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Human Genes and the Natural World

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As the ongoing debate about the proper relationship of the earth's peoples to the natural world heats up, recent studies on evolution are casting a new and perhaps critically important light on the subject.

Several years ago the biologist Rene Dubos hazarded the guess that in view of the length of time we humans have spent in hunter-gatherer societies, we could well have acquired a heritable biological need to live in groups. Our need for community, in other words, could be encoded into our genes. Little attention was paid to Dubos' idea during his lifetime, but now comes professor V.C. Wynne-Edwards with a 30-year study of the British red grouse which suggests that we should take a closer look at that idea. Wynne-Edwards has revealed a remarkably complex gene-instructed behaviour pattern in the grouse. Instead of the ruthless pursuit of self advantage by the most potent individuals which current Neo Darwinism posits, he finds they are

> cooperators that compete with their rivals under set rules and accept the result as binding. Their regime depends on coercing individuals to behave as they do in the interests of posterity...traits that increase the viability of groups in their pursuit of immortality are bound in the long run to take priority over those that merely increase the self advantage of individuals..1.

Implying a possible human relevance for this discovery, Wynne-Edwards notes that, "It is a well established fact that many adaptations closely parallel to those of the red grouse exist not only in other birds but widely in the rest of the animal kingdom." If we accept hominids as offshoots of the animal kingdom, the possible significance of such gene relationships to *Homo sapiens* becomes clear. Indeed, if one wishes to push human origins back into the remote simian past it is worth remembering that chimpanzees, too, have been encoded to live in groups, and geneticists estimate that more than 98 percent of the gene makeup of humans is identical with that of the chimpanzees.

It seems logical to speculate, then, that a built-in need for community was passed down through the hominid chain to the hunter gatherers, and that the latter's mode of life added strength to the gene promptings. Certainly, the length of time during which prehistoric humans lived in groups lends cogency to Dubos' notion; for as Robert Prescott once pointed out, "of the estimated 80 billion people who have ever lived out a lifespan on earth over ninety percent have lived as hunter gatherers.

If in fact human genes are active in the way suggested here, two vital questions must be raised: *Is the maintenance of close group ties essential to the social and mental wellbeing of humans and, if so, how large can a group grow before the invisible ties between its*

members become so attenuated that for all practical purposes they cease to operate, with consequent dysfunctions setting in?

If we examine the available data and make certain suppositions about the course of human history, some answers suggest themselves. One assumption is that the life patterns of the hunter gatherers must have been guided by group instinct to a large extent, with the conscious intellect playing a lesser role. But when, some 8,000 years ago, the hunters gave up nomadic life to settle in agriculture-based villages and small towns, the intellect must have begun to play a far larger role. It had to. The amount of forethought and planning needed to organize village life, to save seed at harvest time for next year's crops, or to prepare for defense against possible marauders, was of a different type of complexity than that known to nomads.

Obviously, too, the larger the village or town, the greater the degree of rational planning needed. What we cannot know as yet is the extent to which the increasing dominance of the intellect subdued and shoved into the background the messages coming from the genes.

Perhaps the data we possess about social health in cities of various sizes can give us some hints. By the time Plato had arrived on the scene, people had begun to ponder about optimum city size. Plato came to the conclusion that the largest practicable population would be around 40,000. In our time a mass of evidence has been assembled which points to a larger figure. In his landmark study *Human Scale*,.2. Kirkpatrick Sale marshalled this evidence and came to the conclusion that the maximum size consistent with social health is around 150,000. Beyond that point, he found, communities began to experience an ever-increasing amount of "fragmentation, deviance, criminality, social stress, alcoholism, mental illness." In their study of human populations Anne and Paul Ehrlich of Stanford University cite an urban stress test which was applied to 192 American cities with populations of over 100,000. The 22 cities with the least stress averaged 116,000 people..3. We know that in cities approaching 100,000 the invisible bond connecting one person to another can still be very much alive. Of England's Sheffield in the 1840s, for example, it was noted that, "over wide areas each person appears to be acquainted with every other, and to be interested in that other's concern.".4. And since one would expect community coherence to improve in even smaller populations, it comes as no surprise to find that cities which by today's standards are tiny have been among the most successful and creative. Thus, Periclean Athens probably had a core of 50,000. Renaissance Florence in the sixteenth century had 40,000, and Rome of that era some 55,000.

