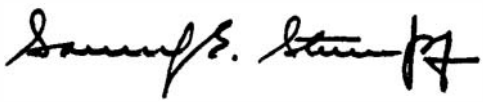

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THE MORAL DIMENSION OF THE WORLD'S FOOD SUPPLY

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THE MAKING OF A MORAL PROBLEM

The moral issues growing out of the world food problem are every bit as urgent as the growing scarcity of food itself. It is, of course, because of this scarcity that most of the moral issues arise. If it is a fact that the population of the world is growing at a far more rapid rate than is the quantity of food, then it is simply a question of time before there are more people than the world can feed, and it is predicted by some experts that the moment when this imbalance will occur is virtually upon us. By now we are familiar with the estimate that we are running out of arable land, pure water, and sources of energy at a time when we are adding each year about 80 million human beings to the world's population.

Whether we face unique moral problems depends to some extent upon the accuracy of information and predictions. Ours is not the first era in history when catastrophe was expected. When Malthus formulated his famous theory in 1798, he was convinced that population would always "press against food," that because of the geometric increase in population with only an arithmetic increase in the food supply, it would turn out that "in two centuries and a quarter, the population would be to the means of subsistence as 512 is to 10, in three centuries as 4096 to 13 and in two thousand years the difference would be incalculable."

Almost 200 years have passed since Malthus presented his gloomy forecast, raising the question of whether or not he had sufficiently taken into account the capacity of human ingenuity to derive from nature a vastly increased basis for subsistence. Even if the ratio of people to food were as permanent in nature as are Newton's laws of physics, would not the possible tragic consequences to mankind be averted by breaking through the slow

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rate of growth in the food supply by means of technological advance? Moreover, was it inevitable that the only check on the growth of population would be the twin forces of "vice and misery," or wars, famine, and disease?

Although the steam engine had been invented in 1776, over 20 years before he published his *Essay on Population,* Malthus did not see in this device the possibility of substituting machine power for human energy, which would thereby radically alter the impact of his theory, which held, among other things, that there is a principle of diminishing returns at work reducing the output of the newest additions to the work force. This view was still held by John Stuart Mill in the nineteenth century when he wrote that "it is vain to say, that all mouths which the increase of mankind calls into existence, bring with them hands. The new mouths require as much food as the old ones, and the hands do not produce as much." But mechanization has changed all that. And there might be additional ways to control population, a point Malthus emphasized in a revised edition of his *Essay.* Although he did not favor mechanical means of birth control, and might not have been pleased to know that later on contraceptives were referred to by some as "Malthusian devices," Malthus did focus upon the need for some deliberate method of population control. The most acceptable way to control population, he argued, was through "moral restraint," which would delay marriage until prospective parents had some assurance they could support their children.

Whether our present worries about the food supply confirm Malthus's worst predictions or whether we stand on the threshold of major discoveries that would alter these gloomy predictions depends upon information not fully available at present. There are reasons for considerable optimism based upon the spectacular achievements of the Green Revolution, the novel modes of planting, fertilization, irrigation, the many forms of mechanization, the genetic alteration of plants and animals, and the rapid advances in biochemistry. Moreover, the use of more sophisticated and effective techniques of birth control can provide a check upon the expanding population. But these advances are not without some complexities. Already we are told that there is an upper limit to what we can expect from the Green Revolution. Not only can we expect a limit to the yield per acre, but the cost of achieving this yield is rising rapidly beyond the ability of some countries to afford it. Objectively, it costs more in energy to produce some foods than there is energy, measured in calories, contained in the food. But unlike Malthus, who could not even envision technological developments, we can aggressively pursue likely alternative solutions, as for example the possibility of harnessing solar energy. We can therefore afford to suspend final judgment of our present predicament on the reasonable assumption that the causes of our present crisis are temporary or transitory. Even the

present uncertainties about the ultimate safety of the contraceptive pill may not be a serious setback, notwithstanding the loss of time in research on new birth control devices caused by the earlier reliance upon the pill as the sure method of controlling the population.

In one sense we do stand where Malthus stood in spite of our immense technology, for, as I have just pointed out, the developments in food technology might not continue at their recent rapid rate, nor might sufficient resources exist in the long run to provide the prerequisites for a universal Green Revolution among the countries of the world. To the extent that the supply of food has increased, the problem has been aggravated, as this increased supply has caused the population to expand and its capacity to reproduce to increase. Even the provision of health services among previously deprived peoples has had the effect of nullifying some of the gains in the food supply by further increasing the size of the surviving population.

Frequently, a promising breakthrough is counterbalanced by some adverse prediction. Some experts feel, for example, that if Bangladesh and other Asian countries were to raise the yield of their rice crops even by "a cupped handful per square meter," hunger in those nations could virtually be eliminated. By contrast, scientists who study the trends in the world's climate point out that recent changes in temperatures are not minor or transitory but indicate a serious long-term cooling. Some of the findings of our climatologists may hardly seem threatening or even relevant to our immediate problems when they speak in terms of the possible repetition of a previous "100,000-year glacial episode" or even "a little ice age" that began in 1300 and was interrupted in the late nineteenth century. But when they point out that during the last 35 years the temperature in Iceland has fallen back to its pre-1900 level and its ports have been iced-in for the first time in this century, leading to a drop of 25% in per-acre hay yields, and when they inform us that the average growing season in the English lowlands is almost 2 weeks shorter than it was in 1940, and when Kenneth Hare, former president of Britain's Royal Meterological Society, warns that "I don't believe the world's present population is sustainable if there are more than three years like 1972 in a row," then the trends in the world's climate take on a level of urgency hardly imagined even a few years ago. Moreover, given the vastly increased population today compared with the small numbers of people on the earth during earlier changes in the climate, any major change now would be calamitous. A prolonged monsoon failure in Asia would affect the most densely populated areas of the world, whereas a prolonged drought could also affect the world's huge granaries in the Soviet Union and North America.

Whatever the predictions concerning the world's food supply, whether optimistic or pessimistic, virtually every moral issue that surrounds this

problem is provoked by some degree of scarcity. There is an intuitive recognition that human beings are bound to one another in such a special way that although some are willing to enjoy affluence while others suffer severe privation, most people would be reluctant to make the pains of others the condition of their own enjoyment. Williams James once wondered "if the hypothesis were offered us of a world . . . in which millions [were] kept permanently happy on the one simple condition that a certain lost soul on the far-off edge of things should lead a life of lonely torture, what except a special and independent sort of emotion can it be which would make us immediately feel, even though an impulse arose within us to clutch at the happiness so offered, how hideous a thing would be its enjoyment when deliberately accepted as the fruit of such a bargain." Today's scarcity poses an even starker problem, which is whether or not some parts of the world can continue to enjoy high levels of consumption while not one but millions of their fellow human beings hover at the edges of malnutrition, starvation, and untimely death.

