THE RATIONAL SOCIETY AND ITS ENEMIES.
Person-islands, human behavior, and the decay of communal *joie de vivre*

LA SOCIEDAD RACIONAL Y SUS ENEMIGOS.
Islas-persona, conducta humana y el desperdicio
de la joie de vivre *comunitaria*

PETER HARZEM[1]
AUBURN UNIVERSITY

ABSTRACT

The serious, probably devastating problems with which all cultures of the world are grappling are discussed, and the question of what sorts of scientific knowledge are needed to resolve these problems is considered. The knowledge now available in the behavioral and social sciences is insufficient, and the kinds of inquiry pursued by those disciplines should be extended. The possibilities of such extensions are examined with reference to areas of knowledge usually considered disparate, including political philosophy, physics, behavioral psychology and sociology, institutional history, and ecology. It is concluded that if we are to save ourselves we must put together any knowledge that is relevant but scattered under different heads.

Key words: Popper, open society, relativism, Gödel's theorems, Penrose, socio-political systems, ecology, Soviet social structure, sciences of behavior.

RESUMEN

Se discuten los problemas causados por una seria devastación en la cual todas las culturas del mundo se han visto inmiscuidas y se pregunta qué clase de

1.   Author note: correspondence should be sent to the author at: Department of Psychology, Auburn University, AL 36849-5214, USA. E-mail: harzepe@auburn.edu

conocimientos científicos son necesarios para resolver estos problemas. El cono-
cimiento ahora disponible en las ciencias sociales y conductuales es insuficiente,
se deben extender las preguntas de investigación que estas disciplinas per-
siguen. Se examinan las posibilidades para estas extensiones se hagan con
referencia en áreas de conocimiento usualmente consideradas ajenas, in-
cluyendo a la filosofía política, la física, la picología conductual y sociología,
historia institucional, y la ecología. Se concluye que para salvarnos debemos unir
cualquier conocimiento que sea relevante aunque se encuentre disperso en
diferentes cabezas.

Palabras clave: Popper, sociedad abierta, teoremas de Gödels, sistemas
socio-políticos de Penrose, ecología, estructura Soviética social, ciencia de la
conducta.

> The conflict between rationalism and irrationalism
> has become the most important intellectual, and
> perhaps even moral, issue of our time.

Karl R. Popper, 1945, 1966[2]

INTRODUCTION: A GLOOMY PICTURE

The issues Sir Karl described in 1945 have now gone beyond being intellectual
and moral issues that are assigned to seemingly esoteric academic debates and
scholarly writings. Insidiously they have come to permeate every aspect of our
daily lives. Our societies, regardless of their political alignment, level of economic
development, religious devotion, and communally held moral convictions, are
hurtling towards oblivion. In the mean time the essential problems that are
challenging the survival of our cultures are casually discussed in popular presses
and television shows, and in that vein they are put into the service of political self
interest. By now they have become so often heard that they no longer attract more
than a passing interest. Some of us humans are rapt in such poverty that we have
no time or energy to be concerned with anything beyond daily survival. Others of
us are busy in endless search for wealth, to obtain the personal pleasures that are
offered to us in tempting abundance; and those offering them are also captives of
that search so that they, too, can pursue the illusory pleasures which they
themselves had manufactured to market. A poet once observed. "What strange
creatures are men; they create their own gods, and they themselves worship
them" (Tevfik Fikret, 1914).[3] The observation remains true with the exception that

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2.   Karl R. Popper (1962) *The open society and its enemies.* Princeton, NJ: Princeton University Press,
      1971 reprinting, p., 224.

3.   Tevfik Fikret was Turkish poet, much concerned with social reform and the improvement of living
      conditions for the average person. His book of poetry containing the poem quoted here is titled

we have now replaced the worship with incessant pursuit of an illusion. We have collectively become like Nero, playing the fiddle while Rome burned.

