



# German research in transport geography: Life in the space between objective analysis and political advice<sup>1</sup>

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## Abstract

Transportation has been a bone of public contention for decades, the discussion ranging from traffic-calming measures in individual streets to the continual growth of global transport movements. In the last 20 years transport topics have also received increased attention within the discipline of geography, be it academic, professional or in schools, but the topics addressed by today's transport geography have almost nothing in common with the roots of the field. This means that transport geography is a handed-down, hyphenated sub-branch of geography in name only. In fact, the name refers to a field of geography that is experiencing not only all the birthing pains and uncertainties of a discipline in the process of defining a new direction for itself, but also the sense of excitement and thrill of the new. This paper sets out to show both the role transport geography plays as part of human geography with its concepts and paradigms, and also the role it plays within the political debate on transport. An appeal is made to geographers to become more involved in this branch of our science.

## Origins and development of transport geography

The position today of transport geography can be better understood if its roots and history are briefly sketched. The main root of 'classical' transport geography lies in the treatment of questions relating to distance and cost. The question of distance took on a new importance for the economics-biased disciplines with the exploitation of colonial areas outside Europe and the change in transportation possibilities in the age of steam. Transportation networks, global trade flow and the effects of national and international (spatial) expansion on the national economy were treated as aspects of economic geography, and thus questions and theories relating to transportation entered the geographer's orbit. Equally, the economic theories of location of von Thünen, Weber and Christaller, which are today still fundamental to economic geography (see, e.g., Schätzl, 1978), show that distance was recognized as a central factor in economic development in the second half of the 19th and at the beginning of the 20th centuries.

Because the most significant theories relating to transport were closely connected to economic questions, transport geography was seen for a long time as an integral part of economic geography, a point of view reflected, for example, in the title of Obst's 1960s textbook: *Wirtschafts- und*

*Verkehrsgeographie* (Economic and Transport Geography). Similarly a title by Otremba in the mid 1970s: *Handels- und Verkehrsgeographie* (Trade and Transport Geography). Even text books specifically dedicated to transport geography, such as Fochler-Hauke's 1957 volume, tend to see transport largely as a supply function of economic processes, and as a consequence Fochler-Hauke differentiates between land, sea and air transport, and communication. Land transport routes, harbour types and shipping lines are then described for each of these types of traffic. Voppel's book, which was published in 1980, takes a similar approach, the expansion potential and spatial effects of transport routes forming the central focus, while the work ends with a chapter on the relationship between 'traffic area and economic region.'

Important to note is that while other branches of human geography underwent fundamental changes in the 1960s and 1970s, transport geography remained close to its roots, and by and large restricted itself to describing inter-regional and international traffic routes, media and flows. Unlike the transport geography of the 19th century, which had had a significant (geo)political element, the post-1945 version was characterized by a strongly apolitical tendency for a considerable time, probably more so than other branches of human geography. This brought with it a focus on the macro- and meso-levels, and the micro-level of urban transport was largely ignored by the mainstream of transport research until far into the 1980s.

Perhaps symptomatic of this situation are the fields dealt with by the *Geographische Rundschau's* special volume

<sup>1</sup>This article is based on a state-of-the-art-paper presented on October 10 1999 at the biannual *Deutscher Geographentag* (Symposia of German geographers) in Hamburg. Even if the article focuses on the situation in Germany, the analysis is valid to a great extent for other countries as well.

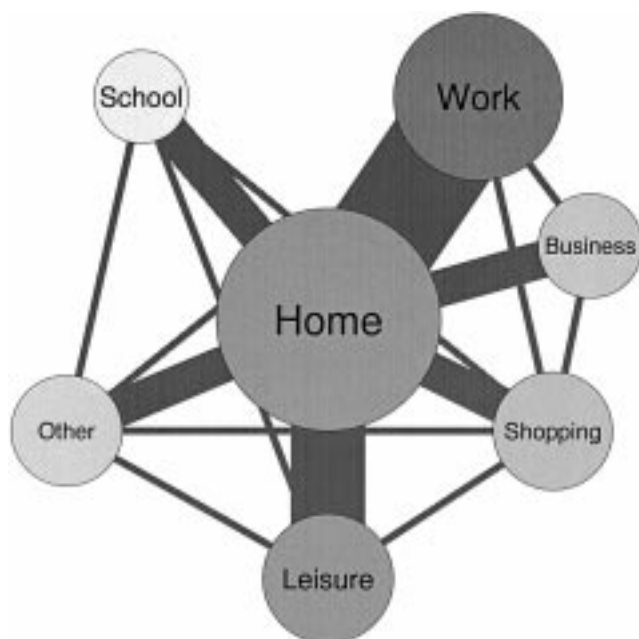


Figure 1. Traffic participation as binding element between the other basic functions (Source: Maier and Atzkern 1992).

