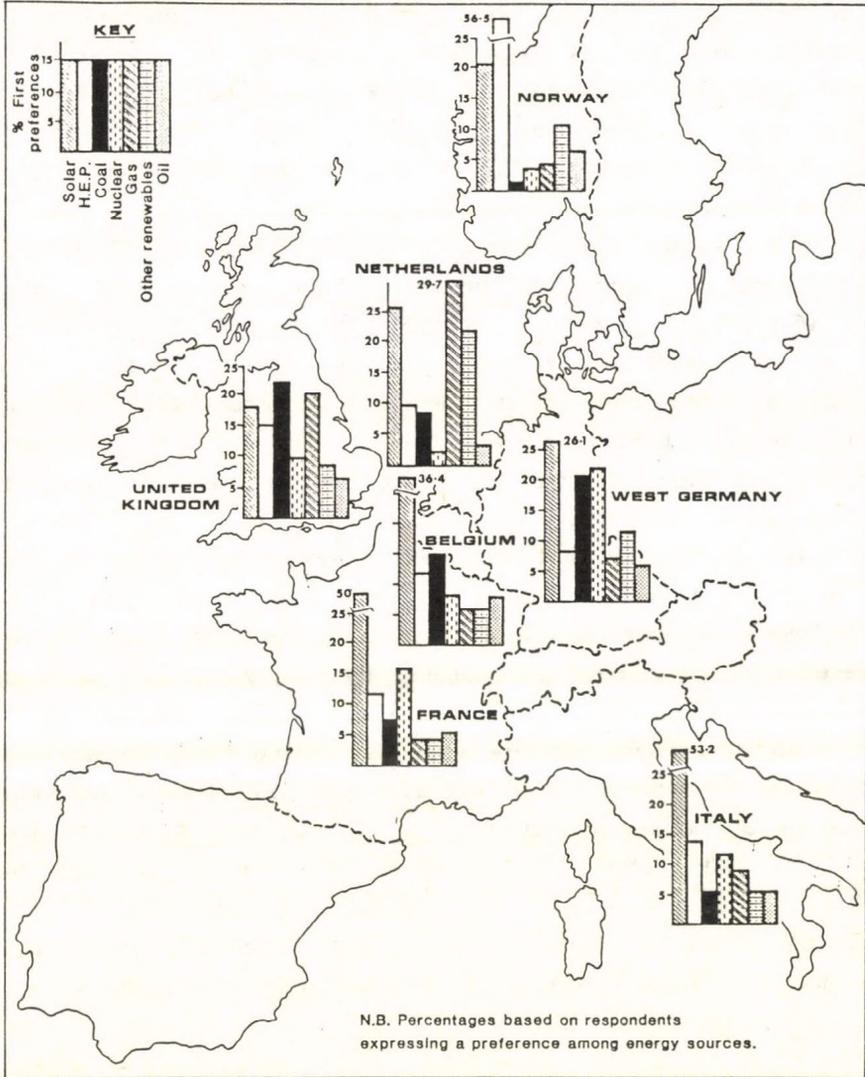


Fig. 2 Preferred energies in 2000 AD

energy use for 2000 in these same countries. So to compare 'preference' with this likely 'future' there is something to be said, on pragmatic grounds, for discontinuing the solar choice (and the 'other renewables', on a similar basis) and reworking the preferred 2000 profile simply for conventional responses. If we compare the results with the energy futures

foreseen by the latest International Energy Agency reports (IEA, 1985) the 'fit' between the 2000 energy source profiles for preferences and futures can be determined, via the Gini coefficient (see NOTE 1), for 6 of the Esso countries. For France, a non-IEA member, HEDLEY's (1981) projections are used instead. All these futuristic estimates are on a standardised, 'fuel equivalent', basis.

Table 1 shows the degree of 'fit' between preferences and futures, in terms of the percentage of national respondents who would have to change their first preference to make the two profiles match perfectly. Clearly, the smaller this percentage, the closer the fit. For comparison purposes the fit between preference and the reality of 1981 (the survey year) is also shown, from which it emerges that in all countries but one respondents are happier with 'their' national future for 2000 than with the one they experienced in 1981. The degree of dissatisfaction in the former ranges from France, where less than one in five would have to change their first preference for a perfect match, to Italy, with more than double this fraction. Delving a little more deeply, it appears that the major energy sources giving rise to dissatisfaction across the seven countries are oil (which everywhere is likely to be more dominant in 2000 than respondents would wish) and HEP, where the reverse universally holds, even in Norway. (In Belgium, for example, almost 20% of 'conventional' first preference is for HEP whereas the IEA estimate has its contribution of primary energy at 0.2%, on a fuel-equivalent basis!).

3. *There's no place like home?*

Even when the 'wishful thinking' options of renewables are discounted, some mismatch between preference and the likely future for 2000 is only to be expected. But if national policy strategies take some notice of consumer preferences, and/or if these preferences are albeit unconsciously constrained by the likely future path of the country's energy profile then we would expect the preferences of, say, British

Table 1 Preferences and reality in National energy profiles

	% respondents "dissatisfied"	
	by 1981 (reality)	by 2000 (best estimate)
France	39.3	19.6
Norway	29.7	23.1
U.K.	33.1	28.5
Belgium	34.4	28.9
West Germany	39.5	30.3
Netherlands	32.4	34.2
Italy	53.2	42.4

(For explanation, see text)

respondents to be closer to the 'Britain in 2000' future profile than to the likely futures of the other six countries. Does this happen in reality, or are there some respondents who would feel more in sympathy with an energy future other than their own country's?