'A society that does not care for its posterity is doomed to extinction'.[4] There has never been a time in history when caring for posterity was as vitally important as it is now. This is because the technologies we have developed in the 20th century have magnified the consequences of uncaring beyond imagination. When asked, many a parent will say that they care about what kind of society their children will live in, what kind of people they will have to work amongst, be friends with, and neighbors of. But when also asked what they are willing to contribute to ensuring a good future for the society, few among those who have the resources are prepared to devote more than what taxes take from them; on the other hand the percentage of the poor in the population is growing, and they do not have any resources to contribute to such a cause even if they wished. Consequently we are unable safely to discard poisonous waste, yet unable to stop producing it; we are unable to stop greedily taking from our natural environment though we cannot replace what we take; we have made our personal environment unsafe, prone to violence, theft, rape, and the like so that we are unable to trust each other. In almost every society, the gap between the wealthy and the poor is widening, as is the gap between the wealthy and the poor societies.

If this picture is true, or even if it is only half-true, it calls for all efforts possible to change the course on which humanity is set. But what can be done?

Recommendations and suggestions that seek to answer this question pour in abundance from political parties, economic theorists, behavior analysts, social reformers, religious evangelists, and others of innumerable varieties of convictions. These recommendations fall into two groups, related but with different focus: those about how to find personal content, and those about how to save the society at large. They are often contradictory within and across the two groups of recommendations, and there are no unbiased criteria to choose from amongst them.

There are many reasons for this state of affairs, but there is a root cause that calls for urgent attention. Any sound knowledge that may already exist on which solutions may be based consists of scattered information. In this age of specialization we are unable to put together what is available in the various fields of inquiry that we have placed in different pigeon holes. The trees get in the way of our seeing the forest.

This paper is concerned with the question of what knowledge we now have that can be used to divert our societies from the course in which they seem to be set. It attempts to relate some of the presently available information, both empirical and conceptual. There is, however, no claim to completeness; rather the

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Sermin. It was published in Istanbul by a press that not longer exists.

4.   This was said by B. F. Skinner in a personal conversation. I made a note of it soon after our meeting.

paper is, at best, a first, tentative step towards a comprehensive combination of knowledge.

Of course there are at least two further questions that must be addressed: What else must we know? and, even if we were to know enough at least to arrive at some solutions, is it possible for our present behavior to change so as to put such solutions into effect? These questions, although important, are beyond the scope of the present paper, and will be only briefly touched upon.

KARL POPPER AND THE RATIONAL SOCIETY

Karl Popper's influential book, *The open society and its enemies*, after which the present paper is titled, was published in 1945. That was in the early years of the time of confrontation between Stalin's Soviet block and the rather more loose block of capitalist and semi-capitalist[5] countries. The battle, as seen at the time, was between 'social engineering',— a term coined by Popper[6] to describe Marx's proposition for the communal[7] society, and the kind of society which has no pre-planned rigid goals but which emerges from the individual choices and preferences of its people; namely, the open society preferred by Popper.

At the time the ideological, and occasionally the armed, conflict between the supporters of these two positions was all-consuming on both sides, in intellectual discourse (at least in the open societies where such discussion was permitted) and in political decision-making. Both sides devoted enormous proportions of their available wealth to arming so as to defend themselves from the other side, in the process impoverishing the living conditions of their respective peoples; and many individual lives were ruined on suspicion that they held seditious beliefs, that is to say, beliefs that were in accord with the opposite side. We know now that this caused far greater horrors on the Soviet side.

