

1 At the end of a thoughtful article on the future of nuclear war, J.B. Wiesner and H.F. York concluded that: "Both sides in
2 the arms race are...confronted by the dilemma of steadily increasing military power and steadily decreasing national
3 security. It is our considered professional judgment that this dilemma has no technical solution. If the great powers
4 continue to look for solutions in the area of science and technology only, the result will be to worsen the situation." [1]

5 I would like to focus your attention not on the subject of the article (national security in a nuclear world) but on the kind
6 of conclusion they reached, namely that there is no technical solution to the problem. An implicit and almost universal
7 assumption of discussions published in professional and semipopular scientific journals is that the problem under
8 discussion has a technical solution. A technical solution may be defined as one that requires a change only in the
9 techniques of the natural sciences, demanding little or nothing in the way of change in human values or ideas of morality.

10 In our day (though not in earlier times) technical solutions are always welcome. Because of previous failures in prophecy,
11 it takes courage to assert that a desired technical solution is not possible. Wiesner and York exhibited this courage;
12 publishing in a science journal, they insisted that the solution to the problem was not to be found in the natural sciences.
13 They cautiously qualified their statement with the phrase, "It is our considered professional judgment..." Whether they
14 were right or not is not the concern of the present article. Rather, the concern here is with the important concept of a class
15 of human problems which can be called "no technical solution problems," and more specifically, with the identification
16 and discussion of one of these.

17 It is easy to show that the class is not a null class. Recall the game of tick-tack-toe. Consider the problem, "How can I win
18 the game of tick-tack-toe?" It is well known that I cannot, if I assume (in keeping with the conventions of game theory)
19 that my opponent understands the game perfectly. Put another way, there is no "technical solution" to the problem. I can
20 win only by giving a radical meaning to the word "win." I can hit my opponent over the head; or I can falsify the records.
21 Every way in which I "win" involves, in some sense, an abandonment of the game, as we intuitively understand it. (I can
22 also, of course, openly abandon the game refuse to play it. This is what most adults do.)

23 The class of "no technical solution problems" has members. My thesis is that the "population problem," as conventionally
24 conceived, is a member of this class. How it is conventionally conceived needs some comment. It is fair to say that most
25 people who anguish over the population problem are trying to find a way to avoid the evils of overpopulation without
26 relinquishing any of the privileges they now enjoy. They think that farming the seas or developing new strains of wheat
27 will solve the problem technologically. I try to show here that the solution they seek cannot be found. The population
28 problem cannot be solved in a technical way, any more than can the problem of winning the game of tick-tack-toe.

29 **What Shall We Maximize?**

30 Population, as Malthus said, naturally tends to grow "geometrically," or, as we would now say, exponentially. In a finite
31 world this means that the per-capita share of the world's goods must decrease. Is ours a finite world?

32 A fair defense can be put forward for the view that the world is infinite or that we do not know that it is not. But, in terms
33 of the practical problems that we must face in the next few generations with the foreseeable technology, it is clear that we
34 will greatly increase human misery if we do not, during the immediate future, assume that the world available to the
35 terrestrial human population is finite. "Space" is no escape. [2]

36 A finite world can support only a finite population; therefore, population growth must eventually equal zero. (The case of
37 perpetual wide fluctuations above and below zero is a trivial variant that need not be discussed.) When this condition is
38 met, what will be the situation of mankind? Specifically, can Bentham's goal of "the greatest good for the greatest
39 number" be realized?

40 No for two reasons, each sufficient by itself. The first is a theoretical one. It is not mathematically possible to maximize
41 for two (or more) variables at the same time. This was clearly stated by von Neumann and Morgenstern, [3] but the
42 principle is implicit in the theory of partial differential equations, dating back at least to D'Alembert (1717-1783).

