

The Tragedy of the *Unmanaged Commons*: population and the disguises of Providence

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THE COMPLEX of concerns we blanket with the name 'the population problem' has been with us for almost two hundred years. Any 'problem' that persists that long without resolution should lead us to suspect subconscious resistances. In this instance a major resistance is, I think, centered around the concept of Providence. We would do well to look into the origin and variations of this concept.

The word 'Providence' was much used in the eighteenth century, but it is seldom heard now. Nonetheless, the idea behind the word still plays a role in shaping people's thoughts. There seems to be an almost irreducible hunger for this supportive idea. Psychoanalytically speaking, this hunger is no mystery: each of us starts life as a helpless little being to whom all the essentials must be supplied. It is natural and necessary that an infant should expect to be provided for. As we develop we outgrow some of these expectations; but under stress, or when puzzled, we may relapse into an infantile attitude of expecting Providence (under whatever name) to take care of us.

The Latin word *providere* means to see ahead, hence to provide for. As the word 'God' became somewhat unfashionable in the eighteenth century, 'Providence' became its surrogate. The psychoanalytic weight of the two words is much the same. This century was later labeled 'the Enlightenment' by those who approved the change.

In the same century another substitution was made, as Robert Nisbet tells us.¹ Turgot, one of the seminal minds of the time, made

the personal transition in less than a year. In July of 1750, in a public address at the Sorbonne, Turgot praised the idea of Providence as one of Christianity's great gifts to the world. But by December of the same year he had decided that the idea of progress (which also has ancient roots) was far more deserving of admiration. As Nisbet says: 'with respect to the idea of progress, Turgot, without abandoning the structure or framework of his first address at the Sorbonne, secularized it.'

Progress — a secularized version of Providence — soon came to mean principally *technological* progress. A new faith developed: 'Technology will solve our problems.' This is surely a providential idea. The emotional appeal is the same; the hunger is the same. As the acknowledged historian of progress, J. B. Bury, says: 'it was just the theory of an active Providence that the theory of Progress was to replace; and it was not till men felt independent of Providence that they could organise a theory of Progress.'² We note that in 1751, after he had abandoned Providence for Progress, Turgot renounced his ecclesiastical ambitions.

At the end of the same decade, in *The Theory of Moral Sentiments*, Adam Smith gave memorable form to another providential idea:

The rich . . . , though they mean only their own conveniency, though the sole end which they propose be the gratification of their own vain and insatiable desires, . . . divide with the poor the produce of all their improvements. They are led by an invisible hand to make nearly the same distribution of the necessaries of life which would have been made had the earth been divided into equal portions among all its inhabitants; and thus, without intending it, without knowing it, advance the interests of society . . .³

Adam Smith's 'invisible hand' is, of course, a figure of speech. Note his clever salesmanship in tying the argument to what would, two centuries later, be called the 'trickle-down' theory of distribution, thus easing the pain of accepting what looks at first like wholly selfish behaviour. The selfish entrepreneur, though he intends only his own good (said Smith), nevertheless acts for the benefit of all society. Such is the faith of *laissez-faire*; it is surely a providential idea. Seventeen years later Adam Smith developed it more fully in his classic text, *The Wealth of Nations*.

Other men added rhetorical embellishments. Ten years before

Smith's classic work, La Riviere asserted that laissez-faire produced *l'ordre naturel*. Then, as now, the word 'natural' enjoyed prestige. In 1810 David Ricardo, in *The High Price of Bullion*, claimed that 'Where there is free competition, the interests of the individual and that of the community are *never* at variance.'⁴ I have italicized the word 'never' to call attention to several points. First, italics suggest the authority Ricardo was trying to bestow on the idea. Second, the claim of an invariable correlation of individual and community interests is one that was easily accepted by economists, though it was, as we shall see, denied by many serious students of population, beginning with Malthus. Lastly, for many economists laissez-faire became something of a religious belief, a ready substitute for 'Providence'.

Pursuing the history of ideas to their earliest origins one finds the germ of laissez-faire in the writings of Chuang Tzu of the fourth century B.C.: 'Good order results spontaneously when things are left alone.'⁵ Of course few in eighteenth century Europe were aware of what had been thought in China two millennia earlier. Following the idea of 'spontaneous order' all the way to the present we find that the Nobel economist F. A. Hayek, in a book published in 1988, echoes Chuang Tzu, matching the unqualified praise of Ricardo: 'Order generated without design can far outstrip plans men consciously contrive.'⁶

Few biologists would argue with that assertion: but what is explicitly said hardly justifies that which the author no doubt hopes the reader will infer, namely that human beings can *never* improve on nature. Even if human-generated order is usually a poor match for nature's designs it does not follow that economic libertarians are wise in holding that humanity should renounce all foresight, all planning and all intervention in the order of nature.