But moral problems rarely present themselves to us in neat and simple ways—they do not come over the horizon single file but rather in a phalanx. That is why it is not enough simply to calculate how many human beings will need to be fed and then to devise a schedule of production to meet this need. If all we were facing was a simple supply and demand problem, its solution could be achieved with relative speed and ease.

What complicates the food problem is that we are not entirely free to manage or alter the demand side of the equation even though we have a degree of control over the supply. It is one thing to control the material elements that make up a program of food production, but it is quite a different matter to deal with human beings whose growing numbers generate the growing demand for food. Serious moral problems arise when the distinctions between the material aspects of supply and the human aspects of demand are not respected. This occurs when the human aspects of demand are manipulated in the same way as the material aspects of supply in an attempt to bring about a balance between supply and demand. Specifically, this means that when the physical increase in the supply of food reaches a limit, then the demand for this limited supply must be physically decreased by an official policy to decrease the demand, i.e. a policy to reduce the number of human beings.

How should a reduction in the number of human beings be achieved? There are ways, of course, of achieving some control over the expansion of population without denying significant human values. We are not yet at the point where we must adopt a "lifeboat ethic," where some must be thrown overboard lest their presence sink the boat with all its passengers. Nor are we faced with the necessity at this time for *triage,* which acknowledges that

some communities are beyond help and must be abandoned. But a rational calculation on the basis of the best evidence available could dictate stern measures well in advance of a predicted catastrophe. That is why India, for example, with a population of over 600 million, has recently taken steps to prevent an exponential explosion of human beings on that subcontinent. Some measure of the desperation of India is indicated by the policy undertaken by the State of Marharashtra, the second largest state in India. "We have tried every trick in the book," says Dr. Leon D'Souza, who was the second-ranking elected official in the state's ministry of health, "and now we have come to the last chapter." It is not quite the last chapter, but because nothing tried so far had made much of a dent in the state's swelling population, the State of Marharashtra was on the verge of passing a bill that would call for compulsory sterilization of all men with three living children. Those who resist would be arrested and sterilized by force. The official thinking was that although it is painful to admit the need for compulsory sterilization, "survival of the community must take precedence even over morality." Invariably, the manipulation of human nature to reduce demand begins to resemble the manipulation of the material resources to increase supply. Is this morally acceptable?

Ordinarily, morality does not have to enter directly into a supply and demand problem except to insure a free and fair market environment. The exquisite mechanism of a free market adjusts the supply to satisfy the demand. At the same time, in the absence of monopoly, prices are kept down by always increasing supply or by bringing into being adequate substitutes for items in short supply. To a great extent, the world's food supply has responded to the operation of these laws of supply and demand. Because of the increased worldwide demand for food, American agriculture is operating at an increasing capacity; this is true in other countries, also.

But questions arise concerning the adequacy and reliability of the free market mechanism to deal effectively with the need to match food with hunger. During the Irish famine in the 1840s, it was the deliberate policy of the British government to stay on the sidelines and to permit Adam Smith's invisible hand to direct the forces of supply and demand. The government had pledged "not to interfere with the regular mode by which Indian corn and other grains were brought into the country." Instead, they promised "to leave that trade as much liberty as possible." As the crisis worsened, the government made some tentative moves to become involved. But an observer wrote, "the utter inadequacy of the government measures is impossible to describe . . . what use are a few relief committees . . . to deal with the sufferings of hundreds, thousands, nay millions of starving people . . . I defy anyone to exaggerate the misery of the people . . . it is impossible . . . whatever is done by government or Public Works will be too late, after

the people have been driven to desperation by hunger. The whole country is nothing but a slumbering volcano. It will soon burst." But government in the form of central planning does not necessarily solve the problem either, even though the example of the Irish famine suggests that any other course is inexcusably callous. Even the moral argument that through a strict control of supply and demand it would be possible to distribute wealth and resources in accordance with moral standards is inconclusive. The Soviet Union has not achieved the level of agricultural production looked for in spite of its central planning for reasons other than bad luck with the weather. And the rigid system of central planning inherited by the Chinese from the Soviet Union has, in 1980, been replaced by a new emphasis in China upon self-management, competition, and financial rewards for creativity and individual initiative, leading to increased agricultural production. The number of variables in modern economic systems, and especially as they are related to each other in the world, is so great that it is becoming increasingly impossible that any one human mind or even a group of minds could take into account what Hayek calls "the millions of connections between the vast number of interlocking separate activities which modern technology makes inevitable." It can be said that "the market system works because it is able to take account of millions of separate facts and desires, because it reaches with thousands of sensitive feelers into every nook and cranny of the economic world and feeds back the information acquired where it can be immediately used." But the question remains: How we are to deal with those parts of the world that do not participate in the mainstream of the economic order or where unregulated behavior results in a population burden that the limited food supply simply cannot bear. The larger question is whether the problem of the food supply can be separated from political and economic considerations and from freedom in human behavior and in the market place. These are fundamentally moral questions insofar as they bear upon whether or not human values will be preserved and whether or not all peoples will have access to the resources needed for their survival.

THE CONTEMPORARY STATE OF NATURE

Moral discourse is frequently imprecise and diffuse. But Aristotle long ago warned us to be satisfied in moral philosophy with "as much clearness as the subject-matter admits of," adding that "it is a mark of an educated man to look for precision in each class of things so far as the nature of the subject admits of." What we need is a starting point for moral reasoning about issues raised by the world's food crisis. Earlier philosophers derived many of their insights about justice and injustice, right and wrong, and political

authority from a theory of the social contract. They admitted that the social contract was not an historical event. Nor did they believe that the social contract required any particular form of government. At the heart of the social contract theory is an account of how individuals are transformed from a "state of nature" to an organized civil society. The condition of human beings in the state of nature is variously described by the contractarian triumverate of Hobbes, Locke, and Rousseau. What is common to them all is their attempt to derive their moral and political theories from their description of man as they imagine him to be in the state of nature.