1 The second reason springs directly from biological facts. To live, any organism must have a source of energy (for
2 example, food). This energy is utilized for two purposes: mere maintenance and work. For man maintenance of life
3 requires about 1600 kilocalories a day ("maintenance calories"). Anything that he does over and above merely staying
4 alive will be defined as work, and is supported by "work calories" which he takes in. Work calories are used not only for
5 what we call work in common speech; they are also required for all forms of enjoyment, from swimming and automobile
6 racing to playing music and writing poetry. If our goal is to maximize population it is obvious what we must do: We must
7 make the work calories per person approach as close to zero as possible. No gourmet meals, no vacations, no sports, no
8 music, no literature, no art...I think that everyone will grant, without argument or proof, that maximizing population does
9 not maximize goods. Bentham's goal is impossible.

10 In reaching this conclusion I have made the usual assumption that it is the acquisition of energy that is the problem. The
11 appearance of atomic energy has led some to question this assumption. However, given an infinite source of energy,
12 population growth still produces an inescapable problem. The problem of the acquisition of energy is replaced by the
13 problem of its dissipation, as J. H. Fremlin has so wittily shown. [4] The arithmetic signs in the analysis are, as it were,
14 reversed; but Bentham's goal is unobtainable.

15 The optimum population is, then, less than the maximum. The difficulty of defining the optimum is enormous; so far as I
16 know, no one has seriously tackled this problem. Reaching an acceptable and stable solution will surely require more than
17 one generation of hard analytical work and much persuasion.

18 We want the maximum good per person; but what is good? To one person it is wilderness, to another it is ski lodges for
19 thousands. To one it is estuaries to nourish ducks for hunters to shoot; to another it is factory land. Comparing one good
20 with another is, we usually say, impossible because goods are incommensurable. Incommensurables cannot be compared.

21 Theoretically this may be true; but in real life incommensurables are commensurable. Only a criterion of judgment and a
22 system of weighting are needed. In nature the criterion is survival. Is it better for a species to be small and hideable, or
23 large and powerful? Natural selection commensurates the incommensurables. The compromise achieved depends on a
24 natural weighting of the values of the variables.

25 Man must imitate this process. There is no doubt that in fact he already does, but unconsciously. It is when the hidden
26 decisions are made explicit that the arguments begin. The problem for the years ahead is to work out an acceptable theory
27 of weighting. Synergistic effects, nonlinear variation, and difficulties in discounting the future make the intellectual
28 problem difficult, but not (in principle) insoluble.

29 Has any cultural group solved this practical problem at the present time, even on an intuitive level? One simple fact
30 proves that none has: there is no prosperous population in the world today that has, and has had for some time, a growth
31 rate of zero. Any people that has intuitively identified its optimum point will soon reach it, after which its growth rate
32 becomes and remains zero.

33 Of course, a positive growth rate might be taken as evidence that a population is below its optimum. However, by any
34 reasonable standards, the most rapidly growing populations on earth today are (in general) the most miserable. This
35 association (which need not be invariable) casts doubt on the optimistic assumption that the positive growth rate of a
36 population is evidence that it has yet to reach its optimum.

37 We can make little progress in working toward optimum population size until we explicitly exorcize the spirit of Adam
38 Smith in the field of practical demography. In economic affairs, *The Wealth of Nations* (1776) popularized the "invisible
39 hand," the idea that an individual who "intends only his own gain," is, as it were, "led by an invisible hand to
40 promote...the public interest." [5] Adam Smith did not assert that this was invariably true, and perhaps neither did any of
41 his followers. But he contributed to a dominant tendency of thought that has ever since interfered with positive action
42 based on rational analysis, namely, the tendency to assume that decisions reached individually will, in fact, be the best
43 decisions for an entire society. If this assumption is correct it justifies the continuance of our present policy of *laissez*
44 *faire* in reproduction. If it is correct we can assume that men will control their individual fecundity so as to produce the
45 optimum population. If the assumption is not correct, we need to reexamine our individual freedoms to see which ones

1 are defensible.