In this context Popper's philosophical book attracted great attention, beyond the academia. It was seen as the decisive argument against the Marxist position, and Popper acquired the reputation of having 'buried Marxism'. In the light of the international events since Popper's time, it may well be argued that his position did contribute to the apparent demise of the Soviet Union. There is, however, a fundamental distinction between the Soviet system as it existed and the Marxist ideas on which it was claimed to be based. Recent Marxist writers have argued that what was abolished was the particular Soviet system and not Marxism. Burgess, for example, has written 'despite the fall of the USSR, and despite the

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5.   Sometimes referred to a 'mixed-economy'.
6.   B. F. Skinner, who wrote *Walden two* and his followers who at various times thereafter attempted to establish communities modeled after the one described in that novel, seem to have overlooked the origins of the notion of social engineering.
7.   The term 'communist' has acquired many, mostly negative, connotations that are not part of the present discussion. For this reason, I use 'communal' instead.

organized working class being in an appalling condition, anybody persuaded away from Marxism by Popper was never really a Marxist in the first place' (1996, p. 8). The evidence is abundant that the Soviet system was corrupt. It had usurped Marxist theory for the private purposes of the clique that ruled it. In that regard the history of the Soviet communism parallels a longer but limited period in the history of Christianity when corrupt papacies usurped its influence for their own pleasures. This observation, and many other examples of the same kind that can be found in human affairs, past and present, raises fundamental questions about the conditions that determine the decisions of individuals who have power enough to control resources, whether at a minor level, say policeman or tax collector, or at a higher level, say political leader of a country and his or her entourage. These are questions that are particularly suited for behavioral inquiry, and they will be discussed below.

The criticism of Popper's work on the grounds that the Soviet regime was not in fact Marxist misses, however, his two most important points: first, Popper's critique was of Marxism and not of the society purporting to be Marxist; and second, Popper's theories have another part that is significant constructive concerning the conditions under which the good society would be possible.

It is sometimes argued that Popper's view is mistaken because even though the open societies won, the social systems of the post-Soviet era are no better than the systems against which Marx wrote; and further, that the seemingly victorious societies have features which might count as evidence supporting Marx's position. Perhaps the most telling amongst these features is the growing concentration of wealth—Marx would say 'capital'—in ever fewer hands. This, however, is a tendency Popper also foresaw. It is, he thought, a characteristic of "unrestrained" capitalist systems. The present trends in the post Soviet era provide persuasive evidence in support that assertion. Popper thought that a rational society would develop ways to constrain that tendency. Whether such will be the case still remains to be seen. In the mean time, however, none of our societies is the kind of open society Popper envisaged. Just as it is true that the Soviet system was not what Marx prescribed, the present capitalist systems in the more wealthy and powerful countries are not what Popper recommended.

Popper's book might equally well have been titled 'the rational society...' because he thought that the good society could only be achieved by rational decision and reasoned effort. His concern was, however, with the question of the kind of rationality that may shape the open society, and concluded that '*comprehensive*[8] *rationalism is untenable*' (Popper, 1966, Vol. 2, p. 230, my italics). This is because, he wrote,

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8. Popper also uses the term 'uncritical rationalism' which is interchangeable with 'comprehensive rationalism'. See, for example, 1966, p. 229.

> The rationalist attitude is characterized by the importance it attaches to *argument* and *experience*. But neither logical argument nor experience can establish the rationalist attitude; for only those who are ready to consider argument or experience, and who have therefore adopted this attitude already, will be impressed by them... no rational argument will have an effect on a man who does not want to adopt a rational attitude (1966, Vol 2, pp.230-231).

Thus, the kind of system proposed by Marx—and other political theorists—while rationalist, is faulty on rational grounds.

> ...Whoever adopts the rationalist attitude does so because he has adopted, consciously or unconsciously, some proposal, or decision, or belief, or behavior; an adoption which may be called "irrational". Whether this adoption is tentative or leads to settled habit, we may describe it as an irrational *faith* in reason. So, rationalism is far from comprehensive or self-contained (1966, Vol 2, p. 231, my italics).

This is not, however, rejection of rationalism in any form. The rejected comprehensive or uncritical rationalism is replaced by Popper's critical rationalism. Critical rationalism is the arriving at decisions by reason, but moderated by ethics, and the recognition that 'we may err'[9] (1966, Vol. 2, p. 375).

