

Geography and the Study of Interaction between Nature and Society

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The Swedish National Committee has asked me to discuss Geography, Nature and Society. I was given a free hand to deal with the theme. Thus the points of view and suggestions that follow are my own and not the collective standpoint of the Committee.

Geography, Nature and Society—these concepts—each in their own way—are immense in scope and complexity.

Geography—Although we have all come together for a World Congress and feel devoted to a common task we approach our field from many different perspectives and practice it in many different ways. Even if we ourselves are able to recognize a fellow geographer from other brands of scholars we have great difficulties in giving a coherent explanation to members of the outside world why they should take our work seriously and make use of the insights we like to tell them that we can provide.

Nature—The world to which our bodies belong, where we seek food, material and recreation and in which hundreds of specialized sciences have identified millions of items, phenomena and relationships, rendered in a confusion of tongues. How can any sane person dare to confess a hope that he can say something about how to view Nature as a wholeness?

Society—This peculiar mix of mental and physical structures, confusing and unpredictable, without which we cannot survive but with which we frequently find it hard to live. No unified science of society has been generally accepted so far and if it comes I doubt that we really and honestly would like it. Would we care to exist under circumstances which were wholly predictable, free from surprise and hostile to spontaneous creativity? Fortunately, there is little likelihood that a social science of that power can be construed.

Nevertheless, we would like to know something more than we know now, so that the interaction between Society and Nature can be understood in a more coherent way. On the purely practical side, for example, there is an urgent need in large parts of

the world to discover how to procure adequate amount of food and shelter. In other parts of the world the more pressing problem is perhaps how to make the individual human life into a rich experience and still have fresh air, water and silence and be able to let fellow animals and plants live their lives in peace.

Interaction between Nature and Society is appearing new forms and is taking on new scales as the scientific and technological revolution is making its way. Some people believe that what is happening is a good thing. We have obtained deeper and deeper insights into a immensely rich and arresting world. Much human suffering has become eliminated. Many have been freed from heavy and inhuman kinds of work. The problem, it is thought, is just to spread the fruits of the advancements over ever wider areas. Geographers with an optimistic inclination perhaps would argue that the benefits of the revolution could become even more rich and tasty if Geography was given the opportunity of stepping in along a still broader front than has been the case so far as a contributor to prediction and planning at high levels of society.

Other people believe that the scientific and technological revolution is now fast becoming dangerous if not evil. Nature is being filled with indigestible products, mineral and energy resources are depleted, and plants and animals are being killed off at a rate that nobody has clearly grasped. And nothing is as dead as an extinct species. Science and technology has also helped the armed forces of the big nations to develop weapons of a type and quantity which are effective enough to threaten our own kind. Geographers of a pessimistic inclination might well have ground for making a case for the use of Geography as a helper to prevent things from going helplessly wrong.

Already in the forties John von Neumann foresaw that the planet Earth was soon going to become too small for many human undertakings. Today it is obvious also to less imaginative people how totally dominant the humans and their doings have become

with respect to the future of life around us. The direction of future events will be strongly influenced by human actions.

There is some truth in both the optimistic and pessimistic view of the scientific and technological revolution. From almost every step forward there are good things to gain and bad things to fear. But we know so little about how to judge the wider consequences of this or that choice and we have no experience in the art of being responsible for the overwhelming task of handling the future of a planet. And finally, it is so easy and so unrealistic to say "we" as if events were guided by some sort of common global consensus.

Some critics of the scientific and technological revolution seem to suggest that we should write off knowledge and dismantle technologies in order to find the way back to a lost, more idyllic world. Cases exist where this could be a good idea. But on the whole, science, technology and human culture are so strongly intertwined and so fundamental as a supportive system for our survival that we have no other choice than going ahead. But in doing so we must now consider if there are not several possible directions to take and many different paths to follow in each direction. Therefore, after all, still more knowledge is essential, perhaps also knowledge of a geographic nature and still more diffusion of understanding.

At this point we cannot postpone the question: how can we as geographers, best contribute? An inquiry would provide many differing answers. But perhaps I am right when I guess that a majority of colleagues would stress that our efforts ought to be of an integrative nature. We should try, as it were, to take home to a common center knowledge provided by the specialized disciplines and by our own subfields. This view is not exclusively held by geographers themselves but also by friends in neighbouring fields. Listen, for example, to what F. R. Fosberg, the Smithsonian botanist, said in a recent article: "The important consideration is the role of geography as the integrator of this diverse plethora of information to make it possible to view the earth, or any large part of it, or any major aspect of it, as a whole. This we must insist on, not just as a feature and justification of geography, but in the long run, as a sine-qua-non for the continued tenure of the human race, at least as we know it, on the earth." (*Ann. Assoc. Am. Geographers*, March 1976, p. 120).