The Utterly Dismal Theorem

The congruence of self-interest and community interest implied by laissez-faire was a comforting one to the people of the late eighteenth century. Into this complacent world burst Malthus with his assertion that, when population is involved, laissez-faire reproduction does not automatically produce a pleasant world. Unhindered reproduc-

tion, he said, causes the population to increase 'geometrically' ('exponentially,' we say now), while the means of subsistence increases only arithmetically. Reproduction can easily outrun food production.

Malthus was right in the first assertion: in the absence of 'environmental resistance' exponential reproduction is the innate result of all healthy living. We can hardly imagine a different biology. But Malthus' belief that subsistence increases arithmetically has no basis in fact. There is no general law that predicts the rate at which the human species improves the technology with which the environment is exploited. Later commentators suggested that Malthus was dimly aware of the principle of 'diminishing returns.' Malthus denied this explanation. The dispute need not detain us here.

It is manifestly clear that Malthus's theory does not lead to the attainment of happiness through laissez-faire reproduction. This conclusion has been expressed unequivocally in our time by another economist, Kenneth Boulding. He first describes Malthus's 'famous dismal theorem of economics' which he summarizes in these words:

... if the only check on the growth of population is starvation and misery, then no matter how favorable the environment or how advanced the technology the population will grow until it is miserable and starves. The theorem, indeed, has a worse corollary which has been described as the utterly dismal theorem. This is the proposition that if the only check on the growth of population is starvation and misery, then any technological improvement will have the ultimate effect of increasing the sum of human misery, as it permits a larger population to live in precisely the same state of misery and starvation as before ...⁷

In spite of its pessimistic cast the *Essay* of Malthus was given a favourable reception when it first appeared. But its hard-headed approach to human problems was better suited to the century of the Enlightenment than it was to the succeeding Romantic century. A determined and continuing search was made for 'softer' mechanisms than the 'misery and vice' that Malthus proposed as the great controllers of population size. In 1832 (two years before the death of Malthus) one Thomas Rowe Edmonds put forward an interesting theory:

Amongst the great body of the people at the present moment, sexual intercourse is the only gratification; and thus, by a most unfortunate

concurrence of adverse circumstances, population goes on augmenting at a period when it ought to be restrained . . . When [the working class] are better fed they will have other enjoyments at command than sexual intercourse, and their numbers, therefore, will not increase in the same proportion as at present.⁸

Society should make the poor rich, advised Edmonds, so that they will have better things to do with their free time than entertain one another as animals do. This recommendation was no doubt favourably received by many Victorians, who — publicly at any rate — deprecated sexual intercourse. The substitution theory even surfaced more than a century later when it was suggested that television sets be put in every village in India, so that villagers would discover that other recreations are more enjoyable than 'doin' what comes naturally.' Many villages in the Third World now have television sets, but the predicted effect on human fertility has failed to make its appearance.

Ten years after Edmonds' ill-starred proposal Thomas Doubleday put forward another:

It is a fact, admitted by all gardeners as well as botanists, that if a tree, plant, or flower, be placed in mould, either naturally or artificially made too rich for it, a plethoric state is produced, and fruitfulness ceases . . . There cannot be a doubt that, with the animal creation . . . fecundity is totally checked by the plethoric state . . . the doe, or female rabbit, and . . . the sow will *not* conceive if fed to a certain height of fatness . . . leanness is indispensable to conception . . .⁹

Is it true that fertility is inversely correlated with the quality of the diet? Doubleday's thesis of 1842 became a priori suspect when Darwin published his theory of evolution in 1859. Natural selection has the automatic effect of making good (though unconscious) economizers of all species. It makes Darwinian sense for individuals to convert an increase in food into an increase in progeny; a species that became more fertile under starvation conditions would imperil its survival.

Empirical facts corroborate the evolutionary predictions. In reviewing these it will help to make the distinction that has become standard in demography: *fecundity* is the potentiality for having children, while *fertility* measures the actual production of children. As far as the fecundity of human beings is concerned the effect of

nutrition is beyond controversy. Rose Frisch, a leader in this field of research, has summarized the findings in this way: 'Good nutrition leads to greater weight, more body fat in the female, leading to regular menstruation and higher fecundity, [thus] leading to greater fertility.'¹⁰

The explanation of Doubleday's facts is easily given. The excessive fat of penned-up rabbits and pigs is an artefact of domestication: their relatives in the wild would never achieve such gross fatness, thanks in large part to the regimen of involuntary exercise imposed on them by predators. Natural selection has not had to deal with Doubleday's kind of 'plethoric state.'