Popper wrote

> ...what impressed me most was Einstein's own clear statement that he would regard his theory as untenable if it should fails certain tests... Here was an attitude utterly different from the dogmatic attitude of Marx, Freud, Adler, and even more so of their followers'[10] (1966, Vol 2, p. 26).

On this showing, perhaps ironically, 'comprehensive—or uncritical—rationalism' (another term might be 'unconstrained rationalism') emerges as an enemy of the rational society. By its means '...the attempt to make heaven on earth invariably produces hell. It leads to intolerance' (1966, Vol 2, p. 237).

Critical rationalism is not to be mistaken, however, with 'intellectual irresponsibility of a mysticism which escapes into dreams and of an oracular philosophy which escapes into verbiage...' (1966, p.243). This is *relativism* which is as weighty an enemy of the rational society as is uncritical rationalism. In the addendum to the fifth edition of *The open society and its enemies* Popper wrote

> The main philosophical malady of our time is an intellectual and moral relativism, the latter being at least in part based on the former. By relativism-or, if you like, skepticism—I mean here, briefly, the theory that choice between competing theories is

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9. This view is sometimes labeled Popper's 'fallibilism' that is, the recognition of and being open to the possibility that we may be wrong.

10. In this light one may now reflect on the attitudes of many of Skinner's followers.

arbitrary; since either there is no such thing as objective truth; or, if there is, there is no such thing as a theory which is true or at any rate (though perhaps not true) nearer to the truth than another theory; or, if there are two or more theories, there are no ways or means of deciding whether one of them is better than another (1966, p. 369).

Thus, the rational society has two main enemies which are at two extreme from each other: (i) comprehensive (uncritical) rationalism, which is best described as blind adherence to dictates of reason regardless of needs, wishes, hopes, compassion, and the like; and (ii) relativism, which devalues moral and intellectual judgment in favor of irrational considerations.

These two are at the root of the main problems of our times, and the main threats to the survival prospects of our cultures. They especially and intimately concern, therefore, the behavioral sciences.

TOWARDS A SCIENCE OF NON-COMPUTABLE THINKING

Having struggled to establish itself as a Science—with capital S—the concept of critical rationalism would seem alien to academic psychology. This is especially so to behaviorist psychology, remembering that the first sentence of the work with which its founder introduced behaviorism was 'Psychology is that division of natural science which takes human activity and conduct as its subject matter' (Watson, 1919). Science, moreover, is that endeavor which takes nothing but empirically confirmed observations and rational statements based on them. From its inception to the present this position has been the strength of the science of behavior, but also its weakness.

From Watson onwards, behaviorist thinkers traditionally have been concerned that their science contribute to the betterment of the human condition. However, in that regard the problem for behavior science in general, and for *behavior analysis*, (i.e. Skinnerian psychology) in particular has been that of selecting what is good, what is moral, what is the best course of action for a society, and the eternal problem of the distribution of goods and capital. Even given that techniques for the detailed control of human behavior are known, how will it be decided, by whom, which kinds of behavior will be reinforced and which not? That was the Achilles heel of the plan for utopian society described by Skinner in *Walden two* (1976). That plan was what Popper termed 'social engineering' with specific reference to Marx's proposition, and many critics have commented that the fictional Weldon two community would be, for them, hell on earth—as Popper had observed about the Marxist and other engineered societies in general. The strenuous objections to designing the society by the use of scientific knowledge seem all to arise from a basic aversion to rigid control, although the critics overlook that, our lives are in fact profoundly affected by scientific discovery, through the technologies that are developed from them. The question, then, is not

whether science will control our lives; whether we wish it or not, it does. It is whether we will use the science well. To take just one example, nuclear energy which can be put to both good and bad uses, is used more to produce horrendous weapons than to detecting and curing diseases.