What makes the social contract theory relevant today in any discussion of the world's food problem is that the countries of the world appear to be in a state of nature similar to the way individuals were assumed to be in a state of nature before civil societies were formed. There is a striking resemblance between the motives, behavior, and moral concepts of nations today when compared with these same attributes of individuals in the original state of nature. Essentially, the state of nature has been described as a condition in which each individual acted out of self-interest and fear and was, moreover, his own judge of the rightness of his actions as he acquired natural resources and settled his quarrels with other individuals. The consequence of this behavior between uninhibited individuals was the inevitability of chaos, or what has been called the "war of all against all." This also describes the relations between nations since "in all times, kings, and persons of sovereign authority, because of their independency, are in continual jealousies, and in the state and posture of gladiators; having their weapons pointing, and their eyes fixed on one another; that is, their forts, garrisons, and guns, upon the frontiers of their kingdomes; and continual spies upon their neighbors; which is a posture of War." Although some changes have occurred in the relations between nations in recent times, these words written by Hobbes in Paris in 1651 still describe the international state of nature today with considerable accuracy.

THE PSYCHIC STANCE IN THE STATE OF NATURE

The contrast between the state of nature and organized society does not imply that human nature is one thing in the state of nature and something quite different in civil society. On the contrary, men are capable of devising a civil society only because even in the state of nature they already possess the capacity for understanding the requirements of justice and civil order. It is not necessary to assume some sudden mutation of human nature to account for the transition out of the state of nature. The facts of human nature and behavior are relatively constant.

Because the attributes of human nature have such a significant bearing upon the efforts of individuals and nations as they confront the problems of the world's food supply, it is important to consider in some detail some of the wellsprings of human behavior in the state of nature.

The central fact about human behavior is that it differs from the behavior of other elements in nature. By contrast with inanimate objects, which behave in accordance with the laws of nature, it is unique with man, as Kant says, that he acts in accordance with his ideas of the law. One consequence of this fact is that whereas other parts of nature necessarily do what their essential nature requires, man faces virtually an infinite range of options and possibilities. No fixed patterns of behavior exist by which man relates himself to other persons or to things about him. Although man can be considered a social animal, this means nothing more than that he does not like to be alone. It does not necessarily mean that by nature man lives in a political society after the manner of bees and ants, which behave with remarkable orderliness. Almost every form of human association is achieved with considerable difficulty, lacks stability, is always faced with the threat of disruption, be it a religious, political, academic, athletic, or charitable association.

The psychic stance of self-interest in the modern state of nature is particularly significant as men approach the problems of the world's food supply. In the original state of nature, there was no need, nor even a desire, on the part of those who had sufficient resources for survival to enter into a society. The impulse to organize was not so much the product of altruism as it was to devise a more effective way of achieving the ends of self-interest. In today's state of nature the mood is still not a universal desire for a comprehensive society for its own sake. The gradual movement in that direction is impelled at almost every step by a calculus of benefits to be received. And the mood differs depending upon whether people do or do not have easy access to the bounties of nature.

Self-interest as a motivation is not itself either bad or wrong. It chiefly describes man, and nations, in the state of nature. Every organism seeks to survive, and in man and nations the means deemed necessary for survival constitute the content of self-interest. In the state of nature, then, only individuals exist, either individual persons or individual nations acting out of self-interest to assure their survival.

In addition to self-interest, the psychic stance in the state of nature contains the element of fear. We have already described the evidence for this by referring to the "weapons pointing at the enemy and the spies infiltrating their neighbors." Fear does not constitute either a weakness or necessarily an undesirable attitude if by fear is meant merely being alert to the possibility of danger. In the state of nature danger is continual and fear is an extension of self-interest.

The cause of fear is the inability of either an individual or a nation to enjoy permanent security. What undermines security in the state of nature is a special equality of all parties. All distinctions that seem to indicate inequalities, such as strength, wisdom, possessions, and weapons, are nullified by the equal capacity of anyone to inflict the ultimate hurt upon anyone else.

Self-interest, then, is a calculation of the means for survival. Fear is alertness to the dangers that threaten survival. In turn, fear is the motivation for causing injury and death to anyone who threatens one's survival. Everyone, even in the state of nature, understands the morality of self-defense. Indeed, the right to survive, to sustain one's life, is virtually the first element in moral philosophy. But not all injuring is the legitimate offspring of fear or of danger to one's survival. Indeed, self-interest can easily be deformed into selfishness. Behavior is therefore a mixture of acts based either upon self-interest, which all men would approve, since they are required for survival, or upon selfishness, which most men would condemn, even in the state of nature. These motives have a profound bearing upon how individuals and nations approach the acquisition of food and other natural resources.

MORALITY IN THE STATE OF NATURE

It is important to recognize that even in the state of nature men are capable of making moral judgments. To be sure, it can be said that in the war of all against all nothing can be unjust. The notions of right and wrong, justice and injustice have no place there. What is meant by this, however, is that self-defense can be considered the basis for right; nothing one does in the state of nature for self-defense is wrong. As for justice, this is a legal term signifying that an act is just if it accords with the law. But in the state of nature there is no law, no legal order, and for that reason the notion of justice has no relevance, in a legal sense. But justice as a moral concept does have a place even in the state of nature. If anyone pretends that his actions are necessary for his preservation, which he himself does not believe to be the case, he may offend against what all men recognize as natural morality. If, for example, a person takes the harvest, cattle, or even the life of another person presumably out of self-defense, even though he really does not believe his actions are required for self-defense, he is guilty, even in the state of nature, of violating the moral requirements of justice. For this reason, the full description of the psychic stance of man in the state of nature includes the capacity of moral judgment.

To account for the disorder in the state of nature it is not sufficient to focus only upon the psychic elements of self-interest, fear, and selfishness. Conditions external to man likewise have a strong effect upon his behavior.

Communities that have a large supply of food and other means of subsistence are by and large more tranquil than those that do not. The war of all against all is for the most part a scramble among many over a limited quantity of things. The scarcity of things is the cause of fear and strife. The strategy of men and nations to possess resources is greatly intensified as the supply of resources dwindles and the security and survival of the contestants are threatened. In the modern state of nature, the overwhelming specter is scarcity. At the same time, the equal capability of the parties to damage each other increases. The smallest country can control a vital resource or conceivably gain possession of violently destructive weapons and threaten the most advanced society. Moral indignation grows as scarcity takes its toll of human health and lives. Disorder then becomes the product not only of jealousy and greed, but of an intuitive sense of unfairness, of injustice, in the face of disparity.