From the earliest days students of population have tried to induce desired political changes from scientific facts. Edmonds, for instance, saw the hand of Providence at work: "To better the condition of the labouring classes, that is, to place more food and comforts before them, however paradoxical it may appear, is the wisest mode to check redundancy."¹¹ When Providence works this way it is easy for human beings to cooperate with her. But Frisch's findings point to the opposite conclusion, a fact that disturbs her (and no doubt many others). Of Rose Frisch it has been reported that: 'She expresses concern that her findings on the fat-fertility relationship might be used as 'scientific' documentation of the negative value of sending surplus food to the underfed populations of the world ... She believes "a greater effort is needed to provide contraceptive methods together with adequate nutrition."¹²

The providential bias in population theories has been strong from the earliest days. Going back to 1847 we find that the anonymous translator of the works of a Genevan economist, Sismondi, opined that: 'Sanitary improvements, and whatever tends to lengthen life, are the most effectual means of restraining a too great increase of population.'¹³ By the end of the nineteenth century the tender-hearted view of population dynamics had a firm hold on such influential people as those in the Bloomsbury set. Geoffrey Searle has given a telling description of their position:

Socialists, predisposed to believe that the solution to all difficulties lay in a radical improvement of the social environment, also noted that there was an inverse relationship between fertility and income. From this they deduced that higher wages and better living conditions *automatically*

brought about a reduction in the birth rate. This was the conclusion reached by the Webbs [Sidney and Beatrice] in *Industrial Democracy* [1897], which includes a discussion of differential fertility within the working class. Many other socialists followed the Webbs' lead. Thus, Mrs. Pember Reeves wrote in 1913: '... for those who deplore large families in the case of poor people, it must be a comfort to remember a fact which experience shows us, that as poverty decreases, and as the standard of comfort rises, so does the size of the family diminish. Should we be able to conquer the problem of poverty, we should automatically solve the problem of the excessively large family.'¹⁴

The imputing of the miseries of overpopulation to the actions of injustice was made more explicit in 1952 in the writings of the Brazilian nutritionist, Josué de Castro. In *The Geography of Hunger* he wrote: 'Hunger has been chiefly created by the inhuman exploitation of colonial riches, by the latifundia and one-crop culture which lay waste the colony, so that the exploiting country can take too cheaply the raw materials its prosperous industrial economy requires.'¹⁵

Sadly, Castro reports that 'A large part of the world is not yet convinced of the necessity of doing away with hunger once for all,' which is unfortunate because: 'when all the world's parts are indissolubly linked into one living whole, it is no longer possible to let one region rot and starve without infecting the rest, and threatening the whole world with death.'¹⁶ One can empathize with Castro's intention — namely, to mobilize the indifferent to eradicate hunger from the world — without accepting his hypothesis that hunger is infectious in the same way that microbial diseases are infectious. If hunger spreads from the poor to the rich it is either because the rich are too stupid to manage their own affairs, or because they become infected by the idea of sharing-without-limit. Ideas, even malfunctional ones, *are* infectious.

All of the many causes proposed for overpopulation suffer from the same logical weakness: they assume that correlation equals causation. But correlation can be read in either direction. Mrs. Reeves' assertion that 'as poverty decreases, the size of the family diminishes,' implies that wealth is the *cause* of diminished fertility. Why did she not say, 'as the size of the family diminishes, wealth increases'? In truth, most couples, rich or poor, know that adding another child to their family will, in all probability, diminish their

wealth and well-being. So the hypothesis that fertility *causes* poverty is not an ungrounded speculation. Closer to the truth is the hypothesis that the causal relation of poverty and fertility is a circular one, an increase in either tending to increase the other: a true vicious circle.

Long ago logicians labeled the error of deducing cause from sequence as the *post hoc ergo propter hoc* fallacy. ('After this, therefore because of this.') It's a pity that many scholars continue to fall into this trap. One who did not was Joseph Townsend, an English minister. Commenting on his travels in Spain in 1791 he wrote: 'In a fully peopled country, to say, that no one shall suffer want is absurd. Could you supply their wants, you would soon double their numbers.'¹⁷ Note that this was said eight years before Malthus' *Essay* was published. Was this insight a new discovery of Townsend's? Undoubtedly it was not. It is highly probable that ordinary folk understood this population principle for millennia, but it was not often voiced precisely because 'everybody knew it.' Then after Malthus it seemed too heartless and pessimistic a thought to state in public. The assertion of more providential principles was a surer path to public favor.

Anti-Malthusian hypotheses are legion. The diminution of fertility was, at various times, asserted to follow from: amusements alternative to sex; rich food; excess protein; better sanitation; industrialization; modernization (whatever that is); land reform; social justice; lessening of infant mortality; education; or — according to one's political bias — the adoption of communism or capitalism. The pattern is clear: since the most plausible proposals for controlling population are 'unacceptable,' whoever has the temerity to admit that population might be a problem promptly sees a chance to advance the reform of his choice by asserting that *his* reform is the best way to control population. Providence is in the saddle again.

The less doctrinaire commentators sometimes say that simple wealth is all that is needed to bring down fertility. This raises a question of definition, which is implicit in most of the entries on the reformers' lists. What is wealth, really? Both income and wealth per capita are greater in European countries than they are in the 'Third World' countries. By conventional measures, wealth and fertility are inversely related. But it has been remarked that, in Europe at least, 'a

housing shortage is the best contraceptive.' Can a shortage be a true form of wealth? A young couple reduced to sharing the inadequate apartment of parents cannot agree that this shortage is wealth. As concerns fertility and population matters, the Gross National Product is a gross and inaccurate measure of real wealth. Statistics are tricky.

