

Comment

Just the facts

Peter Taylor's editorial comment 'GKS' in the July 1990 issue asks what the GIS phenomenon means to contemporary human geography, and specifically political geography. Taylor is eminently qualified to ask, and the result is something of a landmark, perhaps the first serious effort to address a very challenging set of questions. The enormous growth of interest in GIS and its relatives in the 1980s has indeed changed the perception of the discipline, and the gap between the external view of geography, and the philosophies espoused by many of its intellectual leaders, may be wider than ever.

Taylor characterizes GIS as a technological package for treating any systematic collection of geographical facts. He emphasizes the difference between facts, information, and knowledge, arguing that GIS in itself is intellectually sterile, as a theory-neutral tool for working with facts, and invites political geographers to determine how the tool can be useful in building knowledge in political geography. The same argument might be applied to any branch of geography, or any other discipline working with geographically referenced data.

Layered on top of this argument is another, that GIS is the intellectual heir of the quantitative revolution of the 1950s and 1960s, and of positivist spatial science. 'The positivists' revenge [for the 1970s critiques] has been to retreat to information . . . the result has been a return of the very worst sort of positivism, a most naive empiricism.' (Taylor, 1990: 212). It is 'the current cohort of quantifiers' (p. 212), 'the new quantifiers', who are responsible for GIS. Taylor sees Derek Gregory's portrayal of the early quantifiers as 'latter-day Victorians', as a 'cruel attack' (p. 211) that left quantitative geographers as heirs to a discredited philosophy, but makes the same mistake in linking GIS with the failures of spatial science.

The facts that populate an airline reservation system are just that—presumably accurate statements. Some geographical facts are also trivial, however hotly pursued. But the earth's surface is infinitely complex, and with few exceptions reveals increasing detail without limit. Geographical facts change with scale, and Mandelbrot's apparently innocent 'How long is the coast of Britain?' (Mandelbrot, 1965) conceals a wealth of intellectual interest that is utterly missing in Maling's 'How long is a piece of string?' (Maling, 1968). All geographical information must somehow be generalized, abstracted, compressed, discretized, whether its destination is a map or a spatial database. Cartography is not simply a process of data handling, and generalization is not simply a low-pass filter. Neither is it theory-neutral, as J. B. Harley (1989) shows in a lengthy discussion of the map as text. Describing the world is part and parcel of the geographer's art, and very far from 'trivial pursuit' (Taylor, 1990: 212).

The technological problems of GIS have produced a wealth of research into data structures and algorithms, but these issues are largely in the domain of computer science. GIS research in geography is increasingly concerned not with the technology, but with the set of issues surrounding its use. For example, insensitive treatment of the content of maps

and databases as reliable facts has led to endless problems with error in GIS applications that will only be corrected by a better understanding of geographical uncertainty. The blithe assumption that GIS will inevitably lead to better decisions echoes earlier illusions over location-allocation, and needs to be dispelled with good research by geographers on the nature of spatial decision-making, and the role of tools in the process. The design of GIS processes for data generalization and data modelling needs to be guided by people trained in the nature of geographical phenomena, and the art of cartographic abstraction. Knowledge about how humans learn, reason and communicate about space is the appropriate basis for improving the design of GIS user-interfaces. Finally, there is a real need for studies of GIS as a phenomenon, of its causes, and of its influence on the place of geography and geographical information in human existence. Yet all of these issues are not new with GIS, but have formed part of the research agenda for decades. What GIS has done is to provide a new urgency. At a trivial level this is the geographer with nightstick watching over GIS users—at a more profound level it is the geographer as developer and custodian of the geographical knowledge that is needed if GIS is to be used in meaningful ways.

Some of this research has echoes of the 1950s and 1960s, but much of it is concerned with issues that were ignored by the quantifiers, who did indeed prefer precise, unabstracted facts from sources such as the census over the fuzziness and generalizations of cartography. Some of GIS research is positivist, particularly where it intersects with human spatial cognition. But Heywood (1990: 850) goes so far as to assert that 'GIS technology has reaffirmed the importance of the positivist approach to problem solving within the social sciences', which is a statement not about GIS research as defined above but about research done with GIS, and it is hard to see how any tool can have that effect.

Nevertheless, there are grounds to believe that GIS is no mere tool. It is doubtful if the slide rule or pocket calculator ever provoked profound geographical thoughts. As long as the computer was a mere calculating machine there was no doubt as to its place as a tool. But much of contemporary thinking in cognitive science has been stimulated by the brain/computer analogy. If 'Maps are, in the final analysis, the way geographers think' (Abler, 1988: 137) then a major change in the technology of mapping might be expected to provoke reasonably profound thoughts from geographers. Society is in the midst of a major change in the way geographical information is collected, perceived, managed and used, and GIS is as good an umbrella label as any for what is happening.

So what does this mean for political geography? Taylor has already urged political geographers to think of how GIS might be of use as a tool in building the store of knowledge—the GKS—as distinct from the store of facts. Coupled with this is the issue of how GIS is currently deficient from the perspective of political geography—can the user (or non-user) help the tool-maker improve the tool? But GIS as a tool is also coming into the hands of political redistricters, analysts of voting behaviour, political parties, and assorted decision-makers. If GIS makes the geographical perspective easier to render, then it will change the importance of place in a whole range of human activities. What uses will people make of it, and how will it change their worlds?

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