In the state of nature, everyone is his own judge concerning what is required for his safety and for his survival. Moreover, everyone has a right to everything he judges necessary for his survival. In this way, the state of nature exhibits a condition of individual liberty. It is not necessary that liberty in the state of nature should lead to a war of all against all. Conceivably, by using their intuitive judgment individuals could control their behavior so that the freedom of everyone would be preserved. But the proper use of liberty to secure one's survival tends to be transformed into an aggressive usurpation of more than is needed for survival or security. The injured party by an intuitive right resists and retaliates. What complicates the dispute is the possibility of self-deception concerning what is required for security. Moreover, subtle elements in the psychic stance, such as the passion for honor and preferment, engender jealousy and greed. Under these circumstances it cannot be expected that the parties can approach their contest in an unbiased way. To be both a party and judge in one's own cause could hardly be expected to produce a fair decision. In the absence of an independent tribunal, virtually the only recourse is physical force and the result is anarchy and war.

All the ingredients for a moral system are available to men in the state of nature in spite of various complicating elements in the psychic stance of natural man. The key is that even in the state of nature men can distinguish between a bona fide act of self-defense and a pretended one. In this regard parties in the modern state of nature (nations) are no different from parties in the original position (individuals). Their awareness of their own interests does not affect their knowledge of moral principles, only their willingness to accept these principles. The true test of a moral principle is not how effectively it solves one party's problem, but whether or not it provides a universal basis for behavior. Rather than detachment from one's

special interests, the prerequisite for moral insight is sensitive intuition and rationality. All men intuitively know that to injure, to steal, or to kill is morally wrong. Causing injury, taking of possessions, and killing can be rationally defended under special circumstances. Nevertheless, both moral intuition and rationality are natural attributes of human nature even though the degee to which they function can be enormously influenced by experience, education, and environment. To justify various modes of behavior on the grounds of the natural right of self-defense implies that the preservation of one's life is a universal and not a special right. To condemn actions that pretend to be directed at self-defense but are not is to acknowledge the primacy of honesty in morality. Honesty is itself a requirement of rationality as well as of morality. All this is known in the state of nature. Bias occurs not as much in misunderstanding moral principles as in interpreting and applying them in concrete circumstances. The judge does not necessarily have more knowledge about justice; his function is to insure that all relevant information is brought out in the process of evaluating the controversy. Even the awareness, in the state of nature, that bias is possible, that to be both party and judge in one's own case is prejudicial to fairness, underscores the natural capacity of men to discern moral principles.

The moral principles that emerge even in the state of nature are that each party has the right of survival, the right to have access to the resources required for survival, and the right to do what is necessary to survive. But bare survival is only a first principle. The right to survive says something about the value and dignity of human beings. The right of access to the resources required for survival involves some further principles of distribution. The right to do what is necessary to survive implies a wide range of freedom. Furthermore, human dignity implies levels of physical, mental, and aesthetic functioning. Human freedom implies constraints so that one's freedom will be compatible with another's freedom. And the distribution of resources requires some principle by which equalities and inequalities will be taken into account.

Each of these moral principles is related to the problems of the world food supply. To survive requires adequate food. To survive and function physically and mentally at an acceptable level requires both an adequate quantity of food and a nutritionally appropriate diet. To have access to adequate food implies access to various resources and services that are indispensible for the production of food but that are unevenly distributed throughout the world. The universal liberty in the state of nature by which each party pursues every means of access to resources for survival inevitably causes conflict. In such an environment, everyone's right to everything turns out in effect to be no one's right to anything. In the modern state of nature, the ability of the parties to claim their natural right to everything they consider

necessary for survival is limited by growing moral and quasi-legal constraints. Military power is a further constraint. Thus, for example, even when a strong argument from the right of survival could be advanced to justify seizing Middle East oil wells by some Western nation, the possibility of counterattack from another military power effectively nullifies such a move. The realities of the modern state of nature amount, therefore, to a virtual standoff between all parties based upon an earlier distribution of resources achieved either by natural geographical location or by acquisition at a time when neither moral nor military constraints were sufficiently effective.

THE INVENTORY OF RESOURCES

How much food is actually available for the human family? What, in short, is the status of this critical inventory?

The inventory of resources in the original state of nature was assumed to be sufficient to provide for human survival. Locke was concerned only that men should not waste anything. Beyond that, he said that "as much as anyone can make use of to any advantage of life before it spoils, so much he may by his labor fix a property in; whatever is beyond this is more than his share and belongs to others." Similarly, Hobbes spoke of the inventory of resources in reassuring terms. For him, "the Nutrition of the Commonwealth consisteth in Plenty, and Distribution of Materials, conducing to life," is conveyed by "convenient conduits" for the public use. Whatever men needed for survival they could get "from the two breasts of our Common Mother, Land and Sea." The "Matter of this Nutriment," he said, consisted "in Animals, Vegetables, and Minerals . . . layd . . . before us, in or near to the surface of the earth" and to acquire them "there needeth no more but the labor and industry of receiving them" since "Plenty dependeth merely on the labor and industry of men."

In today's state of nature, the question is whether "plenty" still depends merely upon the labor and industry of men. Or have we used up so much of the earth's resources that no amount of labor and industry can prevent shortages from leading to a reduced standard of living for some and questionable survival for others? It makes a difference how moral problems will arise and what novel moral obligations we will face if an irreversible reduction or depletion of our resources has occurred. To say, for example, that we may have to adopt a lifeboat ethic assumes that the depletion of resources is so severe that only by sacrificing some people will others be able to survive. Although moral principles do not normally depend for their validity upon particular circumstances, still, the justification of extreme decisions or policies must rest upon a reliable estimate of the inventory of resources.

Because the condition of plenty or, at worst, only relative scarcity was assumed in the original state of nature, the relation between the population and the inventory of resources was not a matter of collective but only individual concern. The cause of friction between individuals was not so much an overall scarcity of natural resources as it was a shortage in a particular place. Such a shortage could be overcome either by more vigorous labor or by moving on to a more promising location. Or a final approach would be to invade another person's area and take the fruit of his work.