Is there a way to improve upon this state of affairs, and consistently and exclusively to direct scientific knowledge for the social good, and how shall we unarguably know what is social good? One novel way of posing these questions is, can we develop a science to control science, or, to state this in yet another way, can we scientifically discover the roots from which values, moral judgments, and seemingly non-rational wants arise?

Seeds of the possibility of a 'yes' to this question can be found in the converging of ideas from quite disparate sources. One source is Popper's idea of critical rationalism. This leaves open, however, the issue of how to arbitrate between values. Another source is Gödel's two theorems which are also known as 'incompleteness' theorems. These theorems logically prove that (i) in each formal theory there are sentences that can be derived which cannot be proved in terms if that theory, and (ii) each theory entails a sentence which 'expresses' the consistency of the theory which also cannot be proved. Every theory, then, has components that do not rest on logical proof but are nevertheless supported—or propped up—by the other statements of the theory. We may consider the *extra-rational*[11] part of critical rationalism as the non-provable yet inevitable parts of theories, as shown by Gödel's theorems.

Another significantly relevant idea comes from Physics. In 1989 Roger Penrose described a theory (he prefers to call it point of view) about the particular nature of the physics that may give rise to thinking, and more generally, to mind or consciousness. (Also see Penrose,1994) The proposition was that part of the processes of the brain may not be algorithmic, that is to say not replicable by computer simulation and not logical if the term logical is confined to algorithmic processes of, for example, any computer. The point is not trivial in that it is not confined to computers now available. It is a stronger assertion that some processes of the brain are non-computable. These process entail physical processes not yet understood. As Roger Penrose expresses it, they lie in a no-man's land between quantum and classical physics; that is to say, there is a gap in our present knowledge of physics. 'My reasoning...represents a genuine search for a means, within the constraints of the hard facts science, whereby a scientifically describable brain might be able to make use of subtle and largely unknown physical principles in order to perform the needed non-computational functions' (Penrose, 1994, p. v). This promises a convergence of the sorts of views, conjectures, and discoveries in a new science which would be neither hard nor

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11. This term captures better, I believe, the part of critical rationalism that cannot be contained in comprehensive rationalism.

soft, one merging into the other. And it offers the possibility of a scientifically founded critical rationality.

With regard to level of analysis, theory and research in Physics are at one end of a continuum of the sciences that may offer knowledge about human action.[12] At the other end of that continuum is the science of human behavior. Discoveries at the level of physics are not, of course, always relevant to the science of human behavior, just as particle physics is not necessary knowledge for the person who builds furniture or creates sculpture, even though it does in part account for the behavior of wood and marble. On the other hand, as Penrose has argued, 'real progress cannot be made into the deep philosophical issues raised by the question of "mind" without a genuine appreciation of the physical (and mathematical) principles underlying the actual behavior of the universe in which we find ourselves' (1996, Vol 2, , p.2). Prospect of a 'genuine' or empirically and philosophically sound science of human behavior (or human nature) is best approached from both ends of that continuum of levels of analysis. With this perspective, I now turn to consider some aspects of the science of behavior.

HUMAN BEHAVIOR AND THE CONCEPT OF CONTINGENCY

The science of behavior, in its present stage of development, is far more advanced than its critics would admit, and far less advanced than its practitioners would claim. The fundamental basis of knowledge in the science of behavior is the discovery of the power and ubiquity of 'contingency', that is to say the role of the consequences of behavior in determining patterns of action. The principle in this observation is no new discovery. We have known, of course, for millennia the power of rewards and punishments in affecting human behavior. Skinner's genius was in seeing its scientific significance, and with that start beginning to build a soundly based science of behavior (see, for example, 1938 and 1953.) However, that science has not yet developed in directions that can provide critical-rational solutions to the issues of society discussed here. On the one hand, the scientific research has been limited to the study of simple acts repeated in large numbers over long periods, mostly—but not exclusively in animal experiments; on the other hand, the attempts at practical application have remained confined to limited populations of specific groups, and to basic principles known decades previously rather than any new discovery. No doubt there are many complex reasons for this state of affairs. However, one amongst them is particularly relevant in the context of the present discussion. This is that the science of behavior has developed as