'Transport und Verkehr' (Transport and Communication), published in 1994. After an introduction by Nuhn on the development and perspectives of transport geography, there is a discussion of;

- the expansion of European transport networks
- the development of European air transport
- structural changes in sea transport and their effects on European ports
- changes in the logistics and transport industry and
- telecommunication in the European internal market.

There is only one article on the micro-level of urban transport, and significantly it deals with the effects of structural change in the retail sector on customer and supplier traffic, in other words with an aspect of transport closely connected with economic function. Even the recent textbook on transport geography by Maier and Atzkern, published in 1992, sees "transport geography as a part of economic geography" (1992, p. 231). However, the topics that the authors discuss reflect a fundamentally new approach within transport geography that was barely acknowledged in the previous summaries. Building on the functional perspective introduced by Christaller (1953), the Munich school of social geography added a new dimension to transport geography and this is appraised by Maier and Atzkern. 'Traffic participation' is understood as a basic function that has a binding significance between the other fundamental functions of existence (see Figure 1), and the bias towards giving goods and economic traffic a central importance, inherent in a strongly economic geography-based point of view, is countered by the social geography approach which foregrounds passenger traffic. The analysis of spheres of activity and choice of transport mode for different travel motives nowadays belongs to what we might almost call classical approaches in transport geogra-

phy. Heinritz (1998, p. 56) identifies an Achilles' heel in the Munich school approach to social geography by noting that it fails to consider how normative ideals come about and ignores value scales and ideal goals. This weak point has been particularly noticeable in transport geography studies based on the Munich school approach because, although many of the studies (see, e.g., Maier 1976) are concerned with transport behaviour, they generally do not go beyond the description stage.

As a result of the influence of social geography on human geography in the 1970s and 1980s, two aspects of transport remained largely unconsidered for a long time. These were:

- 1) The cause of traffic and the reasons for choice of transport mode, in other words, the interpretative dimension, is essential to the analytical understanding of transport geography questions.
- 2) In addition to the descriptive analyses and in view of the negative effects traffic has, the question cannot be ignored of what form plans for the future should take. In other words, attention must be paid to normative aspects in order to influence human behaviour.

To recap briefly at this point; on the one hand, for a long time transport geography used approaches closely related to economic geography and on the other, it adopted methods suggested by the Munich school. These factors together set the subject on 'a triumphant march to nowhere' (Heinritz, 1998) because they did not permit consideration of other problems important to the development of the field.

### The position of the subject in Further Education or: Is transport geography the Cinderella of geo-sciences?

One of the more recent attempts to reflect on the current state and future prospects of transport geography is that undertaken by Nuhn in 1994 in the pages of the *Geographische Rundschau*. The article begins: "The overriding importance of transport and the amount of attention transport questions receive in the media are in conspicuous contrast to the lack of weight the same topics are given in today's geography, both pure research and teaching" (Nuhn 1994, p. 260). There is no need to repeat in detail here his analysis that although transport geography questions played a central role in the beginnings of scientific geography at the end of the 19th century, they have been increasingly relegated to the sidelines of the subject since the end of the Second World War. Nuhn provides powerful support for his theory in form of the numbers of articles published in geography journals.

He evaluates the contributions to three geography periodicals in 3-year intervals between 1971 and 1991. The three periodicals, which are aimed at a scientific readership, were *Erdkunde*, *Erde* and *Geographische Zeitschrift*. In addition, Nuhn evaluated the leading journal for teachers, *Geographische Rundschau*. He discovered (Figure 2) that the specialised periodicals published on average less than one transport geography article per year, and in the 6-year period between 1977 and 1982 a grand total of just two