2 **Tragedy of Freedom in a Commons**

3 The rebuttal to the invisible hand in population control is to be found in a scenario first sketched in a little-known
4 Pamphlet in 1833 by a mathematical amateur named William Forster Lloyd (1794-1852). [6] We may well call it "the
5 tragedy of the commons," using the word "tragedy" as the philosopher Whitehead used it [7]: "The essence of dramatic
6 tragedy is not unhappiness. It resides in the solemnity of the remorseless working of things." He then goes on to say,
7 "This inevitableness of destiny can only be illustrated in terms of human life by incidents which in fact involve
8 unhappiness. For it is only by them that the futility of escape can be made evident in the drama."

9 The tragedy of the commons develops in this way. Picture a pasture open to all. It is to be expected that each herdsman
10 will try to keep as many cattle as possible on the commons. Such an arrangement may work reasonably satisfactorily for
11 centuries because tribal wars, poaching, and disease keep the numbers of both man and beast well below the carrying
12 capacity of the land. Finally, however, comes the day of reckoning, that is, the day when the long-desired goal of social
13 stability becomes a reality. At this point, the inherent logic of the commons remorselessly generates tragedy.

14 As a rational being, each herdsman seeks to maximize his gain. Explicitly or implicitly, more or less consciously, he asks,
15 "What is the utility to me of adding one more animal to my herd?" This utility has one negative and one positive
16 component.

17 1. The positive component is a function of the increment of one animal. Since the herdsman receives all the proceeds
18 from the sale of the additional animal, the positive utility is nearly +1. [Thus, presuming the existence of a monetary
19 relation between human beings.]

20 2. The negative component is a function of the additional overgrazing created by one more animal. Since, however, the
21 effects of overgrazing are shared by all the herdsmen, the negative utility for any particular decision-making herdsman is
22 only a fraction of -1.

23 Adding together the component partial utilities, the rational herdsman concludes that the only sensible course for him to
24 pursue is to add another animal to his herd. And another.... But this is the conclusion reached by each and every rational
25 herdsman sharing a commons. Therein is the tragedy. Each man is locked into a system that compels him to increase his
26 herd without limit in a world that is limited. Ruin is the destination toward which all men rush, each pursuing his own
27 best interest in a society that believes in the freedom of the commons. Freedom in a commons brings ruin to all.

28 Some would say that this is a platitude. Would that it were! In a sense, it was learned thousands of years ago, but natural
29 selection favors the forces of psychological denial. [8] The individual benefits as an individual from his ability to deny
30 the truth even though society as a whole, of which he is a part, suffers. Education can counteract the natural tendency to
31 do the wrong thing, but the inexorable succession of generations requires that the basis for this knowledge be constantly
32 refreshed.

33 A simple incident that occurred a few years ago in Leominster, Massachusetts shows how perishable the knowledge is.
34 During the Christmas shopping season the parking meters downtown were covered with plastic bags that bore tags
35 reading: "Do not open until after Christmas. Free parking courtesy of the mayor and city council." In other words, facing
36 the prospect of an increased demand for already scarce space, the city fathers reinstated the system of the commons.
37 (Cynically, we suspect that they gained more votes than they lost by this retrogressive act.)

38 In an approximate way, the logic of the commons has been understood for a long time, perhaps since the discovery of
39 agriculture or the invention of private property in real estate. But it is understood mostly only in special cases which are
40 not sufficiently generalized. Even at this late date, cattlemen leasing national land on the Western ranges demonstrate no
41 more than an ambivalent understanding, in constantly pressuring federal authorities to increase the head count to the
42 point where overgrazing produces erosion and weed-dominance. Likewise, the oceans of the world continue to suffer
43 from the survival of the philosophy of the commons. Maritime nations still respond automatically to the shibboleth of the

1 "freedom of the seas." Professing to believe in the "inexhaustible resources of the oceans," they bring species after
2 species of fish and whales closer to extinction. [9]

3 The National Parks present another instance of the working out of the tragedy of the commons. At present, they are open
4 to all, without limit. The parks themselves are limited in extent -- there is only one Yosemite Valley whereas population
5 seems to grow without limit. The values that visitors seek in the parks are steadily eroded. Plainly, we must soon cease to
6 treat the parks as commons or they will be of no value to anyone.