Using the same technique as in 2 above, we can measure the 'fit' between the public preference for any country against the future of each of the 7 Esso countries. On balance, 'national' pairings (the French preference against the French future, for example) have a high fit compared to the 'international' ones (French preference against Belgian, Dutch... futures). Only four instances arise where national publics would be happier with another country's likely future and *Fig. 3* shows the population migrations this could generate if this were otherwise unconstrained. Three countries ex-

Conventionals

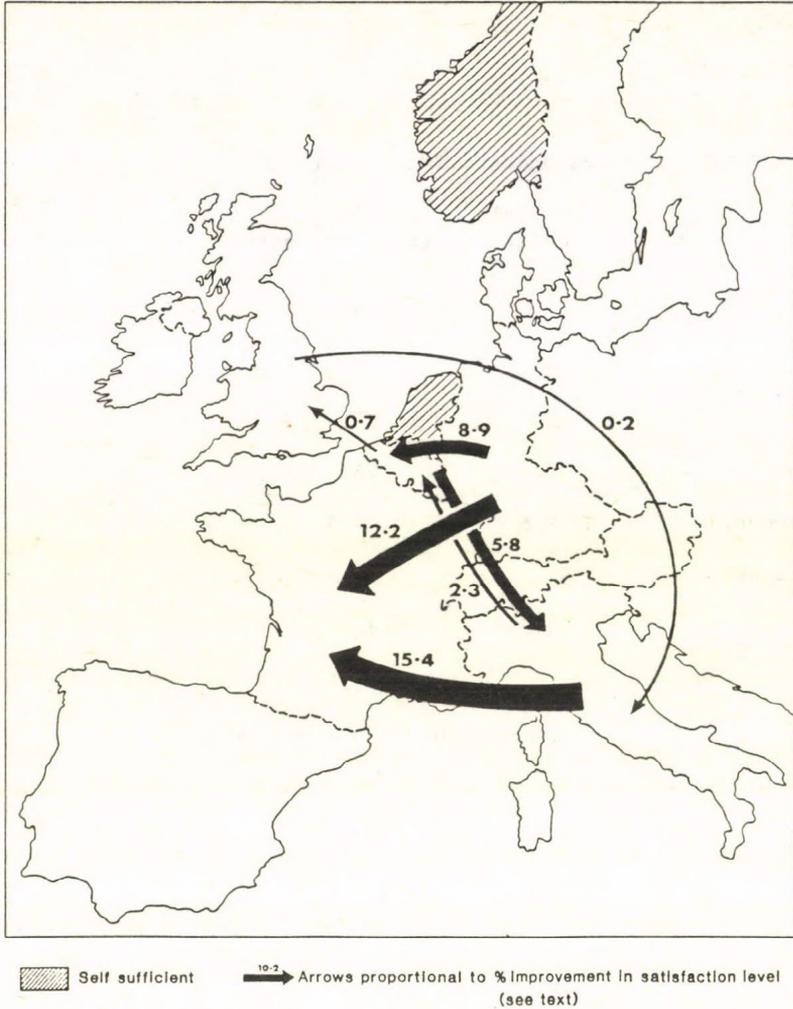


Fig.3. Energy-induced migration in Western Europe

perience both in and out-flows, the British being happier in Italy, for example, and the Belgians in Britain. Only France would have just an in-flow, its own nationals being more content at home than elsewhere, (despite being treated like frogs in the marsh?!), only West Germany has just an out-flow while the Netherlands and Norway are self-contained,

attracting nobody but keeping their nationals satisfied at the same time. The Belgian-Italian case is intriguing, in that some mutual exchange of population would be to both their benefits!

While not an entirely serious commentary on this aspect of the Esso results, underlying it is the more important conclusion. Bearing in mind that 42 such cross-national flows *could* have resulted in this way, the comparative paucity of arrows in *Fig. 3* suggests that national futures are relatively close approximations to the desires of their own energy consumers.

SPECIFIC USES FOR A SPECIFIC RESOURCE: THE MAUI CASE

The second example is very different, and to explain why requires a little historical background. Although blessed with abundant HEP resources, backed up by some coal and geothermal endowment, New Zealand has built an advanced economic system with, until about 1970, a precarious and complete dependence for transport fuels upon foreign supplies. Natural gas deposits had been known to exist in the Taranaki region of North Island (*Fig. 4*) for over a century, but the first significant well was only established, onshore at Kapuni, in 1959. Attention of the major participating companies (Shell, BP and Todd) then turned off-shore, and resulted in 1969 in the discovery of the Maui I well, at that time the third largest natural gas find in the world, and of profound significance for New Zealand's rethinking its energy strategy following the world oil shock of 4 years later. In fact, the agreement between the producer companies and the Government for the supply of gas over a 35 year period was signed just before the OPEC crisis, and under it the latter has to pay at a formula-agreed price for a contracted quantity of gas on a regular basis, whether this is used immediately or left in the ground (hence the so-called 'Take or Pay' agreement).