By contrast, the conditions in the modern state of nature render the relation between the population and resources of the world both an individual and a collective concern. Some of the solutions suggested today are similar to the original attempts. Nations can undertake more vigorous agricultural and industrial programs. They cannot, however, move on to more promising locations, as most of the earth's territory is already occupied. The possibility of planetary exploration and migration is not ruled out but is hardly a likely option in the near future. As for invading another nation's territory, reasons would have to be given to show that the resources in the territory invaded were needed for survival and even then the invader would encounter military resistance.

As the international setting is for practical purposes in a state of nature, each nation can define for itself what is required for survival. Although a growing body of international law exists, no compulsory jurisdiction gives the World Court powers of enforcement, so that in this respect "Covenents, without the Sword, are but Words and of no strength to secure a man [or nation] at all." Still, says Hobbes, "the most frequent reason why men desire to hurt each other is that many men at the same time have an appetite to the same thing; which yet very often they can neither enjoy in common, nor yet divide it; whence it follows that the strongest must have it, and who is the strongest must be decided by the sword."

Whether a nation chooses to work hard, explore unused land, or in desperation invade someone else's territory would depend upon the factual circumstances of the world's inventory of resources. The other major alternative, namely sharing resources by those who have plenty with those in great need, also would depend upon the forecast of available resources. Even in the state of nature, nations, as individuals, are capable of distinguishing between crass selfishness, enlightened self-interest, and a bona fide act of self-survival.

No nation can act today without a moral evaluation of its behavior by other members of the community of nations, even though sanctions in the present state of nature are difficult to achieve. Although an intuitive moral sensitivity exists in the state of nature, the brute facts concerning supply are capable of overwhelming the ideal moral decision. No nation consciously agrees to a policy of suicide. If, for example, the extreme circumstance

occurs where a redistribution of resources among all people would result in an insufficient amount for everyone, such a division would be resisted notwithstanding the moral urge to achieve a condition of distributive justice. However, a forecast of scarcity could have a creative effect if, as so often has occurred in the past, it inspires exploration for alternative sources or adequate substitutes for dwindling resources. Moral attitudes, which fluctuate from generosity to selfishness as resources diminish, could be influenced by the quality of the forecasts. Inaccurate estimates of resources could cause morally questionable behavior; if the estimates optimistically overstate the world's inventory, the result could be an unnecessarily high rate of consumption; if the estimates pessimistically understate the future possibilities, an unseemly scramble for the most favored position in relation to resources could ensue.

Estimating the quantity, variety, and probable duration of the world's inventory of resources is an extremely difficult calculus. The most reliable estimates of the world's resources in the past have almost invariably been wrong. They were wrong not only because of an inaccurate calculation, but because major resources were at that time not even known. For example, 100 years ago, oil, natural gas, and uranium would not have been included as major items in an inventory of world energy resources. At that time, the inventory would have included such traditional forms of energy as coal, wood, peat, and animal power. Less than 50 years ago, any calculation of the world's food supply would have been hopelessly erroneous, as it would not have taken into account the dramatic increase in harvests produced by the Green Revolution. Also, using Malthus's assumption that as wealth and the food supply increase the population would double about every 25 years, the population today in the United States would be 574 million instead of somewhat over 200 million.

Thus, the forecasts of the three crucial elements that affect the well-being of the world, namely the size of the population, the quantity of the world's food supply, and the availability of adequate energy, have all been seriously misleading. What made some of these forecasts misleading, in addition to the lack of knowledge about alternative resources, was the assumption that social, moral, and political values would remain constant. However plausable Malthus's theory was in assuming that an increase in wealth would result in an increase in the food supply, which in turn would increase the size of the population, this sequence has not occurred in most developed societies. Indeed, in Britain, Malthus's own country, the rate of population growth has been dramatically lower than would be expected from Malthusian assumptions, not because of increased poverty but precisely because of an increase in wealth. Increased wealth affects social values most frequently by leading to a voluntary reduction in the birth rate.

How are moral values affected by the changes in the inventory of resources? In the present state of nature we need to deal with the best information and forecasts we have about our resources. Likewise our moral reasoning should be limited to the strongest intuitive judgments available to rational persons. Accordingly, a moral analysis of the inventory of resources can be limited to three closely related moral principles: (*a*) the right to survive, (*b*) the right of access to the resources needed for survival, and (*c*) the right to do whatever is required to survive.

THE RIGHT TO SURVIVE

To speak of "rights" implies that the three previously mentioned principles of behavior are appropriate and, even more, are required and therefore justified merely by what it means to be a human being. No other reason is necessary to justify survival than the fact that every other moral right or duty assumes that man's irreducible aim is to survive. Another way to use the word "right" is a purely legal way, meaning that "rights" refer to modes of behavior defined, protected, and enforced by the legal system. But in a state of nature there are no legal rights because there is no legal system. Yet even in a state of nature fundamental moral rights belong to man as man. Although there are legal systems in the countries of the world, there is no fully developed separate world legal system. For this reason, many of the problems in the modern state of nature that concern the inventory of resources are moral problems and they cluster around the elementary urge for human survival.

The very use of the word "survival" suggests a present or impending crisis. In some parts of the world the scarcity of food has in fact already produced famine, starvation, and death. For the near future, Stanford biologist Paul R. Ehrlich says that "the race between population growth and food production has already been lost. Before 1985 the world will undergo vast famines—hundreds of millions of people are going to starve to death . . .unless plague, thermonuclear war, or some other agent kills them first." Even Dr. Borlaug, who has done so much to increase the food supply through his remarkable achievements, which brought on the Green Revolution, foresees famine-torn nations "disintegrating into chaos," and he predicts that Bangladesh, India, Egypt, and Indonesia could possibly succumb "by the end of this decade."

A glance at a chart plotting the curve of the growth of the world population appears to support contemporary fears that a population explosion of unprecedented proportions is imminent. To get some perspective, we discover that if we begin with the year 8000 B.C. and draw a line along the chart to about 1700 A.D., the line is virtually flat, indicating that the rate of growth

in the population remained almost unchanged for about 10,000 years. In 1650, when the world population was 0.5 billion, it was growing at the rate of 0.3 of 1% per year. At that rate it would take 250 years for the population to double. But by the year 2000 A.D. the total population could reach 7.0 billion and the question is whether or not the production of food can increase rapidly enough to support such a large population.

Although forecasts have been wrong before, as we have already pointed out, there is considerable agreement that our present predictions have value as warnings even though they may lack some accuracy. As warnings, they could lead to decisions and policies that might avert the worst consequences of a continuation of present trends. If the present trends do represent a threat to survival, then some novel moral problems will have to be faced.