7 What shall we do? We have several options. We might sell them off as private property. We might keep them as public
8 property, but allocate the right to enter them. The allocation might be on the basis of wealth, by the use of an auction
9 system. It might be on the basis of merit, as defined by some agreed-upon standards. It might be by lottery. Or it might
10 be on a first-come, first-served basis, administered to long queues. These, I think, are all objectionable. But we must
11 choose -- or acquiesce in the destruction of the commons that we call our National Parks.

12 **Pollution**

13 In a reverse way, the tragedy of the commons reappears in problems of pollution. Here it is not a question of taking
14 something out of the commons, but of putting something in -- sewage, or chemical, radioactive, and heat wastes into
15 water; noxious and dangerous fumes into the air; and distracting and unpleasant advertising signs into the line of sight.
16 The calculations of utility are much the same as before. The rational man finds that his share of the cost of the wastes he
17 discharges into the commons is less than the cost of purifying his wastes before releasing them. Since this is true for
18 everyone, we are locked into a system of "fouling our own nest," so long as we behave only as independent, rational, free
19 enterprisers.

20 The tragedy of the commons as a food basket is averted by private property, or something formally like it. But the air and
21 waters surrounding us cannot readily be fenced, and so the tragedy of the commons as a cesspool must be prevented by
22 different means, by coercive laws or taxing devices that make it cheaper for the polluter to treat his pollutants than to
23 discharge them untreated. We have not progressed as far with the solution of this problem as we have with the first.
24 Indeed, our particular concept of private property, which deters us from exhausting the positive resources of the earth,
25 favors pollution. The owner of a factory on the bank of a stream whose property extends to the middle of the stream
26 often has difficulty seeing why it is not his natural right to muddy the waters flowing past his door. The law, always
27 behind the times, requires elaborate stitching and fitting to adapt it to this newly perceived aspect of the commons.

28 The pollution problem is a consequence of population. It did not much matter how a lonely American frontiersman
29 disposed of his waste. "Flowing water purifies itself every ten miles," my grandfather used to say, and the myth was near
30 enough to the truth when he was a boy, for there were not too many people. But as population became denser, the natural
31 chemical and biological recycling processes became overloaded, calling for a redefinition of property rights.

32 **How to Legislate Temperance?**

33 Analysis of the pollution problem as a function of population density uncovers a not generally recognized principle of
34 morality, namely: the morality of an act is a function of the state of the system at the time it is performed. [10] Using the
35 commons as a cesspool does not harm the general public under frontier conditions, because there is no public; the same
36 behavior in a metropolis is unbearable. A hundred and fifty years ago a plainsman could kill an American bison, cut out
37 only the tongue for his dinner, and discard the rest of the animal. He was not in any important sense being wasteful.
38 Today, with only a few thousand bison left, we would be appalled at such behavior.

39 In passing, it is worth noting that the morality of an act cannot be determined from a photograph. One does not know
40 whether a man killing an elephant or setting fire to the grassland is harming others until one knows the total system in
41 which his act appears. "One picture is worth a thousand words," said an ancient Chinese; but it may take ten thousand
42 words to validate it. It is as tempting to ecologists as it is to reformers in general to try to persuade others by way of the
43 photographic shortcut. But the essence of an argument cannot be photographed: it must be presented rationally -- in
44 words.

