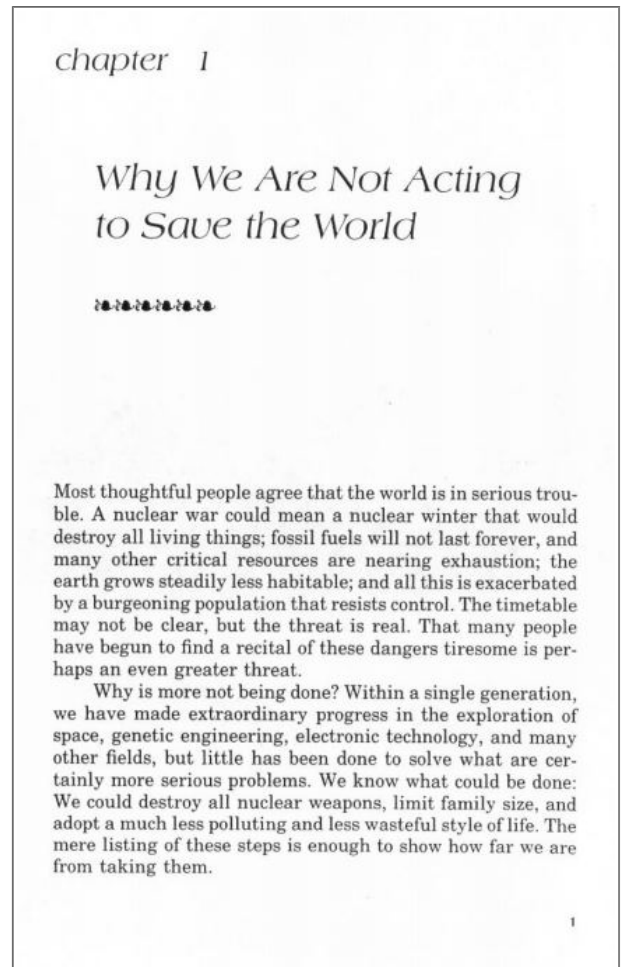


Why We Are Not Acting to Save the World

Von B. F. Skinner, 1987

Aus dem Buch <Upon Further Reflection> 1987
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Most thoughtful people agree that the world is in serious trouble. A nuclear war could mean a nuclear winter that would destroy all living things; fossil fuels will not last forever, and many other critical resources are nearing exhaustion; the earth grows steadily less habitable; and all this is exacerbated by a burgeoning population that resists control. The timetable may not be clear, but the threat is real. That many people have begun to find a recital of these dangers tiresome is perhaps an even greater threat.

Why is more not being done? Within a single generation, we have made extraordinary progress in the exploration of space, genetic engineering, electronic technology, and many other fields, but little has been done to solve what are certainly more serious problems. We know what could be done: We could destroy all nuclear weapons, limit family size, and adopt a much less polluting and less wasteful style of life. The mere listing of these steps is enough to show how far we are from taking them.

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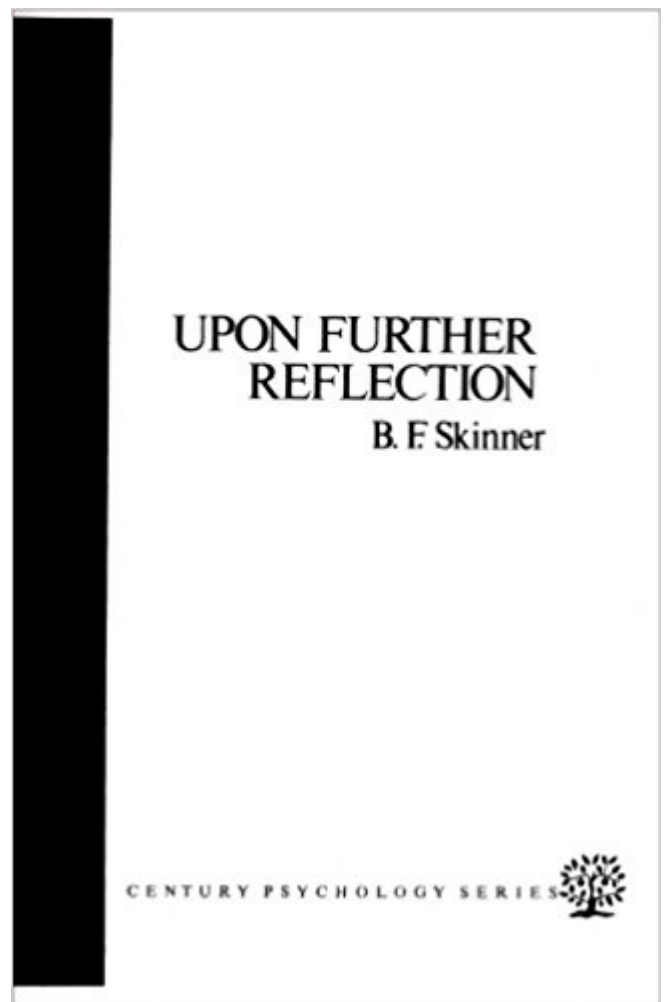
Traditional explanations of why we are doing so little are familiar. It is said that we lack responsibility for those who will follow us, that we do not have a clear perception of the problem, that we are not using our intelligence, that we are suffering from a failure of will, that we lack moral strength, and so on. Unfortunately, explanations of that sort simply replace one question with another. Why are we not more responsible or more intelligent? Why are we suffering from a failure of will? A better strategy is to look at our behavior and at the environmental conditions of which it is a function. There we shall find at least some of the reasons why we do as we do. They are also explanations of the bodily conditions we call feelings and states of mind.