In practice, this valuable resource has been used partly for production of transport fuels for domestic use, in the

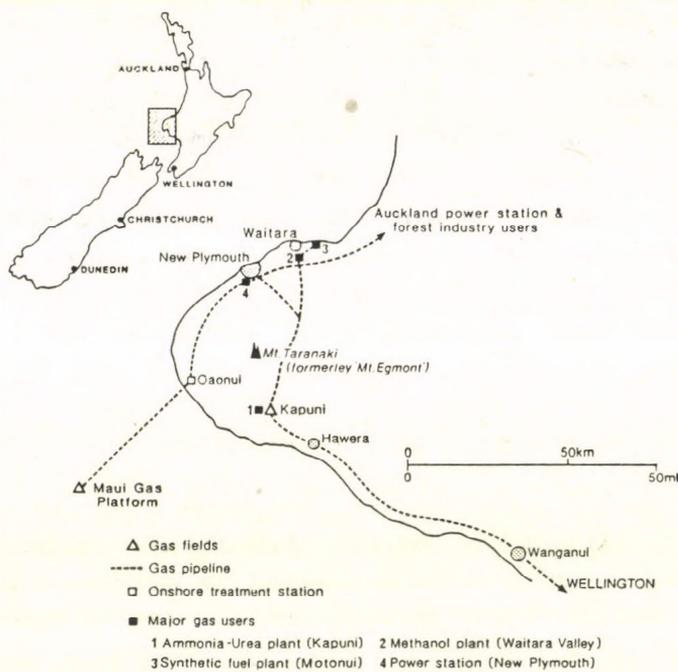


Fig. 4 Taranaki: 'Energy Province'

form of CNG (Compressed Natural Gas), distributed by pipeline widely in North Island, and LPG (Liquified Petroleum gas), transported by tanker, and particularly significant in South Island. It also enjoys more common-place usage as a power station input (locally at New Plymouth and Stratford, and beyond) and as a premium grade domestic and industrial fuel. However, following the inauguration of a highly-controversial package of energy-based projects in 1979, referred to collectively as 'Think Big', a number of other Maui gas uses were brought on stream, including three major investments in Taranaki, as shown on Fig. 4, the benefits of which both to the nation as a whole economically, and to the region environmentally, are hotly disputed (Environment Group Inc., 1981; NBR, 1984).

The latest phase in Maui use was inaugurated by the Government's decision to increase its 'take' level of gas under the supply contract which, by 1985, after 7 Take-or-Pay years, was running at only 66% of the volume it was required to pay for. On September 20th 1985 the Ministries of Energy (MOE) and the Environment announced that public comment would be sought on the preferred use of this increased and as yet uncommitted take. Its widely circulated and publicised Discussion Paper (Ministry of Energy, 1985) offered the public barely one month to consider three main proposals for the second tranche of Maui gas:

1. Use in electricity generation by the New Zealand Electricity Division (NZED) (the preferred option of the Ministry's own Oil and Gas Division, and hence a strong runner from the outset),

2. Production of Liquefied Natural Gas (LNG) for export (mostly to Japan), as advocated by New Zealand's largest private industrial corporation and

3. Leaving the gas in the ground: added by the Discussion document, in its own words 'to complete the framework for discussion'.

Public comment was to be channelled through the Energy Advisory Committee (EAC), an arm of the MOE one of whose remits is to gather and pass on such views on energy matters. Despite the short time allowed for comment on a complex issue (a constraint which itself attracted several unfavourable remarks in the public response) a total of 280 responses were received before the deadline (and 303 eventually).

From the geographical point of view, the Maui case is particularly interesting for two reasons. First, while not spelt out in any detail in the Discussion document, options 1 and 2 (hereafter 'NZED' and 'LNG' respectively) had clear local and regional implications as summarised in *Table 2*. The final 'lig' option had no additional such dimensions of its own.

Second, access to the actual public responses enables us to see how far the 'geography of the reaction' mirrored

Table 2 Sub-national Maui option implications indicated in 'Discussion Paper'

1) LNG

- a) LNG plant in Wanganui/Waitotara region
- b) Port for exporting LNG (to Japan?)
- c) 'Other infrastructural impacts'

2) NZED

- a) Maintaining full output of New Plymouth and Marsden Point Power Stations
- b) Reliable electricity supply in Auckland region
- c) Two-year deferrals at Luggate and Queensgate (South Island) HEP stations, and the next North Island thermal station (unspecified location)
- d).....For which Mokau coalfield could be considered as a possible source
- e) More orderly development of Waikato coalfield
- f) Huntly-to-Marsden Point gas pipeline, through Auckland isthmus

3) Lig

None

4) Independent of specific option

Construction of Maui B rig in Deep core (South Island)

this 'geography of the options'. More particularly, three questions can be asked:

1. Were responses more frequent from those regions directly affected by the Maui decision?
2. Did the preference for and against particular options reflect their spatial implications? and
3. Did respondents show any tendency to cite local/regional arguments in their submissions, so reflecting these same sub-national implications.

Space allows only the briefest of treatment of these questions which, as in Esso case, are developed more fully elsewhere.