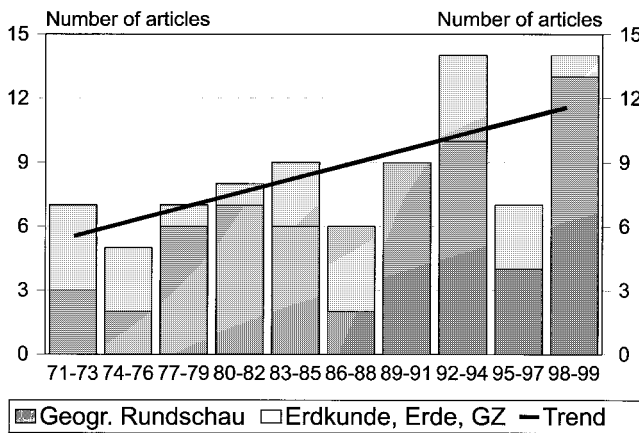


Figure 2. Transport geography articles in selected German periodicals 1971-1999 (Source: Nuhn 1994 and own figures)

contributions appeared in their pages. On the other hand, *Geographische Rundschau* alone published almost twice as many papers on transport geography-related topics as the other three journals together. Nuhn also drew a comparison - not shown in the table - with two English-language periodicals, the Dutch *Tijdschrift voor economische en sociale geografie* and *Economic Geography*, i.e. journals with no particular focus on transport geography, and found that these two had published as many articles on transport geography themes as the four German journals together. In addition, the fact must be taken into consideration that Anglo-American geographers also have specialized journals on transport geography (e.g. *Transport Geography*). Nothing has changed dramatically since Nuhn's survey. While the 3 renowned journals have published just 8 articles on transport geography topics over the last 8 years, the *Geographische Rundschau* alone has published 27.

The increase in importance of transport-related topics in public debate and planning over the last 30 years has indeed been reflected, at least partially, in geographical periodicals, as the rising trend line indicates. However, the rising tendency can be attributed directly to the *Geographische Rundschau*, i.e. the periodical that is most clearly aimed at a readership outside the academy. Perhaps the social relevance of the subject is of greater concern in these circles, and thus the demand for transport topics is greater.

These results could of course be interpreted as meaning that the quality of transport geography work is not high enough for publication in respected specialized journals and so must appear in a periodical with a more general readership. However, a look at the main focus of study as defined by the members of the *Verband der Geographen an Deutschen Hochschulen* (Society of Geographers at German Institutions of Further Education, VGDH; Dittmann and others 1996) themselves shows that the rate of publication does in fact reflect the degree of intensity to which transport geography-related questions are being investigated in the academy. Thus, 'historic geography' is significantly more studied than transport geography, and 'population geography' or 'geography of tourism' are named as a research focus by geographers in German tertiary education estab-

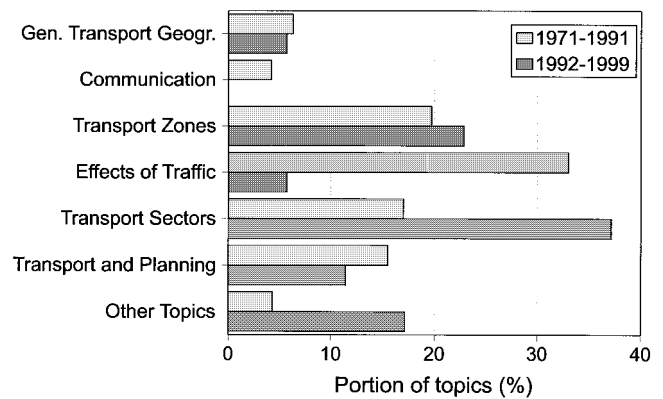


Figure 3. Topic groups of transport geography articles published in selected German journals 1971-1999 (Source: Nuhn 1994 and own figures)

lishments twice as frequently. Similarly, there is - apart from the 1992 book by Maier and Atzkern already mentioned - currently no up-to-date German textbook for this branch of geography on the market.

In contrast, the working group 'Transport' within the *Deutscher Verband für Angewandte Geographie* (German Association of Applied Geography, DVAG) is the second largest of all, and a large number of the members of the *Verband der Stadt-, Regional-, und Landesplaner* (Association of Municipal, Regional and State Planners, SRL) are also registered members of the study group 'Forum Mensch und Verkehr' (Forum People and Transport) (SRL 1999). On the other hand, a working group on transport within the *Deutschen Gesellschaft für Geographie* (German Geography Society, DGfG) was founded only in 1997 at the last Geographentag in Bonn and, in contrast to many other working groups, this one is dominated by students, professional geographers and young academics. While the phenomenon 'transport' continues to lead a Cinderella existence within academic geography, it has taken on a far more central position among geographers working outside academia and graduates from related disciplines.