12. I include here all terms such as 'thinking', 'mind', 'consciousness', and the alike. All such terms overlap with certain usages. The phenomenon to be included will, perhaps, be better isolated one day in the light of scientific discovery.

an 'experimental' science[13] with great importance given to experimental evidence.[14] This seriously neglects, however, a decisive fact that bear on the progress of sciences: Some sciences cannot experimentally manipulate their subject of inquiry. This was true of the most advanced of the sciences from the ancient times to the twentieth century, namely astronomy; and in our time it is largely true of the human sciences such as Economics, Sociology, Human Anatomy and Physiology, and indeed, most of the medical sciences.[15] These sciences conduct most of their investigations in two ways: by using surrogate models, and by non-experimental observation. Behavior science has used various species of animals as surrogate models, but it has largely neglected scientific, non-experimental observation.

There is no way, so far as is known at present, experimentally to investigate the role of contingent relations as they affect human social phenomena. But there are abundant possibilities for scientific observation of social phenomena[16] that can most persuasively be explained in terms of contingencies. The following is just one example of those sorts of phenomena which call for analysis in terms of contingency relations.

One of the mysteries of human history is how one individual, or a small group of individuals, can come to control large populations, and persuade large numbers of people to commit horrendous acts of cruelty that they would not, perhaps could not, in other circumstances.[17] Outstanding examples from the twentieth century are the events that occurred in the Nazi Germany and the Soviet Union, especially under Stalin. Many millions of people were tortured and killed, under conditions of unspeakable cruelty. It can be shown that merely seeing such acts severely distress an average human. How, then, were members of the same species made to commit those horrors?

Numerous explanations have, of course, been offered in the past but of necessity they have been mostly speculative. Perhaps for the first time in history, we now have access to extensive records that show empirically—but not experimentally—at least one set of conditions under which such aberrant behavior does

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13. Its original name was 'the experimental analysis of behavior? and its major scholarly journal is titled *Journal of the Experimental Analysis of Behavior.*

14. In a personal conversation Skinner told me about the time when the first Russian sputnik was put in space, and it circled the earth giving a beep-beep sound. The Boston newspapers published time tables showing when it would pass over Boston environs and could be seen with the naked eye. That night Skinner got his family up to go out to see the sputnik, and they did. Then they returned in, and he went to his study and wrote in his diary 'at last, Copernicus experimentally proved'.

15. Each of these sciences do conduct some direct experiments, but only to a very limited extent, and only on a small selection of the phenomena they investigate. We may note, for example, that the cancerous effect of cigarette smoking has never been experimentally investigated except on animals, but the evidence is undeniable except by those overwhelmed by extreme self-interest.

16. I include in the term 'social phenomena' matters studied by Economics, Political Science, Cultural Anthropology, and the alike.

17. We know that the population will behave in quite civilized ways when the prevailing political regime or the economic conditions change.

occur. These are the records of the Soviet Union which, due to the particular way the Soviet Union broke up, were left intact[18] and gradually made accessible to scholars. (See, for example, Getty and Naumov, 2000).