In the middle of the twentieth century, there appeared a population hypothesis so minimally specified as to be almost mystical in nature, namely the *Benign Demographic Transition*. The initial adjective has here been added to the usual form of the name for reasons that will be made clear presently.

The Benign Demographic Transition

Ignoring short-term fluctuations, the population of Europe was nearly stable for many centuries, with both fertility and mortality at high levels (the rate of each being about 40 per thousand population per year). In the last few centuries both fertility and mortality have fallen, with mortality falling first. The result has been an increase in population. After a delay of some time, fertility also fell. It is reasonable to assume that, sooner or later in a world of limits, the fertility rate must once again equal the mortality rate, but this time at a low level for both. This situation seems to have been reached in some of the Central European countries (Hungary and West Germany, for instance). The *change* from [High Fertility & High Mortality] to [Low Fertility & Low Mortality] is called the *demographic transition*. It was first identified in France in 1934 under the name 'révolution démographique.'¹⁸ The anglicization of the name came a decade later.

The term 'demographic transition' has come to be more than mere description. Implicitly it is a theory about the way human populations automatically adjust to improved circumstances. It is assumed that the transition will eventually be complete (low fertility = low mortality) and stable, even though there has not been time to validate the latter point. It is also assumed that the forces that keep fertility low will (providentially!) not be painful to contemplate or experience. The fact that pain was not emphasized in the transition experience in European history is no doubt a consequence of two

factors: the slowness of the transition (it took place over some two or three centuries); and the fact that most histories were written by the comfortable people who suffered the least from the transition. It was easy for demographers immersed in a European culture to assume that European history was the model for the history of all cultures, sooner or later. The demographic transition was seen as a historical imperative. Such a gratuitous assumption has been condemned by the philosopher Karl Popper as *historicism*.¹⁹ The demographic transition theory is a *post hoc* fallacy universalized and projected into the future.

If the world has limits — which is the only reasonable assumption — terrestrial population growth must eventually come to an end as the aggregate fertility rate once more becomes equal to the aggregate mortality rate. For both to be high, or both low, would equally well bring the transition to a close, but transitionists assume that both will be low: that is the reason for calling the theory they support the *Benign Demographic Transition Theory*. As used in argumentation the theory implied that making people rich and comfortable would remove the threat of overpopulation.

By 1969 a widely used population textbook called transition theory 'one of the best documented generalizations in the social sciences.'²⁰ Only a few years later the demographer Michael Teitelbaum expressed serious doubts: 'its explanatory power has come into increasing scientific doubt at the very time that it is achieving its greatest acceptance by nonscientists.'²¹ In 1985 Teitelbaum and Winter spelled out a more forceful criticism: 'It is doubtful whether this theory was ever truly a theory at all (i.e., a set of hypotheses with predictive force) ...'²²

The literature undercutting the Benign Demographic Transition theory grows ever larger. Etienne van de Walle concludes that 'central Africa is one vast contradiction of the theory: mortality has fallen, and fertility has risen, for two generations, with no end in sight.'²³ Ester Boserup predicts that 'Population increase will be rapid in Africa for many decades ...'²⁴ Demographers and other professional students of population have learned their lesson, but still the Benign Demographic Transition theory guides the work of those engaged in professional *telephilanthropy* — philanthropy targeted on people who are distant in space or ethnic characteristics.

There are two reasons for the continued fashionability of the Benign Demographic Transition theory. First, it is a providential theory and hence eminently acceptable. Second, it justifies the jobs of those who are employed by telephilanthropic foundations. The persistence of hunger and poverty in distant lands after millions of dollars have been poured into them discourages domestic donors; an optimistic reference to the Benign Demographic transition can often quiet doubts and loosen purse-strings.

As transition theory declined in prestige there developed a realization that perhaps the basic theory of human population dynamics was not providential after all. Perhaps the details of human behavior needed to be studied more carefully? Fortunately the basis of this study was laid early in the nineteenth century, though it was noticed by virtually no one, probably because the resultant 'theory of the commons' is the very opposite of a providential theory.

The Tragedy of the Commons

The Reverend Thomas Robert Malthus sought an explanation of his dismal theorem in the comparison of his two ratios (one of which we no longer defend). A better approach was taken by another man of the cloth in 1833, the year before Malthus died. This man was the Oxford mathematician and economist William Forster Lloyd. He showed how the properties of a distribution system, interacting with human nature, can produce unwanted effects.

In a manner that would develop into a habit in science a century later, Lloyd began by setting up a 'model':

Why are the cattle on a common so puny and stunted? Why is the common itself so bare-worn, and cropped so differently from the adjoining inclosures? . . . The difference depends on the difference of the way in which an increase of stock in the two cases affects the circumstances of the author of the increase. If a person puts more cattle into his own field, the amount of the subsistence which they consume is all deducted from that which was at the command, of his original stock; and if, before, there was no more than a sufficiency of pasture, he reaps no benefit from the additional cattle, what is gained in one way being lost in another. But if he puts more cattle on a common, the food which they consume forms a deduction which is shared between all the cattle, as well that of others as

his own, in proportion to their number, and only a small part of it is taken from his own cattle.²⁵

A careful reading shows that Lloyd had a clear conception of *carrying capacity* and the unfortunate consequences of exceeding it.²⁶ Short-run self-interest drives a herdsman in a common to add animals to his herd beyond the carrying capacity of the domain because the profit from so doing accrues to him alone, while the attendant costs caused by overpopulation are commonized over the entire community of herdsman.