The present problem then becomes clear: We are being asked to do something about the future. But the future does not exist. It

cannot act upon us; we cannot act upon it. We speak of the future when we say that we act with a purpose— but purpose is no longer an acceptable scientific principle. Birds, for example, appear to build nests for the purpose of hatching and rearing their young. They certainly do build them and later use them, but we should not say that they build them because of the future use.

The concept of purpose has been replaced by that of selection, which was first recognized by Darwin and Wallace in the natural selection of species. Birds build nests not because of the nests' future usefulness but because variations in genetic structure that led them to build nests in slightly different ways were selected by the greater chance of survival of the species when that was done. A single instance of nestbuilding has a structure in which an action is followed by a consequence, but the consequence follows only because similar consequences have followed in the past. Our present problem arises because, although natural selection prepares a species for a future, it is only a future that resembles the selecting past. In a different environment, a species may perish.

That fault was to some extent corrected by the evolution of a process through which an individual organism could acquire behavior that was effective in environments too



unstable for natural selection. This process, operant conditioning, is also a kind of selection, and it is not surprising

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that the behavior also appears to be purposive. It is sometimes called goal-directed, but a goal has no effect on the behavior through which it is reached or on the probability that the behavior will occur. Its effect is felt only on future instances. Our problem therefore persists: Operant behavior, like natural selection, prepares the organism for a future, but it is only a future that is similar to the selecting past. Moreover, the repertoire of behaviors that can be acquired without help by a single organism in a single lifetime is not very large.

That fault was in turn corrected by the evolution of processes through which organisms were affected by the selecting pasts of other members of the species. Imitation is an example. When members of a group imitate each other and model behavior to be imitated, they acquire much larger repertoires, which are effective under a greater variety of conditions. The human species went far beyond imitation and modeling with the evolution of verbal behavior, or language. People not only show each other what to do—they tell them.

A language is the product of a third kind of selection by consequences, the evolution of cultures. A culture evolves when new practices, introduced for perhaps irrelevant reasons, are selected by their contributions to the survival of the practicing group. Cultural practices are also said to have purposes. For example, the purpose of education is said to be the production of informed members of a group, but again, we should speak only of selecting consequences. Educational practices evolve when they contribute informed members to the group.

Education is also an example of two other faults that are relevant to our problem: (1) traits persist long after the conditions responsible for their selection have changed, and (2) the changes may have been caused by selected traits. Thus, the digestive system of a species and its ingestive behavior presumably evolved at the same time. In a stable environment, animals "instinctively" eat foods they can digest. That is due to natural selection. When, in addition, special susceptibilities to operant reinforcement by foodstuffs evolved, animals learned to find other foods that also met their nutritional needs. That was particularly important when essential foods were scarce. In the early history of the human species, for

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example, salt and sugar were almost always in short supply. A person in whom genetic change increased the susceptibility to reinforcement by salt and sugar must have learned more quickly and remembered longer where to find them. A trait evolved that

gave the individual, and then the species, an important advantage, but it also caused trouble. Thanks to those very susceptibilities to reinforcement, people discovered and produced great quantities of salt and sugar. The susceptibilities survived, and we now eat much more salt and sugar than is good for us. The species created a world in which some of its genetic susceptibilities to reinforcement were out of date. Fortunately, another cultural practice helps: Medical scientists have discovered the harmful effects of too much salt and sugar and advise people to eat less of them. If the consequences were more serious, candy bars and bags of salted nuts would carry the warning, The Surgeon General has determined that this product may be dangerous to your health.