1. The overall response pattern

Here, as later, we subdivide responses into those from individuals, those from 'groups' with an interest or remit less than the national territory (regional planning councils, local industrial concerns, trade groups, power utilities and the like) and those with a New Zealand-wide remit (the 'nationals' - such as branches of central government, and nation-wide corporations). Those in the last category are likely to be based in one of New Zealand's capitals - Auckland (the commercial one) or Wellington (the political centre), but the other two should, in the absence of any Maui-induced geographical bias, generate responses to the EAC broadly in proportion to the distribution of national population. But, as *Fig. 5* shows, comparing this (as of 1983 - the closest estimates available from the New Zealand Yearbooks) with the Maui responses reveals a dramatic over-representation of those from the 'Maui Coast' and, for 'group' submissions at least, from Northland (the two most 'impacted' sub-regions in the country), with an under-representation of views from the remainder of the North Island, as well as from the 'other' (South) Island.

On the face of it, this confirms the previous predicted impact on response geography very satisfactorily. Unfortunately, two compilations cannot be ruled out: first, it has been

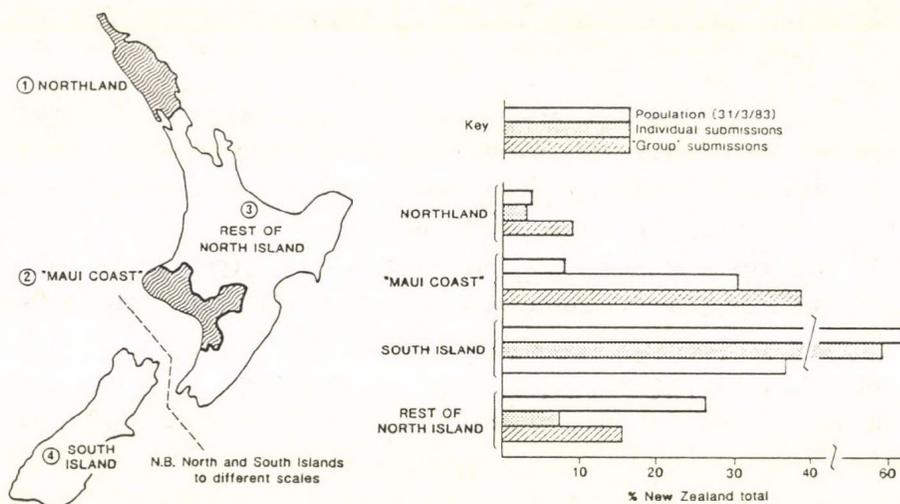


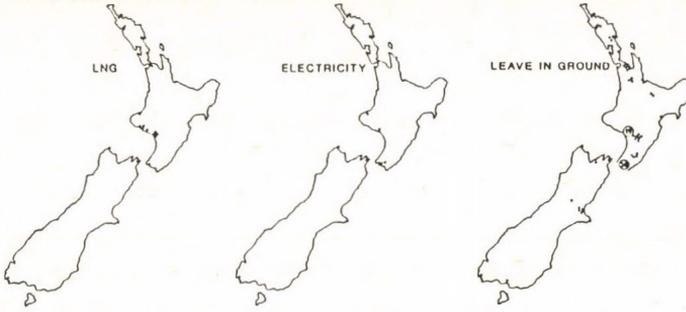
Fig. 5 The geography of Maui responses

alleged darkly that this geography was biased by orchestrated campaigns from some localities, and, second, the EAC itself wrote directly to institutions and groups suggesting they might care to make a submission. To the extent that this was selectively targetted on particular areas again our interpretation of *Fig. 5* may need be qualified.

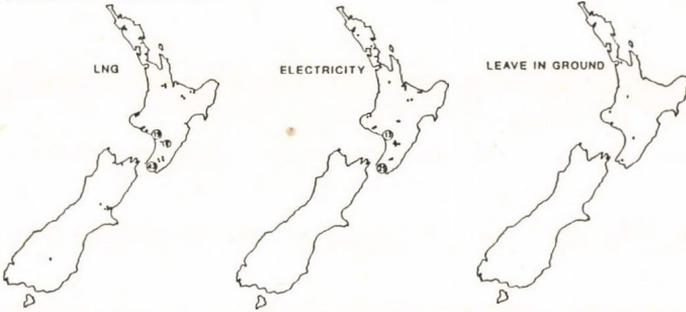
2. Preference for particular options

These complications are less troublesome when we consider any differential tendencies for responses from some areas to favour or disfavour a particular option. Looking just at the strongest statements of preference, wholehearted support or downright opposition, a spatial dimension to this aspect of the Maui PP exercise certainly emerges (*Fig. 6*). Clearest of the three is the LNG option, strong support for which is almost entirely confined to the Maui Coast both for individual and group responses. While such 'local' opinion is not one-sided as the Maui Coast opposition on *Fig. 6* shows, especially among individual responses, this anti-LNG reaction also extends to submissions from much further afield, including into South Island.