In a common pasture that is managed by no powers other than those of herdsman acting individually, the exploiters are caught in a 'Double C — Double P Game' (CC—PP Game): *Commonize the Costs while Privatizing the Profits*.²⁷ Unhappily, in the long run all the herdsman lose in an unmanaged common; but — so long as they cling to this system — they cannot escape ruin. Ruin that is both foreseen *and* inevitable is the very essence of Greek tragedy: recall, if you will, *Oedipus Rex*.

The idea of the tragedy of the commons has ancient but modest roots. Antiquarians like to quote Aristotle: 'That which is common to the greatest number has the least care bestowed upon it. Everyone thinks chiefly of his own, hardly at all of the common interest.'²⁸ Aristotle's statement is undoubtedly a precursor of the theory of the commons, but it is not rich enough in meaning to generate the formal theory. The closest Aristotle's aphorism comes to mathematics is a vague hint of less and more. But what Lloyd said, though he used no mathematical symbols, has led to explicit mathematical equations.²⁹

The primary interest of the Oxford economist was not in malnourished cows but in human overpopulation. 'Marriage is a present good,' he said, 'but in a community of goods, where the children are maintained at public tables, or where each family takes according to its necessities out of the common stock, these difficulties [impinging on the parents] are removed from the individual. They spread themselves, and overflow the whole surface of society, and press equally on every part.'³⁰ What Lloyd assumes in this model is a distribution system resembling the one Karl Marx praised 42 years later: 'From each according to his ability, to each according to his needs.'³¹ Marx, ignorant of Lloyd's work, naively promoted his motto as a formula for felicity.

It is puzzling that Lloyd should have so emphasized the dangers of commonizing the costs of child-rearing, for in his day and his community these costs were almost entirely privatized. Since Lloyd's time the commonization of the costs of child-rearing has gone much further and Lloyd's strictures are much more appropriate. Guilt-mongers of our time delight in blaming parents for the overpopulation of a nation: such has been the message of Zero Population Growth, Inc., an American organization operating principally on college campuses. ZPG literature never refers to Lloyd's work. This is a pity, for he pointed out long ago that 'the simple fact of a country being overpopulous ... is not, of itself, sufficient evidence that the fault lies in the people themselves, or a proof of the absence of a prudential disposition. The fault may rest, not with them as individuals, but with *the constitution of the society, of which they form part.*'³²

Not blame but *mechanism* was Lloyd's quarry as he puzzled over the persistence of human suffering. How was his work received in his day? Apparently it had little impact. The reasons were partly personal.³³ He suffered the handicap of being a member of a sickly family. In five years he gave only a very few lectures at Oxford and then, with private means, retired to Prestwood, Great Missenden, where he lived 'in apparent obscurity' until his death from a stroke at age fifty-eight.

In 1953 the United Nations published a large and useful summary of population doctrines and beliefs under the title *The Determinants and Consequences of Population Trends*. Out of a total of 330,000 words only 43 are devoted to Lloyd, and these occur at the end of a long footnote. Worse, in summarizing Lloyd's contribution to the theory of population this scholarly work gets his position 180 degrees wrong. (Since the book is the work of a committee we don't know whom to blame.) It's no wonder that the resurrection of Lloyd's work in 1968 came as a surprise.³⁴

Laissez-Faire and Equality

Production, trade, distribution: what limits to freedom shall we impose on these interrelated functions? The laissez-faire position is that there should be complete freedom for the first two, while the

third must be constrained by the rights of private property. Setting aside the vexed question of property, what about the first two functions? Looking at the world as it is, Walter Lippmann once wrote some revealing words (to which italics have here been added):

The pure doctrine of non-intervention in production and trade has never in fact been practiced anywhere. Even Adam Smith, let alone John Stuart Mill, recognized exceptions to the rule. One could go further, I believe, and argue plausibly that most men have shown in their behaviour that *they wished to impose free capitalism on others and to escape it themselves*. Employers have believed in it for their employees, and have appealed to it against factory laws and unionism. But they have not hesitated to call upon the state for protection against foreign competitors. Manufacturers who had to ship goods have not hesitated much about regulating the railroads . . .