1 That morality is system-sensitive escaped the attention of most codifiers of ethics in the past. "Thou shalt not..." is the
2 form of traditional ethical directives which make no allowance for particular circumstances. The laws of our society
3 follow the pattern of ancient ethics, and therefore are poorly suited to governing a complex, crowded, changeable world.
4 Our epicyclic solution is to augment statutory law with administrative law. Since it is practically impossible to spell out
5 all the conditions under which it is safe to burn trash in the back yard or to run an automobile without smog-control, by
6 law we delegate the details to bureaus. The result is administrative law, which is rightly feared for an ancient reason --
7 Quis custodiet ipsos custodes? -- Who shall watch the watchers themselves? John Adams said that we must have a
8 "government of laws and not men." Bureau administrators, trying to evaluate the morality of acts in the total system, are
9 singularly liable to corruption, producing a government by men, not laws.

10 Prohibition is easy to legislate (though not necessarily to enforce); but how do we legislate temperance? Experience
11 indicates that it can be accomplished best through the mediation of administrative law. We limit possibilities
12 unnecessarily if we suppose that the sentiment of Quis custodiet denies us the use of administrative law. We should rather
13 retain the phrase as a perpetual reminder of fearful dangers we cannot avoid. The great challenge facing us now is to
14 invent the corrective feedbacks that are needed to keep custodians honest. We must find ways to legitimate the needed
15 authority of both the custodians and the corrective feedbacks.

16 **Freedom to Breed Is Intolerable**

17 The tragedy of the commons is involved in population problems in another way. In a world governed solely by the
18 principle of "dog eat dog" -- if indeed there ever was such a world -- how many children a family had would not be a
19 matter of public concern. Parents who bred too exuberantly would leave fewer descendants, not more, because they
20 would be unable to care adequately for their children. David Lack and others have found that such a negative feedback
21 demonstrably controls the fecundity of birds. [11] But men are not birds, and have not acted like them for millenniums, at
22 least.

23 If each human family were dependent only on its own resources; if the children of improvident parents starved to death; if
24 thus, over breeding brought its own "punishment" to the germ line then there would be no public interest in controlling
25 the breeding of families. But our society is deeply committed to the welfare state, [12] and hence is confronted with
26 another aspect of the tragedy of the commons.

27 In a welfare state, how shall we deal with the family, the religion, the race, or the class (or indeed any distinguishable and
28 cohesive group) that adopts over breeding as a policy to secure its own aggrandizement? [13] To couple the concept of
29 freedom to breed with the belief that everyone born has an equal right to the commons is to lock the world into a tragic
30 course of action.

31 Unfortunately this is just the course of action that is being pursued by the United Nations. In late 1967, some thirty
32 nations agreed to the following: "The Universal Declaration of Human Rights describes the family as the natural and
33 fundamental unit of society. It follows that any choice and decision with regard to the size of the family must irrevocably
34 rest with the family itself, and cannot be made by anyone else." [14]

35 It is painful to have to deny categorically the validity of this right; denying it, one feels as uncomfortable as a resident of
36 Salem, Massachusetts, who denied the reality of witches in the seventeenth century. At the present time, in liberal
37 quarters, something like a taboo acts to inhibit criticism of the United Nations. There is a feeling that the United Nations
38 is "our last and best hope," that we shouldn't find fault with it; we shouldn't play into the hands of the archconservatives.
39 However, let us not forget what Robert Louis Stevenson said: "The truth that is suppressed by friends is the readiest
40 weapon of the enemy." If we love the truth we must openly deny the validity of the Universal Declaration of Human
41 Rights, even though it is promoted by the United Nations. We should also join with Kingsley Davis [15] in attempting to
42 get Planned Parenthood-World Population to see the error of its ways in embracing the same tragic ideal.

43 **Conscience Is Self-Eliminating**

44 It is a mistake to think that we can control the breeding of mankind in the long run by an appeal to conscience. Charles

1 Galton Darwin made this point when he spoke on the centennial of the publication of his grandfather's great book. The
2 argument is straightforward and Darwinian.

3 People vary. Confronted with appeals to limit breeding, some people will undoubtedly respond to the plea more than
4 others. Those who have more children will produce a larger fraction of the next generation than those with more
5 susceptible consciences. The differences will be accentuated, generation by generation. [Unless society divides itself into
6 those still enmeshed in market individualism, and those who consciously embrace the great change, with a greater
7 sustainability accruing to those latter whose cooperation is at the level of spiritual identification and whose emotional
8 necessity for the extended family has been replaced through that identification.]