To take the integrative task seriously means not only to combine observations of settlement morphology, population structure, social differentiation, location of industry and flows of transportation as we do in urban or regional development studies. It means not only to combine observations of landforms, soils, hydrology, climate and vegetation as we do in studies of natural landscapes. It means also—and that part of the task becomes more and more important—to restore the links and reestablish a balance between the biophysical and the human branches of geography which are now mostly carrying on their business widely separated from each other. A particularly serious side of the situation is the almost total disappearance—at least in the West—of biogeography as a subfield within the geography departments. Geography has lost much precious time by letting this separation happen.

The difficulty in overcoming this rift are great. At the very base they are conceptual. On both sides we have become so impressed by our neighbouring systematic disciplines—all the way from geology to economics—that we have neglected to develop and cultivate a common core of concepts, more suitable for the integrative task than what the borrowed ways of thinking are able to provide. Let me now concentrate attention to this very matter and expose some ideas about how to approach it.

My teacher in Geography, Helge Nelson, who had competence in geomorphology as well as in demography, once told me the story of how he had tried to explain his conception of geography to a businessman friend. They had their conversation in a high office building at the Swedish side of Öresund. Helge Nelson led his inquirer up to the window from which one could see the glittering water with an abundance of ships, the abrasion slopes of Tycho Brahe's island Ven, farmlands and beech woods on both coasts, people moving on the streets below, the towers and chimneys of Copenhagen and the summer-clouds over Denmark. Professor Nelson swung his arm across the scene and exclaimed: "This is what we study". And he did not mean bit by bit but all at once. The businessman shook his head at such a crazy statement and so did I and my fellow students when we heard the story. How could anybody believe that a mix of this kind was a respectable object for scholarly efforts? A task for novelists and painters, perhaps, but not for serious academic work. And so we turned our attention towards more

limited categories and more easily definable perspectives.

And yet, today, when a bridge perhaps is going to be built across just this piece of water, public opinion is beginning to ask questions such as: "What will the consequences in the area be for water currents and erosion, for shipping, for industrial and recreational land-use, for population development, for the streams of traffic, for pollution and levels of noise?" In short, one is curious about, and sometimes anxious for, how the transportation shock will influence the total development of just that piece of landscape which forty years ago seemed to be nothing more than a picturesque scenery.

This much is certain. Landscapes or regions with their total content of connected natural and societal phenomena are again coming up on the agenda, if not for other reasons than the practical ones. Human undertakings have reached such a large scale and begun to encroach so visibly upon Nature and collective social life that landscape evolution as a whole-sale problem is beginning to force itself unto the political arena. Decision-makers are looking around for experts who are willing to provide broad assessments of alternative courses of action.

The problematic situation is in itself to a large degree a result of the ways in which science and technology have come to be developed and applied. Science picks out phenomena bit by bit and studies them under highly idealized and artificial assumptions. Technology combines the findings bit by bit into new constructions and procedures and these are then put back into the landscape mosaic as if contexts did not matter. Bureaucracies aggravate this problem by not only ignoring context, but by artificially creating new fences, new containers, to which the real world has to adjust.

When uncertainties eventually pile up and conflicts arise the solution closest at hand for scientists, technologists and administrators is to call in cross-disciplinary teams. But it is well known that guiding principles for the required integration of knowledge do not easily come forth from such teams. Nor can this be really expected since the members have their hearts and experiences in their own bit-by-bit segments of learning.

Is the understanding of landscapes or bounded regions as wholes only a matter of interest to ad hoc teams and practical planners? I do not think so. On the contrary I do believe that the study in depth of

the very "togetherness" of phenomena in space and time is the one which we must consider. It is in this togetherness that we can find the very source of first principles of a significance which reaches far beyond regional investigations per se. I do believe that there are discoveries to be made which would yield a profound and refreshing influence on our general view of the world and on the whole conduction of research and use of knowledge.

Let me now briefly give some further motivations for why I think such studies might be rewarding, in what direction they should proceed, and to what kinds of insights they might lead us. Science, as it is conceived today, almost entirely looks away from the fact that in the real world phenomena are *locally connected*, to use an expression coined by Olavi Granö. This circumstance leads to structural patterns and outcomes of processes which can seldom be derived from the laws of science as these are formulated today. Let me take an example which has recently been reported.