There is no reason to think that business men under capitalism have had any consistent conviction of *laissez-faire*. Their employees have certainly not had it. They have voted for tariffs when they were told their jobs depended upon them. They have voted to close the labor market by restricting immigration. They have voted for labor laws and they have organized unions. Like their employers they have believed in *laissez-faire for others*.³⁵

The paradox can be put in the following terms. However passionately theoreticians may cling to symmetry and reciprocity in elaborating their theories of production and trade, those who are actual practitioners of economic living can be just as passionate in defending asymmetry and non-reciprocity in their daily lives. The merits of the case, as concerns production and trade, will not be argued here: our present task is to take up the distribution function.

The *thrust* of rhetorical pronouncements identified as 'idealistic' is symmetrical and reciprocal. Traditional religions, atheistical egalitarianism, and liberation theology all glorify equality in distribution. But intentions do not necessarily lead to accomplishment. Distributing a community's wealth in the light of Marx's ideal (*From each . . .*) first produces inequality, and then (ultimately) widespread poverty. For two reasons:

First, human abilities are the product of the interaction of innate abilities and training. People are unequal at birth, and education exaggerates their inequality. Consequently productivity varies fantastically from one individual to another.

Second, what should be the grounds for allocating wealth? Idealists tell us that distribution should be according to a person's 'need.' But who determines 'need'? If agents of the state do so, freedom goes out as restraint and resentment come in. Revolution may be just around the corner. On the other hand, when each individual is the sole judge of his own need, the door is opened to greed. Adam Smith spoke of the 'insatiable desires' of the rich, but the desires of the poor can also be difficult to control. Rich or poor, people vary in their susceptibility to satiation. A political decision to satisfy variable 'needs' would end up giving greater rewards to the insatiable. Is that the 'fairness' that idealists seek?

'From each according to his ability, to each according to his needs' defines a highly asymmetrical, non-reciprocal system of distribution. *You* must contribute to the common pot according to *your* ability, while *I* demand the right to take out of the pot according to *my* needs, *as I reckon them*. 'Need creates right,' say I. But with every *I* saying this, in a world of shortages there can be no spontaneously generated stability. (If there were no shortages there would be no problem of course: but that does not describe our world.)

We need to look at the commons from another point of view, namely its relation to responsibility. Unfortunately, most of the statements that include the word 'responsibility' are vacuous rhetoric. Typically, a politician who proclaims his responsibility thereby claims power; he will oppose attempts to make him operationally responsible for his errors. To serve the needs of society, responsibility needs to be defined in the following way: *An agent is fully responsible when he pays all the costs of the benefits he receives.*

Is a distribution by the formula of the commons a responsible distribution? The formula for the system of the commons may be written as CC—PP: *Commonize the Costs against everyone, but Privatize the Profits - to me*. The first term of each dyad represents the actor, which is *C* in the first dyad and *P* in the second. Since the actors are different — *C* versus *P* — commonizing does not meet our operational definition of responsibility.

Irresponsibility opens the door to malfunction and uncontrollable costs. Applications of the theory of the commons extend far beyond common pastures, far beyond overpopulation among human beings. For instance, the theory extends to the capture, by speculators, of

gains in the value of real estate as a result of community development. This diversion of community wealth was vigorously condemned by Henry George. Robert Andelson has explained the deep equivalence of George's ideas and commons theory.³⁶ The theory extends to the dysfunctional multiplication of water projects made possible by the federal commonization called 'subsidies.'³⁷ The theory is applicable to all insurance schemes, which commonize the losses of a few among all those who subscribe to a system; though insurance is a defensible way of dealing with exceptional losses, it inevitably encourages carelessness and dishonesty. The theory of the commons also applies to the many variants of socialized medicine, as Howard Hiatt first made clear.³⁸ In the medical case the waste is due less to the abuse of the commonized system by hypochondriacs than it is to its exploitation by liability lawyers whose forensic creativity pushes physicians into the practice of 'defensive medicine,' that is, the employment of expensive medical procedures that defend doctors against lawyers, producing a waste of resources that defrauds the general public. Like Proteus of the Greek myth, the irresponsible commons take on ever new forms in a society in which all too many people fail to keep in the forefronts of their minds the economists' anti-Providential assertion that 'There's no such thing as a free lunch.'

In the pure case, commonizing leads to ruin. But the modern state operates as a 'mixed economy,' and so ruin is less common than simple waste. Moreover, under conditions of true plenty the unmanaged commons is not only tolerable, it may also be the most economical way of exploiting the environment. When an American frontiersman shot a dozen passenger pigeons for his dinner he harmed no one. Restricting such activities of the pioneers would have been wasteful of human time and effort.