9 In C. G. Darwin's words: "It may well be that it would take hundreds of generations for the progenitive instinct to develop
10 in this way, but if it should do so, nature would have taken her revenge, and the variety *Homo contracipiens* would
11 become extinct and would be replaced by the variety *Homo progenitivus*. [16]

12 The argument assumes that conscience or the desire for children (no matter which) is hereditary-but hereditary only in the
13 most general formal sense. The result will be the same whether the attitude is transmitted through germ cells, or
14 exosomatically, to use A. J. Lotka's term. (If one denies the latter possibility as well as the former, then what's the point
15 of education?) The argument has here been stated in the context of the population problem, but it applies equally well to
16 any instance in which society appeals to an individual exploiting a commons to restrain himself for the general good – by
17 means of his conscience. To make such an appeal is to set up a selective system that works toward the elimination of
18 conscience from the race.

19 **Pathogenic Effects of Conscience**

20 The long-term disadvantage of an appeal to conscience should be enough to condemn it; but it has serious short-term
21 disadvantages as well. If we ask a man who is exploiting a commons to desist "in the name of conscience," what are we
22 saying to him? What does he hear? – not only at the moment but also in the wee small hours of the night when, half
23 asleep, he remembers not merely the words we used but also the nonverbal communication cues we gave him unawares?
24 Sooner or later, consciously or subconsciously, he senses that he has received two communications, and that they are
25 contradictory:

- 26 1. (intended communication) "If you don't do as we ask, we will openly condemn you for not acting like a
27 responsible citizen";
- 28 2. (the unintended communication) "If you do behave as we ask, we will secretly condemn you for a
29 simpleton who can be shamed into standing aside while the rest of us exploit the commons."

30 Every man then is caught in what Bateson has called a "double bind." Bateson and his co-workers have made a plausible
31 case for viewing the double bind as an important causative factor in the genesis of schizophrenia. [17] The double bind
32 may not always be so damaging, but it always endangers the mental health of anyone to whom it is applied. "A bad
33 conscience," said Nietzsche, "is a kind of illness."

34 To conjure up a conscience in others is tempting to anyone who wishes to extend his control beyond the legal limits.
35 Leaders at the highest level succumb to this temptation. Has any president during the past generation failed to call on
36 labor unions to moderate voluntarily their demands for higher wages, or to steel companies to honor voluntary guidelines
37 on prices? I can recall none. The rhetoric used on such occasions is designed to produce feelings of guilt in
38 noncooperators.

39 For centuries it was assumed without proof that guilt was a valuable, perhaps even an indispensable, ingredient of the
40 civilized life. Now, in this post-Freudian world, we doubt it.

41 Paul Goodman speaks from the modern point of view when he says: "No good has ever come from feeling guilty, neither
42 intelligence, policy, nor compassion. The guilty do not pay attention to the object but only to themselves, and not even to
43 their own interests, which might make sense, but to their anxieties." [18]

1 One does not have to be a professional psychiatrist to see the consequences of anxiety. We in the Western world are just
2 emerging from a dreadful two centuries-long Dark Ages of Eros that was sustained partly by prohibition laws, but
3 perhaps more effectively by the anxiety-generating mechanisms of education. Alex Comfort has told the story well in *The*
4 *Anxiety Makers*; [19] it is not a pretty one.

5 Since proof is difficult, we may even concede that the results of anxiety may sometimes, from certain points of view, be
6 desirable. The larger question we should ask is whether, as a matter of policy, we should ever encourage the use of a
7 technique the tendency (if not the intention) of which is psychologically pathogenic. We hear much talk these days of
8 responsible parenthood; the coupled words are incorporated into the titles of some organizations devoted to birth control.
9 Some people have proposed massive propaganda campaigns to instill responsibility into the nation's (or the world's)
10 breeders. But what is the meaning of the word conscience? When we use the word responsibility in the absence of
11 substantial sanctions are we not trying to browbeat a free man in a commons into acting against his own interest?
12 Responsibility is a verbal counterfeit for a substantial quid pro quo. It is an attempt to get something for nothing.