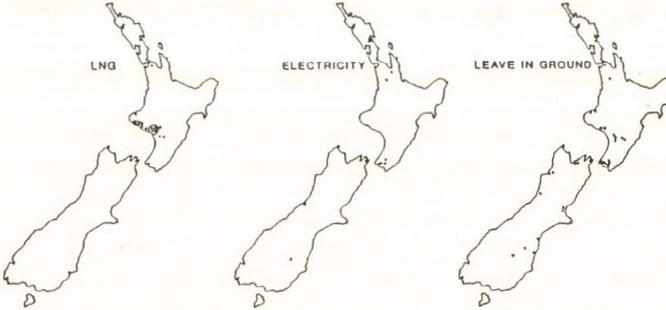
INDIVIDUAL APPROVALS



INDIVIDUAL OPPOSITIONS



GROUP APPROVALS



GROUP OPPOSITIONS

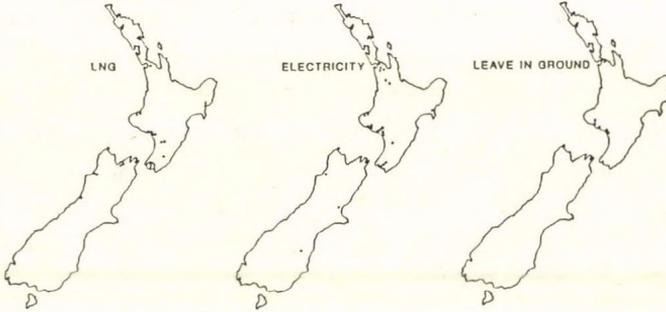


Fig. 6 Option support and opposition

Support for the NZED option is very sparse from individuals, although a small cluster of approvals comes from 'group' submissions near the Marsden Point power station (in Northland), which will be one of the recipients of any such Maui allocation. A strong 'anti' lobby from the Maui Coast also emerges on this option which, as comparison with the equivalent 'pro-LNG' maps shows, is not simply the result of the same individuals who support the first also opposing the second (this mirror-image response is more apparent in the group case). Finally, the submission patterns for the 'lig' option, which are predominantly favourable, show no obvious clustering as compared to that inherent in the responses in aggregate.

In sum, then, the geography of option reaction broadly confirms our expectations of its reflecting the differential local and regional significance of the three options on offer.

3. Local issues in option preference

Confining our attention to arguments raised by group and individual commentators about their *own* region or locality (rather than the significance of an option for some area elsewhere in New Zealand) Table 3 summarises the number of such citations by option type and the nature (if any) of firm preference shown. Not surprisingly in view of what has gone before, a clear packing order emerges, with the LNG option generating more such local comment than the NZED which in turn outnumbered 'lig', a sequence which holds alike for individuals and groups. The other obvious feature of the Table is that local issues are much more likely to be used by supporters of LNG than its opponents, for both categories of respondents. Space precludes our pursuing this local dimension in more detail here, suffice it to report that the 'pro' camp is impressed by the economic impacts the option promises for the Maui Coast, while the 'anti' lobby is more conscious of the possible consequences for the physical environment.

Table 3 Citation of local/regional arguments

	Attitude to option		
	Supportive	Intermediate	Opposed
Individual respondents			
Liquified Natural Gas	8	0	3
LNG			
New Zealand Electricity	0	2	1
Division (NZED)			
Leaving the gas in ground	1	1	0
Lig			
Group respondents			
Liquified Natural Gas	20	3	3
LNG			
New Zealand Electricity	5	6	5
Division (NZED)			
Leaving the gas in ground	2	0	2
Lig			

CONCLUSIONS

Taken together, these two case studies demonstrate how PP exercises can sometimes yield a variety of opportunities for geographical analysis, even if the results are not startlingly different from expectation. And, as suggested earlier, they also have a scarcity value in the field of public participation in energy policy, given its comparatively low profile both politically and academically to date.

The two surveys also serve to demonstrate how very different such PP exercises can be, and here four major contrasts between them are worth emphasizing:

1. The Maui exercise centred on an *immediate* nation-specific policy decision concerning an energy source, specific both as to the *type* of energy and the *location* involved. Esso's exercise, in contrast, looked at *long-term* futures over a complete band of energy types, assessed internationally.

2. While Esso's survey was an 'in house' exercise, with no assumed link to actual energy policy decisions, Maui offered the prospect that its outcome would be a significant input into future national energy strategy.

3. Esso adopted an 'active' approach, tracking down their respondents, while Maui's passive survey largely depended on respondents being sufficiently self-motivated to make their views known.

4. Esso, by giving their respondents neither the time nor the background context against which to consider their responses, collected essentially a set of 'knee-jerk' reactions, which Maui, *pace* the complaints about the pressure to respond quickly, was able to avoid.

Finally, on a pessimistic note, whatever the interest of these two very different exercises for geographers, they are not encouraging for a greater infusion of PP into this policy field. As just mentioned, Esso was not designed with this in mind, but, even so, to judge from the (lack of) citation of its results in the energy literature, the international comparisons it does shed light upon are hardly known outside the offices of the Esso corporation. But Maui, too, proved a disappointment. Despite the overwhelming vote being in favour of leaving the gas as a reserve for future needs, the New Zealand government subsequently announced the allocation of an extra tranche of natural gas for electricity generation, as strongly backed by its own energy Ministry, and without offering any reasoned explanation for its decision (EAC, personal communication).