Criticisms of the Commons Theory

After the resurrection and elaboration of Lloyd's theory of the commons several papers were published arguing that even with shortages a commonized resource need not necessarily come to a bad end. Some of the criticisms are just and call for a clarification of the

idea of 'commons.' Arthur F. McEvoy (1987) spoke of 'the commons myth,' maintaining that it:

... misrepresents the way common lands were used in the archetypical case (i.e. England before the privatization of landed property). English farmers met twice a year at manor court to plan production for the coming months. On those occasions they certainly would have exchanged information about the state of their lands and sanctioned those who took more than their fair share from the common pool. Likewise, Italian, Chinese, and other immigrant fishing communities in late nineteenth-century California kept very tight control over the allocation and harvest of their resources so as to produce what we would now call an optimum yield for their group. As the *San Francisco Chronicle* put it in 1907, 'if any Italian thinks it is possible to catch crabs for the market without joining the association, let him try it.'³⁹

McEvoy's criticism has merit, but the merit must be evaluated in the light of a remark made by the philosopher Alfred North Whitehead: 'All propositions are erroneous unless they are construed in reference to a background which we experience without any conscious analysis.'⁴⁰ Clearly, the background of the resources discussed by Lloyd (and later by myself) was one of *non-management* of the commons under conditions of scarcity. In contrast, the English farmers and Italian fishermen cited by McEvoy were *managing* access to the resources they were exploiting. The title of my 1968 paper should have been 'The Tragedy of the *Unmanaged* Commons.' The commons discussed by McEvoy were managed by forces that are variously called 'community pressure' or 'shame.' When pressures are given the legislated form of laws the result is sometimes called 'socialism.'

By long tradition, the open ocean — far beyond the reach of national sovereignties — is an unmanaged common. That is why the stocks of most oceanic fisheries are now accelerating toward exhaustion. Oceanic fisheries haven't a chance of survival so long as their exploitation is guided by the rubric, 'freedom of the seas' (*read*, 'laissez-faire' once more). An apparent exception is the Alaska fur-seal resource which has prospered for nearly a century, but that is because the commons of its breeding grounds in the Pribilof Islands are in fact managed jointly by only two exploiters, Russia and the United States.

A more serious case is that of air pollution which is out of control

because the absorptive capacities of the atmosphere are treated as unmanaged commons. As people have become concerned with the proven damage of acid rain and the possible disaster of an atmospheric greenhouse, nations have moved closer to converting the global atmosphere from an unmanaged common to a managed one. (The political roadblocks to this reform are, of course, formidable.)

We should speak of the 'commons model,' rather than the 'commons myth.' Both Lloyd and I investigated the logical properties of this model (though this use of the word 'model' did not develop until the twentieth century). Whether any particular case is a materialization of that model is a historical question — and of only secondary importance. What human ecologists are most concerned with are the commons of our time that are truly unmanaged (or poorly managed). After these have been identified the next question is, How can we bring about the successful management of the remaining, deteriorating commons?

In a strict sense, it is not the commons that need managing, but the people who exploit them. Managing people requires a deep knowledge of human nature — but what is the nature of human beings? McEvoy is not satisfied with the answers he infers from the literature. He says that the 'shortcoming of the tragic myth of the commons is its strangely unidimensional picture of *human* nature. The farmers on Hardin's pasture do not seem to talk to one another. As individuals, they are alienated, rational, utility-maximizing automats and little else. The sum total of their social life is the grim, Hobbesian struggle of each against all and all together against the pasture in which they are trapped.' This is a serious misapprehension of the evidence, as can be shown by abandoning the hypothetical model to examine some relevant empirical evidence.

The Hutterites of northwestern North America have adapted their behaviour to the providential motto of Karl Marx. (Whether they even know about Marx is not important.) Each Hutterite gives such labor as he or she feels is reasonable to the community, and takes out of the common stores what he/she feels is needful. Hutterites are admirable and successful farmers, and they have discovered something about human nature and its bearing on the limitations of the commons that should interest everyone. John Baden and Richard Stroup describe the problem:

There is a saying commonly heard among the Hutterites: 'All colonies (especially "other" colonies) have their drones.' Further, it is recognized that the number of 'drones' increases more than proportionately with an increase in colony size. Given that: (1) all goods are public goods, (2) individual economic incentives are minimal, and (3) material differentials are outlawed, a rational, maximizing person would operate to maximize his pleasure, including leisure. Included in such self-seeking activities are trips into town or to a neighboring ranch to 'check on' or 'pick up' something allegedly relevant to his assigned task.⁴¹

Keeping in mind McEvoy's roster of the shortcomings of exploiters of the commons we must judge that the Hutterites are, on the testimony of Baden and Stroup, rational and utility-maximizing. But, to use McEvoy's term, are Hutterites *alienated* from their community? Far from it. Many independent accounts make it crystal clear that the Hutterites lead a richly communal life, far from a 'grim, Hobbesian struggle of each against all.' Though the word 'struggle' seems too violent and too colorful, some sort of competition does seem to be going on. No English word is entirely adequate to describe the low-key jostling of wills in a Hutterite community; the word 'competition' will have to do. The Oxford English Dictionary defines 'compete' as 'to strive after (something) in company or together.' It must be said that 'togetherness' is a specialty of Hutterites: as the community increases in size there's many a competition between 'gold-bricks' or 'goof-offs' to see who can get the cushy assignments on the community's work-roster. No blood-letting, no alienation: just quiet 'jockeying for position,' to use an image from harness-racing.