Two other susceptibilities have caused more of the trouble we are concerned with here. First, when the species was living in a far-from-hospitable world and was periodically decimated by famine and pestilence, it was important for people to breed as often as possible. A heightened susceptibility to reinforcement by sexual contact evolved, which is now responsible for the danger and misery of overpopulation. Second, when people protected themselves and their possessions in hand-to-hand combat, reinforcement by any sign that one had hurt one's opponent helped shape and maintain skillful fighting. A susceptibility to reinforcement evolved that has led to the invention and production of weapons that hurt much larger numbers of people in much more decisive ways.

It is often proposed that we solve these problems by warning people of the consequences of their behavior. "Raising consciousness" is the fashionable expression. It is implied that once people know that their behavior will have dangerous consequences, they will change. Such an appeal to knowledge has caused a great deal of trouble. A distinction is sometimes drawn between knowing what will happen when we act in a given way because certain consequences have

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followed when we have acted that way (in which case we are said to "know by acquaintance") and knowing because we have been told what will happen ("knowing by description"). What is missing in knowledge by description is a reason why we should act. If we borrow our friend's pen and enjoy writing with it, we may buy one like it. We know by acquaintance that it is a good pen. We buy it because positive reinforcement has been at work. If, instead, our friend simply tells us that it is a good pen, we know that fact by description, but we shall buy one only if we have already profitably followed our friend's advice or the advice of others with whom we have had similar experiences.

Obviously we cannot know the future by acquaintance, and we have very little reason to act because we know it by description. In general, the more remote the predicted consequences, the less likely we are to follow advice. We have more often been successful when we have followed advice about the immediate future because that kind

of advice has been more often tested and found better. The advice we are now being offered is about a distant future; it may be good advice, but that has very little to do with whether we shall take it.

We are also not likely to take the kind of advice called a warning. When the predicted consequences of our behavior are punishing, we must prevent or escape from them. But it is often easier to escape in other ways—by ignoring or forgetting the advice or by finding a way to escape that does not require solving the problem. Recent apocalyptic thinking in America has taken the latter line. We are said to be in "the last days." Because our future lies in another world, this world is expendable. Nothing need be done about it.

We are also not likely to take the advice we are now being offered because the immediate consequences are punishing. The old susceptibilities to reinforcement are still with us, and the behavior they strengthen is naturally incompatible with any attempt to suppress it. It takes strong advice to induce most people to stop consuming irreplaceable resources, to moderate the joys of procreation and parenthood, and to destroy weapons that make them feel secure against their enemies. And there is another reason why knowledge

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about the future is not likely to solve our problem: To the extent that advice is not taken, it is not likely to be given.

It is true that advice about a personal future may be effective. Many people have stopped smoking, for example, and perhaps some of them have done so because they were told that it causes lung cancer. That is all the more significant because smoking is strongly reinforced, because the effects of stopping do not follow immediately, and because the advice can be dismissed as merely statistical ("Smoking doesn't cause cancer in everyone, and it won't in me"). But except for a few people who, like physicians, are accustomed to taking that kind of advice and seeing the consequences close at hand, most people have probably stopped for more immediate reasons—a rough throat or a cigarette cough, the annoying constraints of no-smoking signs, the protests of strangers, the condescending tolerance of friends who have stopped, the inflated cost of cigarettes, and so on.

That very fact may be helpful, however. Can something of the sort not be done to solve our problem? Why not arrange immediate consequences that will have the effect that remote consequences would have if they were acting now? There is nothing very new in that suggestion. Ethics is mainly a matter of the conflict between immediate and remote consequences. How can we forego a reward in order to avoid a later punishment or take punishment for the sake of a later reward? Cultures have helped to solve the

problem by supplying immediate consequences that have the same effect as the remote ones. They shame their members who fail to forego immediate rewards or refuse to take immediate punishment, and commend those who do. If eating too much salt and sugar were more serious, it would be called shameful.