However attractive as a general concept, public participation in policy formulation raises major normative questions of what should be the proper level(s) of such involvement

in the first place, and how the mechanics of garnering it should be tackled. The energy case raises particular difficulties of its own, which have acted as a dampener on public participation. If instead we focus on the pragmatics of its experience, on what actually has happened, we might make more progress, but it seems to be to the pessimistic conclusion that the views of the public will only be heard by policy-makers when they come at the right time and place to make them politically expedient. To this extent such 'progress' as it has made may be largely illusory. The ascent of Arnstein's ladder has scarcely begun.

Note 1

The measure of 'fit' (or 'satisfaction') between preference and energy futures as discussed in the last-but-one section, 2 and 3 can best be understood by a simple example. Assume the two profiles over three energy sources are as follows:

	'Preference' (% first choices)	'Future' (% supplies on energy-equivalent basis)	
	(a)	(b)	(a)-(b)
Coal	40	60	20
Oil	20	30	10
HEP	40	10	30
Totals	<u>100</u>	<u>100</u>	<u>60</u>

$$\text{Fit measure} = \text{Total } |(a)-(b)| / 2 = 60/2 = 30$$

This, is known as the Gini coefficient, is a simple measure of the difference or similarity of two percentage distributions arrayed over a common and mutually-exclusive set of categories. In this present case it can also be interpreted as indicating that the two profiles

could be made identical if either 30% of first preferences are changed, or 30% of future energy sources adjusted (or a combination of the two). Hence, for example, if the 30% 'excess' preferences for HEP were transferred to coal and oil the two distributions could become identical, assuming this was in the ratio of 2 to coal: 1 to oil.

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ENERGY UTILIZATION IN HUNGARY BETWEEN 1970-1986 AND ITS PROSPECTS

L. GÖÖZ

INTRODUCTION

As in the rest of the world, energy sources are being re-evaluated in Hungary because the economics of different fuels can no longer be ascertained by conventional methods. Today, environmental protection (at both macro- and micro-levels), safety and costs of waste treatment, the creation of new jobs and the consequence of irreversible global impacts have all to be taken into consideration. In addition, decentralisation of energy consumption is producing a need for the decentralisation of energy production.

ECONOMIC GROWTH AND ENERGY CONSUMPTION

Like other member states of the Council for Mutual Economic Assistance (COMECON), Hungary shared in the uncertainty over the duration of rising oil prices and was 4 to 5 years late in responding to the world economic challenge of the 1970s. After the immediate oil crisis, this fear was reduced by the introduction of the Bucharest principle, whereby the price of raw materials traded between member states is based on average world-market prices over the previous four years. Nevertheless earlier decisions made about investments in hydrocarbon energy sources continued to be implemented which, in the event, turned out to be a great mistake whose consequences

are felt to this day. As a result, there was no early restructuring of the economy to reduce energy consumption.

Between 1976 and 1981, a 1 per cent growth in national income demanded a 1.14 per cent increase in total energy consumption and a 1.17 per cent increase in the use of electricity (KAPOLYI, L., 1984). With its historically developed product structure and low level of technology, the Hungarian economy was too inflexible to respond to changes in the world market and carried on with modes of production that were highly intensive in the use of materials and energy. It was only in the late 1970s that the Government was finally forced to introduce policies for the more economical utilization of energy which resulted in a considerable reduction in the growth of demand for energy. The result of these new policies was that between 1981 and 1986 a 1 per cent growth in national income required no more than a 0.65 per cent increase in total energy consumption, but a 3 per cent increase in the use of electricity. The index of specific energy utilization, that is energy consumption per unit of national income, decreased by around 15 per cent, while the demand for electricity rose 16 per cent over this period.

In line with trends world-wide, the structure of energy demand has also changed, with domestic use in particular showing a rising trend. The following reasons for this may be identified:

- i) the building of new family homes with larger ground plans and a greater volume of inner space than traditional peasants homes which therefore, demand more energy for the purposes of heating. In many cases, new family homes replace former cottages heated by agricultural waste;
- ii) the demands of the population include the increasing use of energy for productive purposes e.g. for heating the plastic-foil greenhouses on household plots, and the energy utilised by private taxi companies, small-scale industrial activities and entrepreneurial ventures. In addition, the use of household appliances (refrigerators, automatic washing machines, water boilers etc) is becoming more widespread.

It is also worth noting that during the period under study the proportion of energy distributed by mains or grid networks increased from 26 to 45 per cent, while the share of other sources of energy fell by almost 20 per cent (*Table 1*).

Table 1 Structural changes in energy consumption between 1971-1985 (percentage distribution by source)

	1970	1975	1980	1985
Mains (grid) distributed energy	26.4	33.1	39.9	45.4
of which:				
natural gas	13.2	17.1	21.7	25.0
district heating systems	5.6	7.2	8.4	9.0
electricity	7.6	8.8	9.8	11.4
Other fuels	73.6	66.9	60.1	54.6
Total energy consumption	100.0	100.0	100.0	100.0

Formerly, the energy structure of Hungary was dominated by solid fuels but from around the mid-1960s on, hydrocarbons have gradually become more decisive, reflecting the exploitation of significant natural gas reserves, primarily on the Great Hungarian Plain, together with relatively cheap imports from the USSR. Liquid hydrocarbon consumption reached its peak (41 per cent) in 1987, but since then energy policy has been one of diminishing this source and replacing it by imported electricity and natural gas, together with the greater use of local coal of Eocene age and nuclear energy for domestic electricity generation. The outcome has been a reduction of 2 million tonnes per annum in the consumption of crude oil. Since the beginning of the 1980s coal has consistently accounted for 26-28% of the domestic energy budget. Hydrocarbon sources have fallen to about 60 per cent, within which the consumption of liquid hydrocarbon has dropped even more sharply to 32 per cent, while the use of natural gas has risen to 28 per cent.