13 If the word responsibility is to be used at all, I suggest that it be in the sense Charles Frankel uses it. [20]
14 "Responsibility," says this philosopher, "is the product of definite social arrangements." Notice that Frankel calls for
15 social arrangements not propaganda.

16 **Mutual Coercion Mutually Agreed Upon**

17 The social arrangements that produce responsibility are arrangements that create coercion, of some sort. Consider bank
18 robbing. The man who takes money from a bank acts as if the bank were a commons. How do we prevent such action?
19 Certainly not by trying to control his behavior solely by a verbal appeal to his sense of responsibility. Rather than rely on
20 propaganda we follow Frankel's lead and insist that a bank is not a commons; we seek the definite social arrangements
21 that will keep it from becoming a commons. That we thereby infringe on the freedom of would-be robbers we neither
22 deny nor regret.

23 The morality of bank robbing is particularly easy to understand because we accept complete prohibition of this activity.
24 We are willing to say "Thou shalt not rob banks," without providing for exceptions. But temperance also can be created
25 by coercion. Taxing is a good coercive device. To keep downtown shoppers temperate in their use of parking space we
26 introduce parking meters for short periods, and traffic fines for longer ones. We need not actually forbid a citizen to park
27 as long as he wants to; we need merely make it increasingly expensive for him to do so. Not prohibition, but carefully
28 biased options are what we offer him. A Madison Avenue man might call this persuasion; I prefer the greater candor of
29 the word coercion.

30 Coercion is a dirty word to most liberals now, but it need not forever be so. As with the four-letter words, its dirtiness can
31 be cleansed away by exposure to the light, by saying it over and over without apology or embarrassment. To many, the
32 word coercion implies arbitrary decisions of distant and irresponsible bureaucrats; but this is not a necessary part of its
33 meaning. The only kind of coercion I recommend is mutual coercion, mutually agreed upon by the majority of the people
34 affected.

35 To say that we mutually agree to coercion is not to say that we are required to enjoy it, or even to pretend we enjoy it.
36 Who enjoys taxes? We all grumble about them. But we accept compulsory taxes because we recognize that voluntary
37 taxes would favor the conscienceless. We institute and (grumblingly) support taxes and other coercive devices to escape
38 the horror of the commons.

39 An alternative to the commons need not be perfectly just to be preferable. With real estate and other material goods, the
40 alternative we have chosen is the institution of private property coupled with legal inheritance. Is this system perfectly
41 just? As a genetically trained biologist I deny that it is. It seems to me that, if there are to be differences in individual
42 inheritance, legal possession should be perfectly correlated with biological inheritance—that those who are biologically
43 more fit to be the custodians of property and power should legally inherit more. But genetic recombination continually
44 makes a mockery of the doctrine of "like father, like son" implicit in our laws of legal inheritance. An idiot can inherit
45 millions, and a trust fund can keep his estate intact. We must admit that our legal system of private property plus

1 inheritance is unjust -- but we put up with it because we are not convinced, at the moment, that anyone has invented a
2 better system. The alternative of the commons is too horrifying to contemplate. Injustice is preferable to total ruin. [With
3 the type of consciousness that is now encouraged among human beings by the economic system, this is true. Whether that
4 system will be capable of carrying us into the future is the crux of the question. Can we evolve unto a consciousness that
5 is capable of managing the commons, even if it may only be done with a much lesser population?]