It might also be called illegal or sinful, because in advanced cultures sanctions of that sort are taken over by governments and religions. Those institutions outlive people, and those who respond to their sanctions can therefore be said to be working for a future beyond their own. The sanctions are usually punitive: One pays taxes to a government or contributes to a religion because punishment of some sort will follow if one does not. But positive consequences also usually fol-

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low—security and order in the case of government, and peace of mind and answers to puzzling questions in the case of religion. These positive consequences are sometimes called the justifications of governments and religions. Money and goods are other immediate reinforcers used to induce people to work for a future beyond their own—the future of a business or industry. The justification is said to be the more abundant production and distribution of goods. Without these so-called justifications, governments, religions, and capital would not have been able to maintain their control. If the futures of governments, religions, and capitalistic systems were congruent with the future of the species, our problem would be solved. When a certain behavior was found to endanger the species, the institutions would declare it illegal, sinful, or too costly, respectively, and would change the contingencies they impose. Unfortunately, the futures are different. Nuclear weapons are made to guarantee the survival of governments and religions, not the species. Governments and religions estimate their strength in the sheer number of their supporters and are therefore "prolife." (China may seem to be an exception, but overpopulation was already severe; the future had arrived.) Governments and religions enlist support by defending the right to property and the pursuit of happiness, and it is only when a very near future threatens (for example, during a war) that they risk defection by imposing austerity.

Governments, religions, and capitalistic systems, whether public or private, control most of the reinforcers of daily life; they must use them, as they have always done, for their own aggrandizement, and they have nothing to gain by relinquishing power. Those institutions are the embodiments of cultural practices that have come into existence through selection, but the contingencies of selection are in conflict with the future of the human species.

The fact that selection by consequences prepares only for a future like the selecting past is a flaw that, as we have seen, has been successively corrected—the flaw in natural selection by operant conditioning and the flaw in operant conditioning by the evolution of cultural practices. But there is another

possible step. Among evolved cultural practices are those of science, and with them we should be able to intervene in the process of selection. We should be able either to introduce variations (rather than wait for them to occur by chance) or to change the contingencies of selection. Something of the sort has long been done. For thousands of years, people have intervened in the evolution of domestic animals through selective breeding, and they can now do so with greater precision. For the first time it is possible to introduce variations by changing genes. People have always intervened in the development of personal repertoires of behavior either by introducing variations (as by modeling new kinds of behavior to be imitated) or by changing the contingencies of reinforcement. Programmed instruction does both. Only occasionally have people changed the contingencies of selection responsible for cultural practices (although they have sometimes done so to preserve a valued practice that was on the verge of extinction), but people routinely change cultures by introducing new practices as variations to be selected. Rather than wait for further variation and selection to solve our problem, can we not design a way of life that will have a better chance of a future? Perhaps it is time to ask who "we" are. An answer may be found simply by listing those who are now most active in considering the problem. For the most part, we are scholars, scientists, teachers, and writers for the media. We are the uncommitted—to governments, religions, and capital—and are therefore free to consider a more remote future. But we are free only to the extent that we are indeed uncommitted. If among us there are leaders in government, religion, and business, they are with us only to the extent that they are uncommitted to their respective institutions.

Those of us who are scientists can give the best picture of the future, and it need not resemble the selecting past. Much of science is simply a record of what has happened (it is knowledge by acquaintance), but much is also knowledge by description. By analyzing a complex system and applying what has already been learned about its parts, scientists predict events that have never occurred before. By examining a chain of gears, for example, we can say that if gear A is turned

clockwise, gear H will turn counterclockwise, even though we have not yet seen it do so. We can also construct a chain in which a given gear will turn in a given way. The prediction and construction of a rather more important chain of events were confirmed at **Alamagordo**.

We are concerned here, however, with chains involving people rather than gears or nuclei, and much of what we learn will depend upon the competence of those of us who are behavioral scientists. Do we know enough about simple arrangements of variables

to predict the effects of novel arrangements? What facts about experienced cases will tell us what we need to know about the unexperienced?

Much of what is called behavioral science—political science, economics, anthropology, and sociology—is confined to what people have done throughout history or are doing now in the environments in which they live. It is knowledge by acquaintance. With one exception, the same can be said of psychology, which has turned more and more to case histories, questionnaires, inventories, and other records of what people have said and done. The behavior studied by all these sciences is the product of the genetics of the species and of past or present cultures. Moreover, the behavioral scientists are themselves the products of their cultures. As it is often said, they are not free of ideology.