However, it is not only in the simple numbers that there is a notable difference between the transport geography in academia and that in 'outside world.' The article by Nuhn mentioned above (1994, p. 292; see Figure 3) shows that a majority of scientific articles in the 70s and 80s are heavily concentrated on three aspects of transport geography:

- 1) Continuing a tradition from the beginnings of transport geography research, the structural effects of the development of transport in a given area are analyzed. The header 'transport zones' encompasses particularly the effects of development of large-scale transport projects.
- 2) The economic effects of transport infrastructure and behaviour as a whole also form a large part of the transport geography debate among researchers. This range of topics once again shows that transport geography is rooted in, has close affinity to and is influenced by economic geography, by the fact that they are dealt with very much from the point of view of the relevance of economic factors (just in time production, European internal market) for transport behaviour and infrastructure. The measures

undertaken in the last few years to expand transport infrastructure and the continually rising levels of traffic connected with this are in addition closely linked to considerable ecological effects, and these have come increasingly into the focus of academic geography. It is indicative of the importance given to these topics that Nuhn groups them under the heading 'Effects of traffic.'

3) A third category defined by Nuhn is 'Transport Sectors' and includes - as it did in the 1950s in Fochler-Hauke - land, sea and air transport. However, communication as a sub-aspect of transport geography is no longer included in this category but - on view of the increasing importance of IT- is given its own heading.

Aside from the generally low status that transport geography has within academic circles, the majority of publications on transport-related topics limit themselves to descriptions and analyses of changes in transport zones, infrastructure and behaviour. In contrast, questions relating to the causes of transport requirements, the socio-political framework of transport behaviour or the possibility of actively influencing it are only very rarely raised. In this little has changed over the last few years, as the continuation of Nuhn's analysis in Figure 3 shows.

However, geography in practice (i.e. outside the academy) is much more concerned with influencing and planning transport behaviour, and this difference in focus is another clear discrepancy, in addition to quantity, between academic and applied geography.

### **The relationship between transport science, transport planning and transport geography**

Before going into the relationship between transport geography research in institutions of higher education and transport geography in practice in the wider world, we need to examine the context in which transport geographers outside academia move. Transport planning was limited to the provision of infrastructure elements and media for a long time, and this concentration on the construction and maintenance of roads, railway lines, canals and the relevant machinery meant that 'transport' was primarily the concern of the engineering sciences. While the means of transport themselves were built by the mechanical and electrical engineers, the civil engineers undertook what might be called transport planning in the true sense. The demand for transport was to be answered with the creation of the necessary infrastructure. As mentioned above, inter-connected transport possibilities are important pre-conditions for economic activity and the private development of people, and as such it was seen as a goal for society in general that this framework be optimised to these ends.

The expansion of transport infrastructures, which has never seemed to reach saturation point, has been paralleled, particularly in the late 20th century, by a continual growth in demand that has now led to considerable overloading and impairment. The demand for transport in urban areas, especially, has not been satisfied despite intensive planning efforts from the 1950s through to the 1970s simply because

of the limited space available. The attempt to disentangle the various means of transport by taking them under or elevating them above ground level failed to ease the strain in principle and in the last few years electronic flow control systems have been increasingly put into place. However, it now appears that such systems have only a limited effect and do not fundamentally change traffic conditions in urban areas (see, e.g., Schreiner, 1998).

The 1970s brought the realisation that no engineering ingenuity would ever allow motorised individual transport (MIT) to fulfill all the 'transport demands in European towns and cities, at least not in their current form. The high levels of use and wide range of functions found in urban areas exceeds the space available for MIT, moving and parked, and this is certainly one of the reasons that 'transport' has become more subject to scientific enquiry, in addition to the strong influence it has had on civil engineering planning and development.

Transport planning had thus far been largely concerned with the supply side of the equation, i.e. answering a demand, overt or latent, for transport, but now influencing the demand itself became the second element in the development of the subject as a science. (Steierwald and Künne 1994, p. 6) The goal of transport science now became to influence the choice of means of transport, to entice users away from MIT and towards public transport (PT). It was assumed that speed and cost of travel were the decisive factors in this choice, and a parallel, equal alternative to MIT was created with the expectation that demand would increase once these disadvantages were removed.