How shall we understand the right to survive if the population expands beyond the limits of resources? Does anyone have the right to survive at the expense of another? Human survival in the normal course of life is not the same as survival in other forms of competition. We regularly accept the fact that in athletic contests one party wins and the other loses. In a competitive economy it is assumed that the more efficient competitor can and even should drive the less efficient out of existence. We do not extend the rules of these forms of Darwinism to the competition for survival between human beings, where Darwin originally meant his theory of the survival of the fittest to apply. The weak, young, old, poor, and ill all count as human beings and can claim the same right to survival as any other human being. The major question therefore is what should be done if the total number of human beings is greater than the means of subsistence? At this point it is no answer to say that more effort should be extended to increase the food supply. For the present, we are assuming that everything has been done that our present ability to increase resources can achieve.

The right to survive is a meaningless right if there are not sufficient resources to support survival. One can ask whether or not it is moral to continue to increase the population in the face of evidence that survival for some will be impossible. This is purely a question of numbers. But the rigorous question is whether or not it makes any sense to talk about such values as, for example, human dignity, freedom, and justice if the known outcome of the population expansion is inevitable pain, malnutrition, starvation, and death. Our moral instinct is to affirm the right of survival even under these circumstances, probably because we do not believe that these circumstances will come to pass. It is as though morality can be served by anguishing over these problems while continuing to do those things that will worsen the situation. Because the dire consequences are not immediate, they do not seem dire. There seems to be a subtle assumption that to affirm the moral right to survive will in some way produce the resources for survival.

But to affirm the right to survive has significance even though the future might be full of foreboding. Such an affirmation could insure that a decision to deny survival for some will not be made prematurely. It means, moreover, that the present state of the inventory is not accepted as the last word concerning the resources available for survival. Before the crowded lifeboat is lightened, a reasonable time might be spent waiting in the hope that a rescue ship will come over the horizon. The inventory would be increased not simply by a passive expectation; it would require an aggressive increase in the production of food, including ways hardly conceivable today.

There is a moral risk in expecting normal forces to bring food and population into equilibrium. If there are promising procedures for developing higher-yield genetic strains of various grains, multiplying the production of animals by novel biological breeding, creating single-cell foods of high nutritional value, and growing crops in polyethylene film without the need of soil, the question is whether or not there is enough time to increase the food supply even in these ways. On the other side, is there enough time to reduce population trends by such normal means as an appeal to "conscience" or better judgment? Are human beings capable of assuming the responsibility for solving the population problems on a voluntary basis? It takes considerable moral resolve for individuals to sacrifice their own interests, a larger family or a high standard of living, in favor of the interests of others in near or especially in remote communities. It is even more difficult to sacrifice present desires in favor of values accruing to future generations. The instinct to survive is so strong that it focuses man's attention upon the present and transforms his luxuries into necessities, thereby causing him to consume the inventory of resources at a maximum rate. For some, the only convincing evidence that the inventory of resources is insufficient to support a given population is an actual irreversible shortage. By then, however, the means of survival would no longer be available for everyone. If this condition were to occur with relative suddenness, it would mean an intensification of the state of nature. Having assumed that the inventory, though not limitless, was sufficient for an indefinite future, nations would have followed their individual goals, paying little attention to the serious complications and dislocations being caused by the indiscriminate consumption of resources. The differences between the highly developed and the less-developed countries would become more pronounced. A sudden development of critical shortages would leave insufficient time to arrange the relations between countries to insure an orderly distribution of remaining resources. The primary right to survival would then open the way for the second moral right in the state of nature, namely the right of access to resources required for survival.

THE RIGHT OF ACCESS TO RESOURCES

The moral right to have access to resources is implied by the primary right to survival. What makes this a moral problem is the uneven distribution of resources. Those parts of the world that have the largest populations also tend to have the greatest scarcity of resources. The uneven distribution of resources is caused partly by nature. Some parts of the world are simply not endowed with abundant or even sufficient natural resources. But another reason for limited resources is the inability or the failure of a particular population to develop what is potentially available. In any case, the inequality of resources between countries affects people's access to these resources, thus raising moral questions about distributive justice.

In the original state of nature, men had access to resources by simply acquiring them. Acquisition was achieved through labor. Anyone, said Locke, could have as much as he could use "to any advantage of life." Until someone mixed his labor with the land or food, it was held in common. Only after investing their labor in things could men "fix a property" in them. There was no agency, no person, no government "distributing" resources unless, as Locke says, "God gave the world to men in common."

Although access to resources was simple, the process of acquisition was surrounded by moral rules. For one thing, all resources must be used to an "advantage of life." For this reason, there must be no waste. Even if someone mixed his labor with things, he could acquire only as much as he could consume "before it spoils," since "nothing was made . . . for man to spoil or destroy." Whatever is beyond what one could use before it spoils "is more than his share, and belongs to others." Although by his labor a man could remove something from common use, there was a specific limit to the amount of property he could acquire, namely that there must be "enough and as good left in common for others."

In the modern state of nature, by contrast, virtually all resources have already been acquired. Everything is somebody's, except, for example, the resources on the ocean floors. Access to resources is now difficult. The long historic process of acquisition has brought us to our present-day "distribution." The unevenness of this distribution has resulted in dramatic differences in the standard of living throughout the world. Moral questions are being asked about the justification of the present distribution of resources. These moral questions are aimed primarily at the means by which the resources of the world have been acquired and how the inequalities can be justified. The language used today concerning man's natural moral right to access to the resources required for survival resembles Locke's moral discourse. There is concern about waste, spoilage, "more than his share," "belongs to others," and must be "enough and as good left for others." All these moral concerns are raised in the name of distributive justice.

There is no precise formula for distributive justice. It certainly does not mean an equal division of resources. All manner of inequalities can be justified even by those who consider equality the most important aspect of social organization. Government leaders should not have to stand in line for a bus like everyone else since their time and responsibilities are more important, so they have access to limousines. Scientists and artists need ample surroundings to pursue their creative tasks. But there is a meaning to distributive justice nonetheless. Generally, distributive justice means that the division of resources should not be arbitrary, or at least that if the division is unequal it should not be at the excessive expense of those at the lower end of the scale. Every unequal division should, in short, leave everyone better off.