6 It is one of the peculiarities of the warfare between reform and the status quo that it is thoughtlessly governed by a double
7 standard. Whenever a reform measure is proposed it is often defeated when its opponents triumphantly discover a flaw in
8 it. As Kingsley Davis has pointed out, [21] worshipers of the status quo sometimes imply that no reform is possible
9 without unanimous agreement, an implication contrary to historical fact. As nearly as I can make out, automatic rejection
10 of proposed reforms is based on one of two unconscious assumptions: (1) that the status quo is perfect; or (2) that the
11 choice we face is between reform and no action; if the proposed reform is imperfect, we presumably should take no
12 action at all, while we wait for a perfect proposal.

13 But we can never do nothing. That which we have done for thousands of years is also action. It also produces evils. Once
14 we are aware that the status quo is action, we can then compare its discoverable advantages and disadvantages with the
15 predicted advantages and disadvantages of the proposed reform, discounting as best we can for our lack of experience.
16 On the basis of such a comparison, we can make a rational decision which will not involve the unworkable assumption
17 that only perfect systems are tolerable.

18 **Recognition of Necessity**

19 Perhaps the simplest summary of this analysis of man's population problems is this: the commons, if justifiable at all, is
20 justifiable only under conditions of low-population density. As the human population has increased, the commons has
21 had to be abandoned in one aspect after another.

22 First we abandoned the commons in food gathering, enclosing farm land and restricting pastures and hunting and fishing
23 areas. These restrictions are still not complete throughout the world.

24 Somewhat later we saw that the commons as a place for waste disposal would also have to be abandoned. Restrictions on
25 the disposal of domestic sewage are widely accepted in the Western world; we are still struggling to close the commons
26 to pollution by automobiles, factories, insecticide sprayers, fertilizing operations, and atomic energy installations.

27 In a still more embryonic state is our recognition of the evils of the commons in matters of pleasure. There is almost no
28 restriction on the propagation of sound waves in the public medium. The shopping public is assaulted with mindless
29 music, without its consent. Our government has paid out billions of dollars to create a supersonic transport which would
30 disturb 50,000 people for every one person whisked from coast to coast 3 hours faster. Advertisers muddy the airwaves of
31 radio and television and pollute the view of travelers. We are a long way from outlawing the commons in matters of
32 pleasure. Is this because our Puritan inheritance makes us view pleasure as something of a sin, and pain (that is, the
33 pollution of advertising) as the sign of virtue?

34 Every new enclosure of the commons involves the infringement of somebody's personal liberty. Infringements made in
35 the distant past are accepted because no contemporary complains of a loss. It is the newly proposed infringements that we
36 vigorously oppose; cries of "rights" and "freedom" fill the air. But what does "freedom" mean? When men mutually
37 agreed to pass laws against robbing, mankind became more free, not less so. Individuals locked into the logic of the
38 commons are free only to bring on universal ruin; once they see the necessity of mutual coercion, they become free to
39 pursue other goals. I believe it was Hegel who said, "Freedom is the recognition of necessity."

40 The most important aspect of necessity that we must now recognize, is the necessity of abandoning the commons in
41 breeding. No technical solution can rescue us from the misery of overpopulation. Freedom to breed will bring ruin to all.
42 At the moment, to avoid hard decisions many of us are tempted to propagandize for conscience and responsible
43 parenthood. The temptation must be resisted, because an appeal to independently acting consciences selects for the
44 disappearance of all conscience in the long run, and an increase in anxiety in the short.

1 The only way we can preserve and nurture other and more precious freedoms is by relinquishing the freedom to breed,
2 and that very soon. "Freedom is the recognition of necessity" -- and it is the role of education to reveal to all the necessity
3 of abandoning the freedom to breed. Only so, can we put an end to this aspect of the tragedy of the commons.

4 [There is more than one form of mutual coercion; mutually agreed upon. There is the imposition from above by
5 government with various degrees of forcefulness, ranging from mandatory slaughter of the unwanted to fiscal incentives
6 and media presented persuasion. There is the empowering of woman which derives from her full knowledge of the global
7 consequences of overpopulation and concurrent liberation from the biological consequences of the marriage bed, now so
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