The exception just noted is the experimental analysis of behavior. It is seldom invoked in discussions of the world at large—ironically, for reasons that are in fact its strength, particularly with respect to the present problem. Because it has for the most part studied nonhuman animals, the experimental analysis of behavior is said to neglect all that is essentially human. Because it has been most successful in studying the behavior of nonverbal human subjects—young children or the retarded or psychotic—it is said to neglect cognitive skills. But there are reasons for those strategies. In any field of science, one begins with facts that can be predicted and controlled with some precision and then moves on to more complex facts only when the increasing power of the analysis permits. Where prediction and control are not yet possible, one must turn to interpretation. That is standard scientific practice. Most of the facts of evolution, for example, are out of reach of

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prediction and control. The theory of evolution is an interpretation, but it is strongly supported by a science in which prediction and control are possible—the science of genetics. The experimental analysis of behavior is the "genetics" of the behavioral sciences.

There is another reason why most scientific accounts of human behavior remain a matter of interpretation. The species is distinguished by the fact that its members engage in verbal behavior. They not only respond to contingencies of reinforcement as rats and pigeons do; they talk about them. They formulate rules and give each other, and themselves, advice. They are taught to do so at an early age and continue to do so throughout their lives. In any given setting, therefore, whether in daily life or the laboratory, human behavior must be treated as a joint product of the prevailing contingencies of reinforcement and of what a person says about them. That does not mean that human behavior is not lawful, because we should be able to account for it if we knew all the facts, but most of what people tell themselves about the world in which

they live is a product of a personal history that is out of our reach. For a long time to come, human behavior will probably remain largely a subject for interpretation rather than for prediction and control. Hence we can see the importance of a science that studies the behavior of organisms whose basic behavioral processes are free of verbal complications—that is, non-verbal species or human subjects who have not acquired extensive verbal behavior.

An analogy may be useful. Suppose that the human species developed an organ in addition to the lungs that helped in the exchange of gases with the environment. Then, in order to discover how the lungs worked, we should have to find a person in whom the other organ had not evolved, had been lost, or could be temporarily put out of action. Or we should have to study the lungs of other species. Verbal behavior has the effect of such an organ: The basic behavioral processes can be studied without confusion only when it is out of action. However, verbal behavior itself can be analyzed in the same terms.

Another feature of the experimental analysis of behavior is relevant. Early experiments on animal behavior were

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almost always designed to test theories. The theories were usually drawn from the personal histories of the experimenters. The results were therefore not free of ideology. The experimental analysis of behavior, however, uses very little theory beyond the assumption of lawfulness in its subject matter. It moves on to the study of new properties of behavior as they turn up one after another as the research proceeds. The result is therefore as free as possible of the ideology of the scientist.

If human nature means the genetic endowment of the species, we cannot change it. But we have the science needed to design a world that would take that nature into account and correct many of the miscarriages of evolution. It would be a world in which people treated each other well, not because of sanctions imposed by governments or religions but because of immediate, face-to-face consequences. It would be a world in which people produced the goods they needed, not because of contingencies arranged by a business or industry but simply because they were "goods" and hence directly reinforcing. It would be a beautiful and interesting world because making it so would be reinforced by beautiful and interesting things. It would be a world in which the population was kept at a safe level because all social and economic incentives for having children had been removed and conception was easily preventable or freely revokable. It would be a world in which the social and commercial practices that promote unnecessary consumption and pollution had been abolished. It would be a way of life that would give the species a much longer lease on the planet Earth. It could all be done without "raising consciousness." Only those who designed the relations

between behavior and its consequences would need to take the remoter consequences into account.

What are the chances that a culture so designed could take over? It could not simply be imposed, of course. It would not be the right culture if that were done. Nor could it escape from selection by consequences. New practices would appear as variations, to survive only if they contributed to the strength of the group. The practices mentioned above would obviously run into trouble. They would be opposed by the

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institutions they were designed to replace. Even if the changes were carefully programmed and moved only slowly in the right direction, they would be resisted as soon as it was clear that they threatened governments, religions, and economic enterprises. Nor would it be possible to turn to the people for support, because they would also be the products of earlier cultures. A designed way of life would be liked by those who lived it (or the design would be faulty), but it would almost certainly not appeal to those who like what they like because they have been taught to like it by a different culture.