Given the increasing problems facing cities as they grow much beyond 150,000, one wonders how today's megacities manage to survive. It is tempting to guess that families brought up amid the crime and stress of a metropolis do, after two or three generations, become etiolated, but that the city is replenished by the continual arrival of healthy stock from provincial centres and farms. Only mass immigrations kept 19th century London from shrinking, so high was the death rate from disease prior to the development of organized sanitation in the 1870s. Then, too, it is evident that in most big cities a certain amount of neighbourhood group coherence developed where people remained somewhat rooted or were ethnically homogeneous. Town planners in London and New York, for example, found that when in the post-war period they masterminded with the best of intentions various slum clearances, they had unwittingly destroyed neighbourhoods which had enjoyed a fair amount of social cohesion, the result was disorientation among the dispossessed slum dwellers. Cohesion has clearly been quite strong for those living in what has sometimes amounted to sub-cities in ethnic enclaves such as those formed by the Irish in Boston, the Chinese in San Francisco, and today's Puerto Rican section of New York. Unfortunately, there are growing signs that as the twentieth century nears its end even these tenuous group relationships are coming unstuck.

While the communical problems posed by sheer urban bigness are obvious enough, it is

the growth of automobile use that threatens to deliver the coup de grace in the developed world. The constant mobility which the internal combustion engine permits has made it increasingly difficult to have settled neighborhoods. We were warned about this many years ago when Lewis Mumford first described the car as the destroyer of cities and neighborhoods. North America was the first continent to produce cars on a mass scale, it has also as a result become the first to experience the social fragmentation which mobility has made inevitable. In Britain, where car ownership has doubled over the last twenty years, similar effects are beginning to be felt not only in big cities but also in the declining stability of village life. During that period the number of family-owned village shops declined from 24,000 to 8,000 simply because car owners prefer driving to distant malls to do their shopping.

But it is in North America where matters are reaching crisis proportions as urban disintegration grows. As Joan Didion wrote recently of New York, "by April, 1990, people who lived in and around New York were expressing, in interviews with The Times, considerable anguish and fear...people feel a sense of impending doom about what may happen to them; a clinical psychologist said, 'people feel trapped, angry, terrified and on the verge of panic'. As a headline in the *New York Post* put it, Most Would Get Out Of City Says TIME-CNN POLL.".5. In the United States as a whole, according to Dr. Berry Brazelton, professor emeritus of pediatrics at the Harvard School of Medicine, "Society is breaking down, with children in the poorer communities becoming infected with a sense of self destruction and middle-class families being pushed beyond their capacity to function...the symptoms of social epidemic are evident in every major U.S. city".6. This is confirmation of the findings announced three years earlier by a team from the National Institutes of Mental Health which stated that, "among people born between the war and now, the incidence of common psychiatric disorders is far more widespread than it was with previous generations.".7. Similar symptoms are appearing in Canada where a recent study of 17,000 elementary and secondary schools revealed that, "violence and a growing array of social and behavioral problems is impeding teachers' ability to instruct."

All this is, unfortunately precisely what one would expect in a culture where group coherence is getting thinner by the year, a culture where the average family moves every five years, and where 68 percent of the people do not know who their next-door neighbors are. Like the red grouse, perhaps, humans need to listen to the prompting of their genes, or maybe they will suffer when they fail to do so.

Along with the uncommunal life of the mega- cities and the baneful influence of the automobiles there is a third and perhaps equally alienating factor. This is the loss of contact with the natural world beyond city limits. If the need for group life did indeed become solidly encoded in the genes of hunter gatherers, it is logical to assume that a deep need for intimate contact with surrounding nature could likewise have become encoded. Those people simply had to be in touch with plants, forests, birds, animals, streams and lakes every moment of their waking lives. Their continued existence depended on it.

If such encoding did in fact take place, we ought to be able to find traces of it in the needs of today's humans, difficult though it may be to pin down provable evidence. Here are a few hints.

In a book commissioned by UNESCO, *Growing Up In Cities*, Kevin Lynd of the Massachusetts Institute of Technology described a curious and significant discovery. He found that no matter where children came from in countries as widely dispersed as Argentine, Australia, Poland, and America, "the hunger for trees is outspoken and seemingly universal.".8. Could this be the voice of the genes? In Britain educators have found a striking difference in the behaviour of children whose school recreation areas, consist wholly of concrete or blacktop and those where there were areas set aside for grasses, bushes, and flowers. Children deprived of plants displayed hostile and

destructive behaviour, whereas those who played amid various bits of greenery tended to be well behaved and cooperative. In a vivid passage in his *Conquest Of Happiness* Bernard Russell recalls observing an instance of this inner need for growing things:

> I have seen a boy two years old who had been kept in London, taken to walk for the first time in green country. The season was winter and everything was muddy. To the adult eye there was nothing to cause delight, but in the boy there sprang up a strange ecstasy; he knelt in the wet ground and put his face in the grass and gave utterance to half-articulate cries of delight. The joy that he was experiencing was simple and massive. The organic need that was being satisfied is so profound that those in whom it is starved are seldom completely sane.