Despite considerable expansion of the public transport system, insufficient numbers of people chose to use it in preference to private transport and the previously narrow approach was broadened at the end of the 1970s. Transport science began to look to the humanities for ideas and possible solutions as they viewed transport participation as the result of individual decision-making processes. In addition to revealing the link between socio-demographic factors and choice of transport, the application of approaches used in social psychology for the interpretation of environment perception showed that the objective features of the various alternatives were not decisive, but that the subjective opinion of the individual was prevailing (see, e.g., Held, 1980). This meant that classical transport planning could no longer confine itself to simply answering a demand: The image of the transport medium in question also came to be seen as crucial. Accordingly, the campaigns undertaken in many towns and cities since the 1980s have attempted to push public transport systems into a more central position in the public consciousness and create positive attitudes towards them (VÖV, 1989). As a consequence, the 1980s and 1990s saw a marked expansion and diversification of what was originally a very narrowly-defined transport *science*, and we now speak of transport *sciences* in the plural.

Human geography has also begun to look at transport in view of the increased relevance of the humanities in the analysis, forecasting and planning of transport. Transport geographers working in practice concern themselves

more and more with transport management concepts and are sometimes actively involved in drawing them up (see, e.g., Deiters, 1991, Monheim, 1997). Against the background of the debate on sustainability and in view of the fact that no satisfactory solution has yet been found, we can assume that transport as a topic will take on an ever-more important role in political, social and scientific circles. With this in mind, we must consider the relationship between theoretical and practical transport geography.

### Transport geography at university and transport geography at work: polar opposites?

On the one hand we have thus far seen that topics relating to transport geography receive no great attention, quantitatively-speaking at least, within academic geography and, on the other hand, that the topics that do receive attention make only a limited contribution to the solution of problems in the socio-political discussion. In contrast is the considerable pressure exerted by the traffic problem and the need for solutions: The transport field is also an important sector of the job market for geographers outside the academic world.

The opposition to transport geography from other geographers can perhaps be summarized in two ways:

- 1) Transport geography is not supported by a stable framework of methods and concepts. The approaches used borrow from very different disciplines and so are often theoretically and methodically not particularly sound.
- 2) Because applied transport geography questions most frequently mean transport planning, this in turn means a political context and thus the danger of giving up scientific neutrality and being too strongly influenced by the subjective positions of the actors involved.

Of course, academic research, with its clear orientation towards fundamental principles, can never take on the task of practical application, but in the ideal situation it would provide methodological and conceptual foundations, and support for work in 'the real world'. The current discrepancy between transport geography in research and in practice requires that we tackle both objections mentioned above.

#### *Application without concept?*

In his attempt to describe transport geography as a spatial supply-and-demand system, Schliephake (1996) drew up the sketch reproduced here in Figure 4. Transport is here differentiated between 'transport demand' and 'transport supply', each of which have spatial aspects. It is also clear that very different disciplines are concerned with transport infrastructure. Transport technology still clearly dominates the supply side of the equation, but Schliephake also includes economics, 'transport geography (in the old sense)' and development planning on this side of the balance in his model. The humanities, in addition to transport science in the true sense, are particularly involved on the demand side. Of course, sociology and psychology could just as well be listed here in place of social geography and population geography.

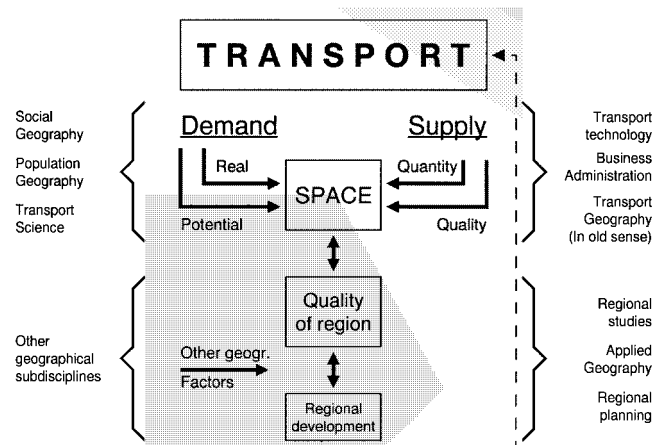


Figure 4. Transport Geography's Subject: Transport as a spatial supply and demand system

This picture also characterizes transport geography, which sphere of influence is represented by the shaded area. A wide variety of approaches from disciplines ranging from economics and engineering via the social and political sciences to psychology mean that transport geography remains, in Schliephake's words, "shimmeringly diffuse" (1996, p. 38).