Two biologists found by experiment that a particular kind of fish developed cancer when a certain chemical compound was diluted in the aquarium water where the fish was kept. However, in open waters where the same chemical compound was present to a similar degree as in the experimental situation, the fish did not show any sign of cancer. In other words, something happened or was prevented from happening under natural conditions which invalidated the simple cause-effect deduction. Our researchers concluded that the affected individuals fell victims to predators at some stage before a cancer was manifest. Other explanations might be possible, perhaps even that different situations in different waters could give the same result. In other words, locally connected phenomena in the real world switched off the process from the course predicted by experiment.

Local connections undoubtedly play a very significant role for what is happening in Nature, in Society and in these two realms when seen in interaction. But as soon as we begin to view things in terms of their local connections then we must go further and realize that any configuration of local connections is in itself locally connected to other configurations. Indeed the surface of the whole earth and perhaps also phenomena outside it form a synergistic whole where the ingredients touch each other shoulder by shoulder as it were. If one stirs in the mixture somewhere the whirls inevitably move outwards and re-

arrange things so that preexisting local connections become transformed into new ones.

All this is, of course, familiar ground for any geographer even if I may be presenting it in new words. The crucial problem is not so much the recipe or metaphor to describe local connections but to find ways of dealing with them conceptually. It should be clear by now that when I suggest that we have to go back to the study of landscapes or regions as wholes I do not exactly mean a revival of traditional regional geography. Nor do I criticize what has been achieved by the workers of that tradition. There is much to learn from them, not the least from their goal-setting, for example the concomitant treatment of Nature and Society. But I would not be faithful to my own background as model-builder if I did not look beyond the tradition. Actually what is at stake here is not in the first place the understanding of unique areas of the world but a deeper insight into the *principles of togetherness* where-ever it occurs. But these principles, as I see it, can only be derived from a careful study of actual individual cases. Such cases need not be of any particular scale, but if I may make a suggestion I believe that the small settings—say the daily range of people—is of crucial importance to look into for revealing insights that can later be applied to wider areas.

More important than the spatial scale is the treatment of process. Togetherness is not just *resting* together. It is also *movement* and *encounter*. By using such very general terms we would be able to look upon Nature and Society under one perspective because what is all the time resting, moving and encountering is not just humans or natural items inbetween themselves but humans, plants, animals and things all at once.

I like to think of any bounded area as a set of "populations" made up of "individuals" who describe continuous trajectories through time—a kind of ballet—from the point in space/time when they come into being unto the point where they become transformed. As individuals I count everything from organisms over tools to stones. A recording eye would see endless permutations going on between the individual entities at an enduring now-line. Permutations would be under the influence of different degrees of inertia. Some combinations, once they have come into being, are enduring and hard to dissolve. Such are rivers and the built structures of cities. Others are fragile and short-lived, say a track in the snow or a bird's nest. The various survival probabilities

pointing into the future make the now-line ravelled and provides a base for a moderate amount of predictability both for the observer and for the inhabitant. Seen from within one could think of the tips of trajectories as sometimes being pushed forward by forces behind and besides and sometimes having eyes looking around and arms reaching out, at every moment asking "what shall I do next? *If things are seen in this perspective we need not look upon Nature and Society as universes apart. Humans and their society is just a pattern in the big tapestry of Nature which history is weaving.*

Described in more conventional terms the tapestry is the outcome of *collateral processes*, in other words processes which cannot unfold freely as in a shielded laboratory but have to accommodate themselves under the pressures and opportunities which follow from their common coexistence in terrestrial space and time. *The study of collateral processes within bounded regions seems to me to be exactly the great challenge we are now facing in Geography.*

Our knowledge of these processes is still slight. In the daily perspective we have just begun to acquire some knowledge of the conflicts between biological rhythmicity and societal time-tabling. At the time-scale of years and decades we find as largely unexplored fields the fundamental question of such relations which are at work when organisms and things come into being and discontinue. These relations must be strongly dependent on local connections in space and time: event *c* cannot happen until events *a* and *b* have happened nearby.

Perhaps the most important findings which a study of collateral processes would provide have to do with *the nature of finitude*. Finitude is not a popular concept in the expansionist tradition most of us have been living. But today some serious discussion is going on concerning the limited amounts of natural resources and environmental capacity. Following the tradition of science to take things out from their contexts, the discussion deals mostly with scarcity and finitude in gross aggregated terms and with an arbitrary selection of items. If one tried instead to see events in their full locational connections I am sure that one would find how finitude is a very finely grained circumstance or characteristic, which is one of Nature's fundamental devices for giving shape to the world, in fact even the social. I am sure that the root of many of our technological problems is our ignorance of the more intricate facets of finitude.