What is the result of this very human behavior? The Hutterites have learned that they can make the Marxian system of distribution work only within rather narrow limits: from (approximately) 60 to 150 persons in the colony. The lower limit is explained by the economist's favourite 'economies of scale.' The upper limit is explained by 'human nature,' more mysterious but just as undeniable a reality as economies of scale.

What aspect of human nature is involved in the control of a *nominally* unmanaged commons? Words are treacherous, but close observation of well-functioning groups exploiting a common resource — herdsmen, fishermen, Hutterite farmers, or whomever —

leads to the strong feeling that it is old-fashioned *shame* that keeps would-be defectors in line. For this to work the size of the decision-making group must be small, apparently less than 150. Let us call this the *Hutterite Limit*.

The observations needed to test the Hutterite limit have usually escaped recording. Traditional anthropology has not been sufficiently numerate to establish the effects of scale. Nevertheless some confirmations of the Hutterite limit have been recorded,⁴² with no clear-cut disconfirmations. A study of population control in modern China showed the importance of close observation in discerning the effective social arrangements. The first observation indicated a group of two thousand people as the unit of control in Beijing. More careful observation showed that the actual unit within which control was exerted varied between 50 and 150 people.⁴³ Conclusion: the Hutterite limit was observed.

Intuitively, the scale effect makes sense. It is a matter of common observation that the effectiveness of shame depends very much on face-to-face confrontations. It is easy for a small group to impose a feeling of shame on its errant members; in a large group, the feeling doesn't transmit well. It looks as though self-seeking is something of a biological constant, while shame is diluted by numbers. That is why formal, explicit government is more necessary in large groups than small. Idealists who feel repelled by explicit government — and such idealists are numerous in our society — should be advised to work for reductions in the size of the operational groups.

Implicitly referring to groups of trans-Hutterite size, James Madison aptly made the connection between human nature and the necessity of government:

Ambition must be made to counteract ambition. The interest of the man must be connected with the constitutional rights of the place. It may be a reflection on human nature, that such devices should be necessary to control the abuses of Government. But what is Government itself, but the greatest of all reflections on human nature? If men were angels, no Government would be necessary.⁴⁴

Wise as it is, the last sentence cries out for correction: 'If *all* men (and women) were angels, no Government would be necessary.' Observations of unmanaged commons ('no Government') show that when the Hutterite limit is transgressed non-conforming behavior

(which may begin with a minority of one) is infective. The larger the group, the more rapid the infection. Destructive behavior that begins with a minority soon becomes the behavior of the majority.

This makes sense. The non-conformer benefits from his actions in a community in which the majority conform to a self-denying ideal. As such a minority visibly prospers, another factor in human nature enters in: *envy*. One by one, hitherto self-denying conformers, envious of the prosperity of non-conformers, join the ranks of the less-than-angels. Positive feedback sets in. The ideal withers away. The process is sensitive to scale; only by keeping the size of the group small can shame triumph over envy.

That this needs saying is evidence of the power of taboo. In the 1960s the 'Free Speech' movement in Berkeley effectively ended the taboo on many four-letter English words, *but not on the four-letter word 'envy.'* As Helmut Schoeck's scholarly study shows, envy is still one of the most powerfully tabooed words of our society.⁴⁵ Much that should be discussed under the subject of 'envy' is often automatically converted into the uncompromising assertion of 'rights.'

Psychological denial not only lays a taboo on existent words, it can also slow the coinage of new ones that affront ruling attitudes. 'Optimism' was coined in 1737; 'pessimism' came along 57 years later. 'Shortage' was coined in 1868; 'longage' arrived 107 years later. Optimists who believe in Providence are energized by the word 'shortage' to look harder for more resources, which they are sure must be out there, someplace. To admit that there is a 'longage' of people or demands is to give up the belief in a providential plethora of resources. It is no wonder that 'longage' is not yet an accepted part of the popular vocabulary.

The world of terrestrial resources is strictly limited, but not seriously so if we can learn to curb human demands. Given temperate demands, our world is vast —

And has more than enough — for no more than enough.
There is a shortage of nothing, save will and wisdom;
But there is a longage of people.⁴⁶

Every asserted 'shortage' of supply can equally aptly be described as a 'longage' of demand. Those who trumpet 'shortages' are likely to

fight vigorously for 'rights.' (Remember '... to each according to his needs.')

This position bespeaks an admirable egalitarian sentiment, but how does the natural environment fare in such a rhetorical environment? If 'needs' include the need to reproduce at will, the drive toward equality of per capita distribution will finally exhaust the environment. In an unmanaged — or weakly managed — common, 'shortage' implies 'rights' implies *ruin*.

But if we admit that envy is a natural and powerful part of human nature, a part that needs to be curbed, we will speak less often of shortages of supplies and begin to think about longages of people and longages of human desires. When we see longage as the central problem there is a possibility that we may find ways of controlling the proportions of the various populations and the dimensions of their demands, thus making it possible for at least a modicum of the world's environmental riches to be passed on to our grandchildren. The rhetoric we speak reveals the models with which our minds do their work. The rhetoric we live by determines our effects upon the world.

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