If indeed such needs are vital to human wellbeing and even sanity, then virtually all of today's global trends seem designed to prevent their fulfilment. The lemming-like flow from farms and small towns into ever more bloated, sterile and dysfunctional cities seems almost unstoppable. In less than a decade from now half the world's population will live in huge cities, several of which will be harbouring more than twenty million people. This trend has all the earmarks of a prescription for disaster, a disaster which will likely be exacerbated in the not distant future by energy problems. Predicting the future of the world's energy supplies is a chancy business, since technical breakthroughs can alter the general picture at any moment. There are nevertheless some strong probabilities. Thus, there is general agreement among energy experts that if future consumption patterns follow the growth trends of recent decades, global supplies of oil and natural gas will be - exhausted within roughly fifty years or sooner. Renewable substitutes such as solar, wind, geothermal and biomass energy will be different from fossil fuels in two ways: they will lend themselves to decentralization and the energy they will provide will be less abundant. For megacities that will be bad news since they are energy gluttons. Their skyscrapers are the grossest of gluttons. Thus the two towers of New York's World Trade Center and their 9,000 inhabitants consume as much energy as a city of 100,000. Even with today's abundant low-priced fossil energy, New York seems gradually to be losing the battle to keep its infrastructure in tolerable repair. With tens of millions of the world's people locked away in crumbling megacities where greenery is scarce, an optimistic prognosis is hard to take seriously.

A scenario of gloom is not, however, inevitable. Solutions can be envisaged which, though politically impracticable today, might well prove appealing under the spur of mounting crises. Let us put on rose-coloured glasses for the moment and suppose that civic leaders, recognizing that megacities have no tolerable future, decide that they have no alternative but to carve them up into manageable pieces. After providing tax breaks and other inducements for those who want to move to small towns in the region (60% in New York according to one poll), they begin by cutting huge swaths through their city in such a way as to create urban "islands", each of which would contain not more than 150,000 people. These islands would become independent cities, save for a regional council which would handle such unavoidably shared services as arterial roads, water supply, and electronic communications.

The swaths thus cut would be wide. Not only would the buildings on them be removed, but all concreted and blacktopped areas as well. Topsoil would be brought in from outlying districts and spread on the rased areas. On this new soil there would be planted substantial strips of forest and also market gardens. The latter would use, instead of today's chemical-based agriculture, organic methods such as those now being developed by the Land Institute in Kansas and by John Jeavon's Ecology Action group in California, whose techniques can be made to produce anywhere from two to four times the quantity of vegetables yielded by current commercial methods.

The people living in these new human-scale cities would enjoy several advantages. Their

city's size would allow the growth of a coherent community life; through the forest strips and gardens they could re-connect with the natural world; and they would find themselves a fair way along the road to independence from imported food. The latter factor alone might prove critical for their survival, since the world's future food security is by no means assured. As Lester Brown of the worldwatch Institute keeps reminding us, the world's farmers must now try each year to feed 90 million more people on 14 billion fewer tons of topsoil.

Fearsomely difficult though such a rearrangement of big cities might prove for those in the so-called developed world, one would think it almost impossible for people in the megacities of the third world. And yet that is not the case. In cities such as Lima and La Paz people of the underclass have already shown how it can be done. In groups ranging in number from 100 to 500 they have secretly organized exoduses to settle (quite illegally but very successfully) on new sites outside city limits..9.

. In such population shifts we might see a welcome trend toward more viable human-scale communities. It is a sobering fact, however, that at the present time most indicators point in the opposite direction. The rapidly developing technologies of communication promote the globalization of business enterprises while undermining the integrity and security of small communities. The multi-national corporation is loyal to no country, has no ethics beyond those forced on it by public opinion, enjoys at best a tepid loyalty from its employees, and yet because of the favourable terms of electronic internationalism is flourishing. Octopus-like, it sucks the financial juices out of one community and then abandons it to prey on another. A transnational logging company, for example, "mines" an old-growth Vancouver Island forest instead of using sustainable ecoforestry. When all the useful trees have gone it departs blithely to pursue its depredations elsewhere, leaving bankrupt communities in its wake. Or a chain store will settle in a town, set up a price war with local merchants, and try to run them out of business. Its profits will be siphoned off to some distant headquarters. So powerful have many of these behemoths become, that they can influence governmental and international treaties.