The system which made the Soviet terror possible[19] consisted of a complex hierarchy of contingencies, established gradually through a succession of stages. The terror began slowly, with a small group of individuals who ardently believed that communal good was paramount over any individual consideration.[20] This made it seem rationally just to eliminate those whose acts and opinions were judged to be dangerous to the communal good: they saw the new society they wished to build as a sapling, vulnerable to attacks from those holding different views. This established the practice of eliminating disagreement, and gradually extended to eliminating anything that stood in the way of 'progress'. This is not, however, sufficient to control the behavior of the whole, in this case enormous, population. Other contingencies must sustain necessary and required behavior. As the power of the central government spread, regional leaders were given absolute power over their own domain—provided, of course, that their own behavior did not contravene the contingencies operating on their behavior. In this way, a multi-tiered system of contingencies emerged. At every level, from party bosses, mayors, factory supervisors to the most junior NKVD[21] officer, some individuals had personal privileges, and power over others. Their actions in the context of those privileges were reinforced, and such behavior replaced behavior that, although just or honest or loath to participate in cruelty, may remove them from their established context of reinforcement. Further, the prospect of such a loss-losing social position, power, authority, livelihood, family, home, etc.-produced yet another contingency: behavior that is reinforced by the removal of any threat to the status of the individual. This, combined with the absence of any contingency that might curtail such behavior, resulted in acts such as denouncing rivals as enemies of the state, and removing people from their positions and replacing them with compliant individuals regardless of their competence. In the latter case the result was that the contingencies shifted from reinforcement of efficient job performance to reinforcement of servile behavior to superiors. This, by the way, substantially contributed to the decline of the Soviet system. In short the complex of contingencies resulted in a social system where each regional boss unquestionably ruled over a network of lesser bosses, each supporting the one level up because if that level fell, they would fall, too.

This is merely a brief overview of a wealth of behavioral data waiting to be analyzed in detail. If and when that is done the account given here may turn out

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18. Some may have been destroyed by those wishing to escape prosecution.
19. Evidence shows that the extent of the Soviet mass murders, through the period its existence, was far greater even that in Nazi Germany.
20. It is important to note here that all began with tightly held ideas. Some of those who read this may wish to name it 'persuasion by verbal behavior'.
21. The latest name of this organization was KGB.

to be mistaken, and even if not, it will certainly require revision. However that may turn out to be, the resulting information will produce new insights into social organizations in general, and it will extend our knowledge of the operation of contingencies in society in ways that cannot be anticipated now.

SOCIAL CONDITIONS AT THE INDIVIDUAL LEVEL: PERSON-ISLANDS OF THE NEW CENTURY

Lastly, I turn to consider some of the effects upon individual life when an established social system becomes destabilized. One currently destabilizing effect in many societies, especially in the so-called developed countries, is the rapid expansion of technologies compounded with the rise of crime and decline of personal security.

For several decades life-scientists, in particular biologists, zoologists, ecologists, and scientists working in related specialties have been reporting that various ecosystems around the world are becoming unbalanced and destroyed. When that happens, some of the species dependent on those ecosystems become extinct. Thomas Lovejoy (e.g. 1986) has named this process 'ecosystem decay'. In recent decades species have been becoming extinct at an unusually high rate. In other words we are now living, as David Quammen (1996) has described it, in an 'age of extinctions'. The phenomenon has attracted occasional controversy, some scientists and social activists demanding that legal or regulatory action be taken to prevent a looming general extinction, and others claiming that such demands represent excessive alarmism. Mostly, these debates have been limited to a particular species or a particular wilderness area. The issue has almost always become politicized with the unfortunate and dangerous consequence that the acrimonious exchanges have detracted from the attention that should be given to the generality of the phenomena of the age of extinctions. Beyond the scientific community little is generally known about the extent of these extinctions, and even more importantly, about the implications of these phenomena for human life. Quite obviously, they have significant consequences for life on this planet. The principles involved in these phenomena point to profound effects that are occurring, subtly, in human life.

An ecosystem is a marvelous network consisting of the species of living things and their relationships. If that system is portioned off, divided into isolated pieces, it fails to support all of the life that formed the network, and some die. Small, isolated parts of ecosystems are 'islands'. An island is a life-supporting expanse surrounded by hostile terrain. The smaller the island, the less life it can support (see MacArthur and Wilson, 1967, for a detailed account of biological phenomena of 'islands'). Islands have been useful for the study of evolutionary phenomena. Darwin made his main observations, leading him to the theory of evolution, on remote islands, as did other early evolutionary biologists, Wallace, and Hooker.