As a result of this diversity, transport geography studies are often notable for the fact that they seem to pick and choose at will approaches from related disciplines according to which appear most efficacious, but such heterogeneity does not necessarily have to be adjudged negatively. Similarly, the lack of studies summarizing and synthesizing various approaches used in transport geography undoubtedly contributes to the diffuse image the discipline presents to outsiders.

However, this image is rooted in the traditional view that academic disciplines are defined in terms of their fundamental theories, concepts, paradigms and methods. Seen from this viewpoint, transport geography - and indeed the majority of the other transport sciences - certainly cannot be clearly defined as it lacks both original theoretical concepts and specific methodological approaches.

Wehling (1998, p. 11) suggests a different point of view when he argues that transport science should be seen not as "a separate discipline but as a trans-disciplinary field." The term 'trans-disciplinarity', which often appears in connection with evaluating the impact of technology, is understood here as a further development of inter-disciplinary co-operation. Mittelstrass (1993, p. 165) for example, emphasizes that the various disciplines involved in inter-disciplinary research in the past simply contributed analytical building blocks to the process and were not themselves changed by their contact with other branches of knowledge. In contrast, trans-disciplinary approaches directed at specific problems would force individual disciplines out of their highly specialized niches and open them up more to the wider context.

Thus, the research field of transport science would be structured according to the problems and questions raised by the focus of interest on distance and the crossing of it. Such a



Figure 5. Relationships between important factors in the origins of traffic

diverse complex of problems certainly cannot be satisfactorily tackled by one discipline alone, but the integrity of the research field would come primarily from a common motivation, embodied in the problem or syndrome, rather than from any unifying theoretical and methodological relation.

Looking at the factors relevant for the origins and character of traffic (see Figure 5) in its many forms shows that viewing transport and mobility as a trans-disciplinary field possibly better encapsulates transport science's position than the attempt to see it as an individual discipline in the traditional sense<sup>2</sup>.

Whereas in geomorphology all the factors influencing the geomorphodynamic can be found within one single scientific context, or the development of a specific landscape can be explained with the help of relatively homogenous historical geography approaches, transport behaviour is influenced by a range of very heterogenous factors that are also influenced by each other. Of course it is tempting on the one hand, and desirable on the other, to try to combine all these factors into one meta-theory, but the complexity of the relationships between the factors themselves and the imprecision inevitable (and generally accepted in the humanities) in describing the human behaviour which affects many of the factors means that I think the likelihood of this ever being achieved very small. All attempts to develop an integrated theory will have to accept that they fall short of completeness.

Looking at the conditions affecting the origin and character of traffic also makes it clear that concrete transport activities and processes constitute only a small part of the research field. There are aspects relevant before any physical participation in traffic, and these range from individual

<sup>2</sup>The influences included here do not claim to be a complete list of all factors relevant to mobility. The figure attempts to take into account the most important ones, but ultimately the number affecting traffic in some way or other is infinitely large.

decisions (such as where to live or whether to buy a car), via the economic, political and technical frames of reference, to lifestyle questions. In order to acknowledge the importance of these factors, it would perhaps be a better idea to use, instead of transport sciences, the term 'mobility studies.'

#### *Scientificity in mobility studies*

Mobility studies could be one of the kind of research fields that Bechmann and Frederichs call 'problem-oriented research'. Pure and applied research cannot be clearly separated in such fields; instead, the more theoretical or practical modes of inquiry are combined in fresh ways according to the problem at hand. The changing patterns and formations resulting from such flexibility could lead to a new dynamic in the relationship between geography in practice and in research. It is important to stress, however, that this way of considering mobility studies is not simply a case of giving the emperor a new suit; it brings with it instead a number of implications:

- 1) Similar to the study of the environment or perhaps urban areas, mobility is a field that cannot be adequately treated within the traditional disciplines, and so a trans-disciplinary research takes on a whole new value for human geographers.
- 2) The desirable content components of geographic mobility studies can be derived from this understanding: research into the causes of traffic replaces as the focus of interest the description of supply and demand in spatial dimensions.
- 3) Whereas research today is often pressed into the role of a 'supplier' of concepts for translation into practice, problem-oriented research which looks for (at least partial) solutions can also include some practical elements. In other words, pure research and practice would have to work much closer together according to this view of mobility studies.
- 4) The fact that the political background is seen as one of the relevant factors - once again, parallels may be drawn with research into the environment and urban areas - means that this aspect must also be included in the research sphere, and not as an implicit, generally undeclared preconception on the part of the researcher, rather as an element that must be openly acknowledged, analyzed and evaluated. This means that mobility studies by their nature always contain elements of political consulting also.
- 5) The moment that social values and norms become objects of scientific study, it becomes impossible to argue the case for studying them from within the boundaries of science alone. The justification must be developed in dialogue with those very social values and norms. Dialogue here means that the social conditions are not simply accepted but rather seen as hypotheses that flow into the research process and are returned to the socio-political discussion in the analytical results in the form of 'if... then' statements.

If we understand problem-oriented research as the integration of the search for the roots of problems and the

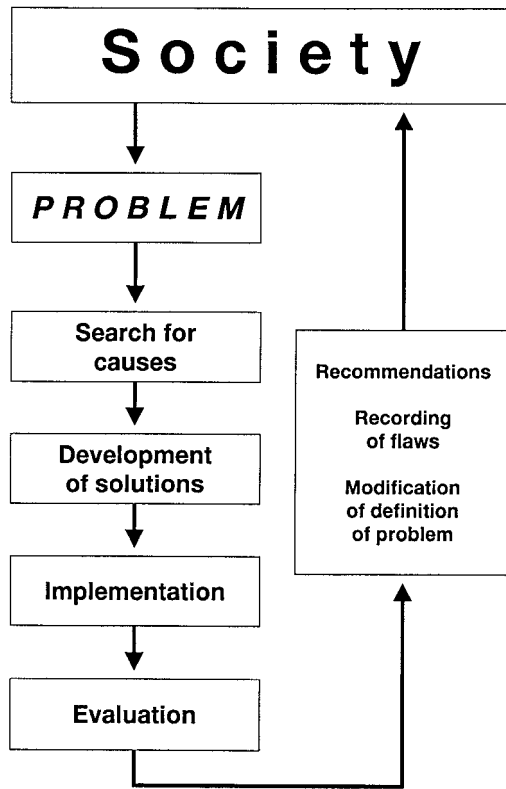


Figure 6. Problem-oriented research as interaction between analysis and praxis

development, application and evaluation of solutions to those problems (see Figure 6), the clear differentiation between theory and practice disappears. Research and praxis are no longer two separate approaches but now form part of the problem-solving process; in the context of mobility studies, this could perhaps be called 'mobility management'. This standpoint defuses the oft-noted tension between theory and praxis in transport geography to the point where even the discussion of it might become spurious. A gulf between analysis and application opens up only when the analysis is divorced from social problems and has no direct relationship to practice.

A considerable amount of transport geography research at universities is largely self-referential (i.e. written by geographers for geographers), with the result that the political aspects of the field are given only passing attention, but the last few years have seen the publication of a number of studies that take a problem-oriented and thus politically aware approach. As an example we may mention the work of Markus Hesse, whose dissertation (1993) and study on goods transportation (1998) both consciously thematize the political and social aspects of any treatment of transport topics. His 1996 study also explicitly considers the political advisory aspect involved in estimating the effects of new technologies.

In addition, the goal of formulating and implementing sustainable transport systems has acknowledged the sustainability discussion of the 1990s and this has led to the boundaries between theoretical and practical research, as sketched above, becoming increasingly blurred (Kager-

meier, 1998 and 1999). With a few years' delay, German transport geographers have begun to react to the impulse given by colleagues in other countries (see, e.g., Breheny, 1992; Banister, 1995; Tolley, 1997).

## Conclusion

The thoughts on transport geography presented here can also to some degree be applied to many other areas of human geography. In my opinion, geography has not concerned itself enough in recent decades with new fields such as regional planning or ecology, and other disciplines have been able to manoeuvre into much better positions. Even what would appear to be geography's domain, the description and analysis of spatial features, has, with the advent of new technology in the form of the geographical information system, been increasingly undertaken by geodesy, with the result that geography will lose another field to a related discipline before long. Now that the blank spaces in the atlas have largely been filled in and that society offers only limited support to scientific disciplines that are not concerned enough with social problems, geography – and not just mobility studies – must stand up to the challenge facing it. Otherwise it risks being one day marginalized or even eliminated completely.

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