Within the economic stabilization programme of the Hungarian Government, an energy policy has been outlined for the next decade. Four main issues may be identified. The first is the reduction of energy demand through the restructuring of the economy. A cost-benefit analysis of the material and energy demands of the various branches of the economy indicate that:

- i) an energy development programme must be tied into a concrete economic programme and cannot be independently designed;
- ii) energy policy has to be consistent with economic planning;
- iii) when economic planning is too general, no reliable estimation of energy consumption can be provided;
- iv) the level of energy demand is controlled by the economic structure;
- v) it is not so much the traditional methods of saving energy that is crucial in reducing specific energy consumption but the increase in value obtained by technical development.

Table 2, in which some of the major indices are presented, makes clear the more salient characteristics of primary production and manufacturing industry in the country. The basic materials industry is responsible for 15 per cent of GDP, but consumes more than two-thirds of total energy. As is well known there may be a 50-fold difference between average energy demands in the production of base materials compared with manufacturing industry, it is for this reason that the basic materials branch is the decisive factor behind energy demands in the whole economy. Changes in the proportions between branches, as a result of restructuring, greatly influence energy demands.

The changing structure of energy over the last 15 years outside Hungary may be summarized as follows. In developed countries, such as Italy, France, the FRG, the United Kingdom, the United States and Japan, whereas GDP has grown by

Table 2 Indices for the basic materials and manufacturing industries

	Contribution to GDP (Si,%)	Breakdown of energy consumption (E,%)	E/Si	Ratio
Basic materials industry	15	70	4.5	ca15
Processing industry	85	30	0.3	ca15

between 20 and 60 per cent, output from the energy intensive sectors, such as iron and steel, cement and plastics has either remained static or has fallen considerably below pre-oil crisis levels. Restructuring can be best observed in Japan, where output from the leading branches of electronics and instrument manufacture increased three to five fold, while production in energy-intensive industries stagnated or decreased. The contribution of the basic materials sector to GDP was only 24 per cent compared to a 67 per cent utilization of total energy. At the same time, modern high-technology engineering generated 40 per cent of industrial income but utilized only 3 per cent of total energy consumption. Energy-intensive branches usually demand large capital investments also.

As to the second main issue, in the coming decades the exploitation of economically viable home resources will come more to the fore. Hydrocarbon output is planned to continue at the maximum level permitted by the geology, but the exploitation of coal reserves will be controlled by economic considerations. The cost of hydrocarbon production in Hungary is well below the world market cost - the exploration cost per barrel of crude oil amounts to around US\$10 - and is therefore one of the country's most profitable economic branches. The nuclear and hydroelectric energy programmes, by contrast, will be determined within a complex framework of considerations.

The third main issue concerns fuel imports from the USSR. These are a central element of the plans in order to ensure continuity of energy supply, but other alternative sources are also under consideration.

The exploration and economic utilization of renewable energy sources has advanced little during the 1970s and '80s. At present, they are generally too expensive, but at least exploration should be encouraged. In the United States, for instance, where fossil fuel sources are available in abundance, renewable energy accounted for 10 per cent of energy balance in 1986, with energy derived from the biomass representing 6 per cent. To the extent that the 270 million inhabitants of the United States utilise 28 per cent of world energy output, the true significance of this figure can be understood. Passive solar batteries are employed in more than 200,000 homes and 800,000 other collectors of solar energy are in use. Moreover, 6000 wind generators are in operation with a capacity to generate 700 MW of electricity that is, 188 million kWh. Geothermal energy is also used in the production of 186.10^9 J of heat energy and 1500 MW of electricity. These figures illustrate that renewable energy can play an important role in the energy structure of a developed country, particularly in satisfying local energy demands.

A SUMMARY OF HUNGARIAN POLICY WITH REGARD TO ENERGY SOURCES

The integrated development of energy sources is envisaged for the future. Limited geological endowments make self-reliance in energy policy an impossibility and energy imports could never be reduced below 50 per cent even in the longer term. Set in this framework, domestic crude oil extraction will be maintained at 1.8 million tonnes and natural gas output at 6.5 billion m³ annually in future years. Coal for electricity generation and household consumption is viable up to a maximum production cost of 100 Ft per GJ and 160 Ft per GJ respectively, and assuming these values, a rise in the state purchase price of coal of at least 15 per cent seems necessary. Domestic demand alone requires an annual

output of 5-5.3 million tonnes of coal and briquettes. Output from deep collieries should not rise above 14-16 million tonnes, while open cast lignite mining for electricity generation is forecast to stay at 9-9.5 million tonnes per year. The most important expansion is expected in nuclear capacity and the Paks plant will acquire an additional 2x1000 MW of capacity in 1995. The structure of imports is not planned to change and only gas imports will increase as a result of Soviet-Hungarian cooperation in the exploitation of the Jamburg field. The building programme of generating station capacity is likely to be revised downwards in favour of a sustained growth in imported electricity. An energy policy that relies on combining various sources should be a strategy built around economic and technical considerations only and should not establish priorities among the different fuels.