The emphasis in the original state of nature was not so much upon the division as upon the use of resources. Indeed, Locke was critical of those who appeared to be preoccupied with the division of things instead of concentrating upon ways to make sure there would be something to divide. Resources were given, he said, "to the use of the industrious and rational —and labor was to be their title to it—not to the fancy or covetousness of the quarrelsome and contentious."

But how much could the industrious and rational use without amassing so much that it would spoil? Moreover, would the development and accumulation of resources by the industrious and rational be available as "an advantage" to the life of man? What concerned Locke was whether in the process of acquiring resources someone would injure another human being. If he used all he acquired, there was no injury, provided "enough and as good (was) left in common for others." If he gave away part to someone else so that it did not spoil and perish in his possession, this also counted as an acceptable moral use. The moral use of things could be extended by other means. For example, plums, which might rot in a week, could be bartered for nuts, which could last a year. No one would be injured by this transaction and there would be no waste as nothing perished uselessly. If someone traded the nuts for a jewel or his sheep for a bright piece of metal he could keep all his life, "he invaded not the right of others; he might heap as much of these durable things as he pleased." It was not the largeness of his possessions that was morally wrong, said Locke, but "the perishing uselessly of it." The final strategy by which the industrious and rational could extend their accumulated property without injuring or invading anyone was through the use of gold and silver: ". . . and thus came in the use of money—some lasting thing that men might keep without spoiling." By mutual consent men began to take money in exchange for the truly useful but perishable supports of life.

If the use of money made possible the accumulation of resources, an even greater vehicle of this accumulation was the possession of land. Who should

have the land? Only someone who would productively use it. Otherwise it would be wasted and would lose its usefulness to the life of man. Therefore, whoever appropriates land to himself either by his labor, in exchange for other things, or for money has a moral right to it. Moreover, by fully using the land, he increases mankind's inventory of resources that provide for the support of human life. One acre of land appropriated and worked by someone makes available many more times the resources than 10 acres of equal quality lying waste. The actions of the industrious and the rational are moral as there is no invasion or injury at each transaction. The industrious and the rational also positively increase the standard of living of everyone by efficiently developing the natural resources.

If this is an accurate analysis of how the present distribution of resources came about, except for notorious cases of plunder, it would mean that the inequalities are accounted for in part by the activities of the industrious and the rational. Even Marx acknowledged in the *Communist Manifesto* the extraordinary achievement of this social class, the industrious and rational, when he wrote:

> The bourgeoisie, during its rule of scarce one hundred years, has created more massive and more colossal productive forces than have all the preceeding generations together. Subjection of Nature's forces to man, machinery, application of chemistry to industry and agriculture, steam navigation, railways, electric telegraphs, clearing of whole continents for cultivation, canalisation of rivers, whole populations conjured out of the ground —what earlier century had even a presentiment that such productive forces slumbered in the lap of social labor?

Although the developments since the original state of nature have resulted in inequalities, man's access to the resources required for survival has been greatly facilitated. That there is so much resentment over inequalities is to some extent an ironic measure of the success achieved in the struggle for equality. Constant improvements have engendered increased expectations throughout the world. There can be no denying that severe injustices have occurred along the way. Still, as Daniel Bell has said, "a striking fact of Western society over the past two hundred years has been the steady decrease in the disparity among persons—not by distribution policies and judgments of fairness but by technology which has cheapened the cost of products and made more things available to more people." In any case, access to an adequate food supply might well depend upon further technological advance and political measures that will bring more land under cultivation, increase the nutritional value of foods, solve marketing and distribution problems, and provide production incentives and economic support to developing areas. If these measures are not successful, there could be a novel expression of the third natural right, which is the right to do whatever is necessary to survive.

THE RIGHT TO DO WHATEVER IS NECESSARY

Because the food supply is an elementary necessity for survival, men have always claimed the right to do whatever is necessary to acquire and assure that supply. Although the circumstances surrounding the acquisition of food may have changed since the original state of nature, the moral principles governing this activity are the same today. The major moral principle here is that the quest for survival justifies a wide range of freedom of action. Whatever action can be connected with the requirements of survival are morally justified. The freedom of one party is limited primarily by the rights of other parties to an equal freedom. There is the rare exception when one party can survive only if the other does not. Beyond that exception, morality requires that the freedom of all members of the community should be compatible. Within that limit, the acquisition and production of the food supply can be pursued by exercising the right to do whatever is necessary for survival.

The right to do whatever is necessary to insure survival is a moral issue that arises in its sharpest form when the inventory of resources is not sufficient to support the entire population. The lifeboat must be clearly overloaded. There are instances where self-defense seems justified. In these cases, the right to do "whatever" has no limits. If one has a right to survive, then he also has a right to do whatever will overcome a threat to his survival. The only additional moral principle relevant under these extreme circumstances is that the danger must be real. The act of self-defense must be bona fide and not pretended. To sacrifice one's own life is a moral possibility, but no one can expect another to make such a sacrifice on his behalf as a matter of right or duty.

It is not necessary for the final event to occur to prove the existence of danger. Although the lifeboat is still afloat, it can nevertheless be overloaded. The inventory of resources can pose a genuine threat to survival even though no one has yet starved. Whether one has a moral right to do whatever is necessary to survive is determined by the time remaining before the final event. Calculating the amount of time left requires both adequate information and honesty. If the food supply is sufficient for 50 years, only certain policies can be morally acceptable in the name of survival. If the best estimate is that the population cannot be supported for more than 5 years, quite different decisions could be morally justified.

The moral right to do whatever is necessary for survival is a right that, in the state of nature, everyone, individuals or nations, possesses simultaneously. This is a raw condition where the only distinction between the parties is their relative strength, wealth, location, and skills. In the original state of nature where the contests for survival involved mainly individuals,

these same distinctions were effectively neutralized by the possibility that no one could be secure against attack and death. In the present state of nature, there is still considerable insecurity. The strongest nations are vulnerable to incalculable disruption by small nations or by a few terrorists. Nevertheless, the strong nations do possess enormous economic and military advantages in relation to smaller and especially less-developed nations. Under these circumstances, the right of everyone to do whatever is necessary for survival is a right that in practice only the strong can express effectively.