Almost everywhere one looks, the proponents of large-scale organization are busy undermining community togetherness and community traditions. Hence, we see the European Economic Community, with its hordes of Brussels bureaucrats, hard at "rationalizing" the ancient Spanish region of Extremadura in an effort to align its food policies and habits with those of northern Europe, destroying in the process a rich, centuries-old tradition

and despoiling a unique landscape which has magnificent wildlife habitats. In their enthusiasm for modernity and their instinctive preference for crude economics over human values, these functionaries and their Spanish abetters seem unaware that Spain will pay an unacceptedly high price in marginalized and disoriented farmers who once enjoyed a close and satisfying community life..10. In the same fashion, the World bank and the International Monetary Fund have with a placid conscience destroyed countless Third World communities by insisting that they produce cash crops for export rather than food for themselves, or that they displace whole communities in order to build monster dams. It should be noted, too, that the underlying intent of the proposed General Agreement on Tariffs and Trade (GATT) is to make the world still safer for multinational companies by overriding local interests when they conflict with global trade rationalization.

Must one conclude from all this that the odds are stacked irrevocably in favour of multinational predators and against the world's chances of preserving whatever meaningful communities it has inherited from the past? Must this so-called rationalism prevail whenever there is a conflict between economic growth and the world's biota?

As governments and their bureaucracies seem to grow less and less responsive to

ordinary citizens' needs and wishes, and as most leaders and economists act as though they have yet to internalize the scientists' message that the world is heading into several ecological crises, a grassroots movement is developing almost everywhere among concerned individuals and groups who see that since big government not controlled by communities is the cause of many problems and not the answer to them, people must work to change things themselves. Hence for example, the more than 500 non-governmental groups who, early in 1992, met in New York to plan their own agenda for the coming summer meeting of governments in Rio de Janeiro. That in the end they had only a modest influence on the proceedings is not the point. The point is that five years ago there would have been half that number of groups in existence. The story in Western Canada is probably typical of what is going on in most areas throughout the industrial world. Ten years ago there existed in British Columbia a bare handful of ecological groups and societies. Today there are more than 250 of them, all determined to look after their particular ecological area. This could prove to be the beginning practice of bioregionalism; that is to say, the growth of local polities controlling specific coherent ecological sections of a country. Nor are these groups merely local. Availing themselves of the same communication techniques that empower multinationals, they network locally, continentally, and globally.

Should large numbers of the broad general public decide to wrest power from the big organizations that are controlling their lives, there are potent avenues open to them. Jeremy Rifkin, .11. for example, has pointed out a key weakness of the multinationals, who depend on access to the tens of billions of dollars salted away in pension funds. *Should the owners of such funds decide to move them out of the monetary mainstream and put them to work in community and ecology-oriented fields, "the international - banking community and the multinational corporations they serve would be reduced to shells having little effective control over global resources and the global market place."* Many of the investors of such funds are in fact now beginning to "think green".

As the validity of the entire paradigm of industrial civilization comes under increasing critical scrutiny, more and more attention is being focused on Ladakh, the little country of 130,000 people whose culture has been a solid success in many areas where Western modes have failed..12.

Set in a harsh and arid land amid Himalayan peaks, this centuries-old culture with its tiny towns and villages has created an extraordinarily rich communal life where public and private property mix inextricably, where crime is virtually nonexistent, where people help each other instinctively, and where a profound respect for the natural world has engendered such a scrupulous use of natural resources that the land is pollution-free. The result is a people with a profound sense of inner security who go about their daily affairs laughing and singing and sparkling with joie de vivre. (At least, that was the case before the opening up of the culture some ten years ago to the various destructive evils of Western industrialism).

The relevance of Ladakh culture to the present paper lies in the possibility that we have there a society which has remained fully in touch with its gene promptings and which, like the hunter gatherers and even Wynne-Edward's grouse, have thereby achieved fully functioning group coherence.

It is also a culture in which women are in no way inferior to men and enjoy a position of enviable respect. This raises the question whether the male- dominated societies of the West can ever overcome their disintegrative tendencies without according women a place equal in all respects to that of men. Beginning in the 16th century, European society, under the drive of disciplined, domineering, risk-taking males, went out to conquer one culture after another—the Americas, India, Southwest Asia, China. The same breed of men and their successors in North America, empowered by fossil fuels, went on to plunder the earth's material resources. The result, though unlucky for many cultures, was

not globally disastrous until the process began to wreak havoc on the earth's ecosystems and to change the gaseous composition of its atmosphere.

Since it is clear that so much energy in the hands of heedless males is a threat to a good deal of life on the planet (including that of the males' descendants) the experiment at least ought to be tried of giving women the major voice in the conduct of affairs. Women's flair for cooperation, together with their natural role as nurturers, should give promise of a less violent, more cooperative society, one which might listen more sensitively to those messages from the genes that are telling us we can only be fully happy in smallish, cooperative polities which pay attention, as the red grouse instinctively do, to the amount which can be taken from the surrounding biota without compromising its sustainability.

Notes

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