The power of the uncommitted lies not only in science but in education and counseling. The uncommitted work slowly, however, and our problem seems to demand immediate action. Faced with the indescribable dangers of nuclear war, it seems irresponsible simply to teach young people the ultimate futility of violence. Faced with the unspeakable misery of overpopulation, it seems irresponsible simply to teach young people the satisfactions to be found in a small family or a childless life. Faced with the prediction of what life will be like when critical resources are nearly exhausted and the environment irreversibly polluted, it seems irresponsible simply to teach young people to enjoy themselves in less threatening ways. But building a new culture from the very beginning may be our only hope.

We may find some consolation in the fact that no true intervention is possible. We cannot step into the history of life on Earth as if we were not part of it. If people have ever changed the course of evolution, they have done so because evolved cultural practices made it possible. If we cannot intervene, however, we can at least watch. Are there signs, for example, that institutions are growing weaker? Certainly there is no clear move toward a government that governs best because it governs least. Religion is playing a more important role than it has played for some time, and it has turned again to more violent measures. Business and industry have scarcely narrowed the gap between the rich and the poor of the earth.

Conflicts between institutions are a large part of the trouble, but there is little evidence that they are being resolved. The League of Nations that emerged from the hor-

rors of the First World War grew weaker as the war was forgotten. The United Nations that followed an even more horrible war has grown weaker as memories of the conflict have faded. Ecumenical movements in religion do not go far beyond proselytizing. Competition is still the lifeblood of business and industry, and we are far from a common world market. In short, those who control the contingencies of reinforcement under which we all live show little sign of relinquishing their power for the sake of the species.

Nothing much more promising is to be said for the uncommitted. Many organizations are dedicated to the prevention of nuclear war, overpopulation, and the exhaustion and destruction of a livable environment, but their protests are necessarily directed toward governments, religions, and economic systems, and there they stop. Moreover, the principal modus operandi of these organizations is to frighten people rather than offer them a world to which they will turn because of the reinforcing consequences of doing so.

If the evidence survives, visitors from outer space may some day reconstruct a curious story. The Earth was a small planet, but it proved suitable for life. At some point atoms came together in a molecule that, under just the right conditions, reproduced itself. Random variations in the structure of that molecule made reproduction possible under less favorable circumstances. Cells evolved and then organs, organisms, and species. Interchanges with the environment became more and more complex. In one species, Homo sapiens, the vocal musculature came under operant control and people began to talk to each other and exchange experiences. Elaborate cultural practices evolved, among them science and technology. Unfortunately, they were used to support genetic dispositions that had evolved at an earlier stage. Because food was reinforcing, people raised, stored, and distributed vast quantities of it. Because moving about was useful and exciting, they invented trains, cars, airplanes, and spaceships. Because good things could be taken from other people and then needed to be defended, they invented clubs, guns, and bombs. Because they wished to avoid ill health and the threat of death, they practiced medicine and sanitation. They lived

longer and their numbers increased, and they took over more and more of the Earth and brought it under cultivation. They consumed more and more of its irreplaceable resources. In the struggle for what was left, they began to build weapons so powerful that they could bring life on Earth to an end.

A few people saw the danger and worried about it, but their proposals conflicted with practices that were supported not only by immediate and hence more powerful

consequences but by the out-of-date moral and ethical principles that had been invented to justify them. Those who were able to do so continued to breed at will, consume without restraint, and prepare to defend themselves at any cost. Eventually people no longer worried about the future because there were no people.

A happier ending might run like this: Those who saw the danger began to do more than talk about it. They began to study human behavior with methods that had first evolved in physics and biology. They turned from observing what people had done up to that time to observing what people did under carefully controlled conditions. A science and a technology of behavior emerged that were free of governmental, religious, and economic ideologies. Better cultural practices were designed. Meanwhile, older practices grew weak as their justifications became suspect. Governments no longer provided order and security. Religions failed to give peace of mind and joined with governments in threatening the peace of the world. Their answers to puzzling questions yielded to the answers of science. Economic institutions lost control as automation destroyed both the need for and the enjoyment of productive labor. Education emerged as the dominant force in the maintenance and transmission of cultural practices. The species survived for many thousands of years, and before those visitors from outer space reached Earth, they were met by a similar caravan coming from Earth itself.

Agreed, that is a Utopian ending — but in which of the two senses of that word? Is it to be a better world, or no world at all?

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