We normally assume that the moral right to do whatever is necessary for survival is a right to destroy anyone who threatens our own existence or a right to take what is needed for our survival. But these are not the only alternatives. If survival is the fundamental goal of everyone, then the moral right to do whatever is required for survival must be viewed from the point of view of the entire world community and not only unilaterally. Although the requirements for survival could legitimately include the destruction of adversaries and the acquisition of their resources, these extreme measures must be reserved for the last days—for the unambiguous moment of genuine danger to one's survival. We have already accounted for the possibility that extreme measures might be pursued by some without moral justification, either deliberately for selfish reasons or accidentally because of a miscalculation of the actual condition of the inventory of resources. In either case, the result would be that every party simultaneously expressing the right to do whatever appeared necessary for survival would create anarchy, a war of all against all. That may be the tragic consequence of the realistic circumstances in the future. However, without abandoning self-interest and while committed to the moral right to survive, nations, not unlike individuals, might conclude that their survival is best assured if they facilitate the survival of the potential adversary. This would still leave the moral question of what to do in the presence of a genuine crisis, where under no conceivable circumstances could all parties survive in the face of a severely depleted inventory of resources. Everything depends upon the status of the inventory in relation to the population, both at the present time and as projected into the future. The moral right to commit an act of self-defense must be postponed as long as possible. Meanwhile, the self-interest of the parties can be served by the moral requirement that every party should do what will facilitate everyone's survival. One defends himself not only by destroying someone else, but also by assisting the other to survive, thus eliminating his need and justification for an aggressive act. The moral right to do whatever is necessary to survive turns out to be a moral duty to seek peace and the welfare of one's neighbor. One way to achieve these ends is to increase the world's food supply.

Increasing the world's food supply is the key to the present-day quest for survival among the various members of the world community. An abundant food supply would considerably reduce the tensions between different parts of the world. Better-nourished children would become more productive adults. Resources used earlier in dealing with diseases and poverty would become available for education and economic expansion. Improved health, education, and economic security would provide those improvements that lift human beings above mere survival to a more acceptable quality of life. That all these obvious objectives have not yet been achieved is due in large measure to disagreements concerning the right to do whatever is necessary for survival.

Survival does not mean the same thing to everybody. For some it is no more than elemental biological survival. For others, it is a total way of life. The right to do whatever is necessary for survival means one thing for a poor Asian and something quite different to an affluent Westerner. Moreover, both can, by exercising their right, do things which might help them survive but at the same time would worsen the prospects of their future survival. The poor might conclude that a larger family provides a necessary form of security. The result is an increase in the population. The rich require a high rate of consumption and thereby decrease the world's non-renewable resources. An increased rate of consumption accompanied by an increased growth in the population can only produce a future disaster. Thus, it is possible that in the name of survival, individuals and societies might affirm certain rights in such a manner as to complicate rather than ameliorate the plight of the human race.

The production of food provides a vivid example of the step-by-step movement from the simple concept of survival to the point where an act of survival involves all the elements of a society or culture in a collective act. In the earlier state of nature, an individual could survive simply by gathering what nature provided. Even today, in simple communities, individuals survive by their own efforts as they derive all their sustenance from a small piece of land. At the farthest extreme is the organized food industry producing enormous quantities of food not only for the local community but for virtually every part of the world. What began as an effort to supply the needs of the immediate population has grown into an enterprise capable of creating huge reserves for the future and commodities available for purchase by anyone who can afford them. As the production of food has increased so has the population, and this in turn has used up the reserves and has required an even higher rate of production of food. This gradual step-up in population and the level of food production to support it has resulted in a precarious balance that requires that the production of food continue at increasingly higher levels. To the extent that food produced by

the large industrial organizations guarantees the survival of people at home and in faraway places, these organizations can rightly invoke, as individuals did earlier, their right to do whatever is necessary for survival—their survival as the source of food products and the survival of those who rely on their products. Increasingly, therefore, the survival of individuals requires the survival of an intricate organization of the food industry, which is today the most reliable source of the world's food supply.

Whenever the right to do whatever is necessary to survive is affirmed, there is the assumption that the benefit of survival justifies virtually any cost. If human life is the pearl beyond price, there can be by definition nothing more valuable. To produce an adequate world food supply involves many costs and the question is whether or not those costs are justified. This would not be a serious question if there were alternative ways to produce an adequate food supply that did not exact these costs. Some of these costs include bringing more land into cultivation, thereby reducing the aesthetic enjoyment of the countryside; using more machinery to increase efficiency, to produce more for less, thereby displacing local labor who then migrate to overcrowded urban centers, frequently swelling the ranks of the unemployed; using up more energy resources to produce and operate agricultural machinery, disfiguring the landscape through mining and drilling operations, and polluting the air and water; using pesticides, fertilizers, and chemical additives with varying degrees of risks and hazards to health and life; and deliberately limiting the size of families at the cost of the freedom to have as many children as one wishes.

These and other aspects of food production cover a wide range of costs. Some of these costs can be considered primarily aesthetic. Others are economic. Still others represent moral costs as they involve risks or outright threats to, or even the denial of, human life. These different kinds of costs appear at different levels on a scale of values. Aesthetic values are found on a lower level than human safety whereas economic values stand midway between aesthetic values and human safety. Moral values are inevitably involved inasmuch as the choice between aesthetic, economic, and safety values involves individual human welfare. Should human beings suffer the privation of an inadequate food supply to preserve the natural beauty of the countryside? Is it desirable to achieve efficiency through large-scale agricultural technology at the social cost of increased urbanization with its crowded communities, unemployment, widespread poverty, and crime? Is the risk to human safety through the use of pesticides, fertilizers, and chemical additives adequately balanced by an increased food supply? Is there a moral justification for limiting the size of families?

Some of these questions readily answer themselves. If it is a clear choice between aesthetic values and survival, aesthetic values are sacrificed in favor

of life. An individual willingly accepts a disfigured body if the removal of a malignancy requires it. Although economic costs rise as lower-grade land is brought into cultivation thereby requiring more technology to achieve adequate levels of production, these costs are acceptable even though it means that less purchasing power remains for other desirable things. Even increased urbanization is accepted with all the costs of deterioration in the quality of life if the alternative is an inadequate food supply. The use of pesticides, fertilizers, and chemical additives appears to require a cost in the form of probable hazards to life, yet these products provide the most support for survival. And if it becomes incontrovertible that the earth cannot bear the burden of a further increase in its population, the morality of a rational determination of the birth rate would become clarified. Although the survival of the human race poses hard choices for the application of the right to do whatever is necessary, there is reason to believe that human beings will intuitively use this right in the best way to assure survival.