It is impossible in a few sentences to demonstrate the ramifications of this perspective. Only some words shall be said about where I believe that observations have to start.

First of all, every thing, living or non-living, occupies space while at rest as well as while moving. And the space-occupation is to a large extent exclusive. Phenomena push each other aside according to a multitude of power-relations which in themselves form a vast area for investigation. Space-occupation therefore gives rise to spread-out spatial distributions and these in their turn to time-use for covering distances. Limits on time make nearness essential. Secondly, time may also be "exclusively" occupied. If some entity is going to join two different groupings at different locations it must be with the one first and with the other secondly. Waiting occurs. Now, many processes are made up of a ballet of groupings and regroupings of entities in some necessary succession. This applies as well to the rearing of off-spring as to the fabrication of houses and cars. The finitude of space and time within the local configuration causes delays, distortions or extinction of processes. Seen in this perspective the world seems like a garden where a thousand seeds give rise to only a hundred flowers.

If this world-view sounds pessimistic it should be remembered that there are positive things to learn from it. Insights in the finitudes that meet collateral processes could become a challenge which invites creativity and flexibility. An understanding of the finely grained pattern of finitudes could reveal untapped possibilities. I am quite sure for example, that scientific research of the ordinary systematic kind would be able to find entirely new tasks when confronted with the new kinds of questions. And perhaps still more important today: a new base could be laid for the administration of both natural and societal matters in less rigid forms than presently.

By this I come to my final remarks. I see the future as emerging within the togetherness from competition or cooperation, as the case may be, between process patterns, natural and man-created, of which there can only exist a limited amount simultaneously. A selection has to take place. And selection is the crucial point when we consider interaction between Society and Nature (and for that matter also when we deal with the distribution of life-qualities within human populations). How much should be consciously (and simplistically) planned and how much

should be left to the actors who are in direct touch with the wealth of phenomena with which they are together? As long as we had a weak science and technology and, perhaps most important, a low transportation capability, the unfolding of human processes was attuned to a better balanced dialogue between Nature and Society. But today, at the crest of the scientific and technological revolution, Nature is in many respects becoming the weaker stage-partner. Its interests have to be protected by understanding and concern.

Something has happened which makes it more urgent than ever to keep a close eye on how the locally woven togetherness fares from place to place. The problem is the tremendously increasing influence of decisions and activities at a distance out of local sight. In a simply arranged local economy of farm, village, workshop and market-place, local actors have reasonably complete grasp of the relevant collateral processes and can guide them or adjust them rather intuitively. This high degree of information does not exclude conflicts, but the parties in these must be assumed to have a good degree of knowledge about the material background of their opposing standpoints. In a highly developed industrial economy, on the other hand, the various production tasks are each so small and geographically so spread out that the total picture becomes lost. There exist cases such as when the cutting of flowers on fields in Africa are managed by a computer in Copenhagen. This means that time still counts but space not. It is clever, but is it sound? It is easy for the computer to reach Africa but the local conditions must be reported back in a highly summarized fashion. In other words, the local togetherness is not taken into account. If expansion goes on like this, can we finally understand and deal with collateral processes where the lateral scale has grown over the whole globe? It seems to me to entail far too great a discrepancy between the still limited ways of Nature and the technologically expanded ones of Society. For we must remember that even if the parts of a project are dealt with far apart the whole is still operating under inescapable conditions of space/time finitudes. And sooner or later they will make themselves felt, perhaps in uncomfortable ways.

What seems to be particularly dangerous in the present situation is that the human imagination, at least as it has become trained in our developed countries, does not appear to be prepared to grasp finitudes intuitively. To take an example close at

hand, I guess that every researcher has found that he tends to promise to write more papers than his time later on allows him to do. And the lesson is never learned. It is, by the way, frequently a good idea to think about one's own experience before one is making general statements about the world. Then I think that we could agree that it is very easy to dream up blue-prints for new undertakings but very hard to imagine their fate and their consequences for other legitimate processes when put into practice. Perhaps the trouble is that thought does not encounter in its own world the constraints of space

and time. Thought moves unhindered from place to place and from time to time. And so these dimensions remain unreal to the mind until eventually the world itself makes them severe. But that can take a dangerously long time at least where Nature's processes are concerned. Therefore they need to be understood on theoretical grounds.

I see a central task for Geography to investigate carefully the workings of collateral processes under the perspective of all thing's togetherness and to use its insights to teach the lessons of finitude.