The islands where they made their observations had established ecosystems with some species only to be found in those systems. In our time, however, new and ever-smaller island-like segments are being created through human activity, carving up huge areas to establish factories, to mine the earth, to extract oil and lumber, and in much smaller scale but often with equal result, to build giant malls, shopping centers, cinemas, etc. We are creating towns and settlements to house the people who will work in those places. Consequently, life supporting islands are getting smaller, and the species of the established ecosystems are becoming extinct.

Almost wholly unnoticed, the biological principles that are now operating in this age of species-extinction, are also operating in human life. In that case what is becoming extinct, or if not yet extinct, facing extinction are the established customs, practices, and values of our daily lives. We are carving into smaller, confined portions the context that supports individual human life. The phenomenon is not confined to physical existence but extends, perhaps even more importantly, to the metaphorical terrain that nurtures human life: in other words, the culture and texture of society which supports and sustains individual life.

The word culture, that is, *cultura*, means the medium, the base that nourishes life, that 'cultivates' and civilizes it. Cicero described cultura as *cultura animi*, meaning culture of the soul. Culture, as we use the term now, is the general state, the habits of action of the individuals participating in it; it is the patterns of the workings of a society, its total body of arts and knowledge; in sum, it is the way of life in a society. It is this that we have been carving into ever smaller pieces. We have slowly but surely been creating what I shall term, person-islands: persons who exist in limited environments, in isolation from the broader cultural bases of life, and consequently, whose quality of life loses its humanness. Just as fragment-islands do not support the existence of some species, person-islands do not support some of the basic characteristics of human nature.

Two main factors contribute to the development of person-islands: first, the rapid development of personal computers and the internet. Increasingly more people are spending more of their time in isolation, surfing the internet and exchanging messages with faceless people.[22] Further, an increasing number of people are working at home because by computer they can access their work from home. Such people are in isolation close to the whole duration of their daily work. The second factor is the character of the environment in which many people, mostly but not exclusively city dwellers, live. That environment is no longer as physically safe as it used to be, so that at sundown many people lock their doors, switch on their burglar alarms and stay in. These effects operate differentially on particular segments of society, the internet-effects mostly on the young, and the

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22. On February 16, 2000, *The New York Times* reported the result of a survey showing that many people are spending more time on the internet and less time with other people.

safety-effects mostly on the aged. The result is that person-islands occur across age groups.

We can, perhaps, alter the course we seem to be set on by understanding our own nature, that is, by scientifically discovering the principles of human action. Knowledge of natural phenomena does not necessarily enable us to act upon those phenomena. It may be that in the workings of human action is embedded the seeds of its own extinction. But that is a terminally pessimistic notion, a recipe for helpless acceptance. The better alternative is to build on the assumption, supported by the lessons of history, that knowledge of ourselves will enable us to survive and progress.

CONCLUSION

There is not now enough knowledge to enable us to save us from the consequences of our actions—not merely 'bad' things that we do, but those things we do which we value but cannot control. As scientific knowledge grows we can use it to prevent or cure disease, to build stronger environments, and to create many diversions to fill our time; but we can and do also use it to make ever more effective bombs, guns, means of spreading diseases, and tools, such as internet access, to steal from and to spy on each other. Scientific advance is hurtling at a breath-taking speed towards an end no one knows. We know from history that curiosity is a basic characteristic of human behavior, and the incessant search for knowledge it cannot be curtailed, even if some wished to do so. The only choice available to humanity is to develop a sound science of human behavior which may then enable us to use science itself well and effectively. There are indications from many seemingly disparate sources that such a science may be a possibility. If we are to save ourselves, we must put together any knowledge that is relevant but scattered under different heads; then we must use that body of knowledge as a base for the new science of human behavior.

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