Given the predicted increase in the demand for electricity means that generating capacity within the socialist countries should be expanded by another 2000-2010 to 4300-5600 MW. As has been mentioned already, the construction of the Paks Nuclear Station is on-going, while the building of the Bős-Nagymaros Barrage System, which will provide Hungary with an additional 430 MW of capacity, has also begun. But that said, a serious shortage of energy may emerge before the first 1000MW unit is installed at Paks in 1995, unless some interim solution to the problem of rising energy demand is found. The following alternative solutions have been proposed: the construction of a thermal power plant in the Bükk foreland (2000 MW); a hydroelectric energy storage scheme (4x300 MW); the installation of another lignite-based power plant (2000 MW); the building of a second nuclear power station (4x100 MW); the exploitation of renewable energy sources. Each one of these potential solutions, however, would require investments of hundred of billions of forints.

BIOMASS AS A SOURCE OF ENERGY: THE NORTHEAST HUNGARIAN EXPERIENCE

Finally, let us examine in more detail the prospects for the utilization of alternative energies in one region of

Hungary which suffers from a shortage of fossil fuels. The 1980 programme of the Hungarian Academy of Sciences for the utilization of biomass as a source of energy involved (LÁNG, I. 1983) an international survey of the current position and future prospects, even though the necessary technological background for the elaboration of any programme was not available at the time. Biomass programmes are preferred by environmentalists all over the world, since they involve the least amount of air pollution.

Biomass sources account for about 2 per cent of the energy balance of Hungary at the present time. These sources are fairly evenly distributed geographically, but some concentrations, for example, in Szabolcs-Szatmár county, may be observed. On arriving at the Soviet-Hungarian frontier large amounts of rail freight are transshipped from the broad Soviet to normal-gauge wagons and vice versa. Imported timber represents a major item of this transfer and has led to the preliminary processing of logs in the district for several decades. The utilization of the resulting waste (110,000 tonnes of chippings, bark, sawdust etc. annually) has, however, always presented a problem.

In the programme for the rational utilization of energy sources the economic use of forestry and timber residues is given special emphasis. The energy chemically bound in timber can be released through direct burning, or by gasification after chemical transformation and pyrolysis, or by charring into briquettes.

The bark peelings from Soviet conifer consignments produce 40,000 tonnes of waste annually, which used to be disposed of by burial on the floodplain of the Tisza at a cost 15 million Ft per year. Additional waste also results from other processes, for instance, polishing. Pressing into briquettes has proved to be the most economic way of utilising these residues and the expensive disposal of waste bark has been replaced, using contract equipment from the Swiss firm of ATS, by briquette production at the Tuzsér plant. The resulting output of biobriquettes is 20,000 tonnes a year, with a calorific value (3500-4000 kw/kg) equal to that of

the highest-quality brown coal in Hungary. To produce one tonne of briquettes, 1.4-1.7 tonnes of bark waste are necessary, depending on moisture content. Exports from the Tuzsér plant reached 5000 tonnes in 1987 and, at \$70 per tonne, is among the most economic investments in Hungary, with an amortization period of only one year. The ATS machines have also been used for other biomass (sedges, reeds, straw and maize stalks) processing and the results are promising. Previously, the utility of bark waste for compost-making had been investigated, but although suitable for growing flowers like carnations, could not be sold profitably on the home market.

In addition to the Tuzsér plant efforts are also being made in several other places in northeast Hungary, including Mátészalka and Vásárosnamény to utilize timber industry residue for energy production. The region is a major fruit-growing area, particularly for apples and some 135,000 tonnes of prunings are produced annually. However, the collection and utilization of this biomass has not yet been resolved, and the Rakamaz Cooperative Farm, a pioneer in this field, has stopped the experimental processing of fruit-tree trimmings as unprofitable. New technology, perhaps the application of mobile waste processors may prove more effective in this respect.

In view of the region's lack of fossil fuels, renewable energy sources (biogas, solar, wind and geothermal energy) will have to be exploited on large scale in the future and this is a trend which is also being encouraged by local government bodies.

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LAND EVALUATION STUDIES IN HUNGARY

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Edited by
D. LÓCZY

The Geographical Research Institute of the Hungarian Academy of Sciences has elaborated a method for determining crop-specific land suitability. The first part of this volume briefly describes this procedure and the way land suitability grid maps for individual crops are combined to show the areal distribution of types of agricultural habitat. The resulting regionalization is an important tool for regional planners since it portrays the allocation of land resources on a simple map and promotes specialization. The agroecological regions thus identified can, however, only reflect the physical potentials in the area. For a complex land evaluation this first stage of the survey has to be supplemented with the assessment of economic factors. As the complete methodology of an economic evaluation of land has not yet been elaborated for Hungary in a final form, an experimental method is presented here by L. Góczán (who has also guided the agroecological regionalization project). In the second part, he attempts to compute another numerical value incorporating gross production value, labour and capital investments as well as the numerical value of the agricultural habitat.

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