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The Birth of the Liberal Society

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Queen's Economics Department Working Paper No. 770

The Birth of the Liberal Society

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THE BIRTH OF THE LIBERAL SOCIETY

DISCUSSION PAPER #770

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Abstract

The liberal society might be supposed to have emerged directly from anarchy, spontaneously or in a social contract; or the liberal society might be supposed to have emerged indirectly by a roundabout process in which anarchy gave way in the first instance to despotism and then despotism gave way to a liberal society. The liberal society, for the purposes of this paper, is a society with an economy based on private property and with a polity based on majority rule voting. Anarchy is a society without law or government in which people divide their time among production, defending what they have produced and taking goods from others. Despotism is a society with a ruling class that exploits the rest of the population as a shepherd exploits a flock of sheep. It makes more sense to suppose that the liberal society evolved by the indirect route through despotism than to suppose that it evolved directly out of anarchy.

The Birth of the Liberal Society - Dan Usher

The liberal society might be supposed to have emerged directly from anarchy, spontaneously or in a social contract; or the liberal society might be supposed to have emerged indirectly by a roundabout process in which anarchy gave way in the first instance to despotism and then despotism gave way to a liberal society. The liberal society, for the purposes of this paper, is a society with an economy based on private property and with a polity based on majority rule voting. Anarchy is a society without law or government in which people divide their time among production, defending what they have produced and taking goods from others. Despotism is a society with a ruling class that exploits the rest of the population as a shepherd exploits a flock of sheep. I argue in this paper that it makes more sense to suppose that the liberal society evolved by the indirect route through despotism than to suppose that it evolved directly out of anarchy.

I attempted to describe the primitive world of anarchy and despotism in "The Dynastic Cycle in the Stationary State" (Usher, 1989). The model of anarchy followed Bush (1972) and Buchanan (1975) and the model of despotism followed Tullock (1974) to some extent. It was claimed that, once established, a despotic society might persist indefinitely or revert periodically to anarchy (in a manner resembling the dynastic cycle in Chinese history) depending on the values of certain technical and behavioural parameters. The analysis suggests an obvious question: If anarchy and despotism were the natural conditions of society in the distant past, what might have happened to break the cycle of anarchy and despotism so as to allow for the evolution of the kinds of societies we know in the West today?

Where did property rights come from? How did we acquire the institution of majority rule voting? By what route did the liberal society emerge?

Whether the passage from anarchy to the liberal society is direct or indirect is in one sense a peculiar question. To learn how Canada evolved, one reads the history of the country, going back, of course, to the origins of its institutions in Europe and the Middle East - a history too complex to be pigeon-holed as either direct or indirect evolution out of anarchy. Our question about the origin of the liberal society cannot be a straightforward question about history. It is, rather, a question posed about an imaginary past but intended to identify the consequences of alternative courses of action today. The logic of the question is similar to the logic of Adam Smith's famous history of the progress of opulence, or of Marx's description of the transition from feudalism to capitalism to socialism, or of the accounts in Hobbes and Locke of the social contract - all highly stylized summaries of the great sweep of history, telling us not what really happened, but what we can or ought to do now. Locke's account of the social contract reinforced the Whig's devotion to individualism and liberty, just as the story of Abraham's sacrifice of Isaac reinforced the Israelites' aversion to the sacrifice of human life.

To ask whether the liberal society evolved directly or indirectly is to contrast two myths about the prospects for reform. To say that the liberal society evolved directly out of anarchy is, on most versions of the story, to say that reform is quick and painless. If we do not like the way society is organized, we can reconstitute the state of nature, hold a constitutional convention, and rebuild society from scratch. To say that the liberal society evolved indirectly from anarchy, with despotism as an intermediate

step, is to say that the evolution of the liberal society has been a slow painful process that nobody would want to repeat. Reform of society so radical as to require a return to anarchy would not create the better society that the reformers genuinely desire. People would be condemned to relive the passage through despotism, with the attendant risk that there may be no exit from despotism next time. One myth is optimistic and the other is pessimistic about the prospects for large-scale social transformation.

To explain the transition from despotism to the liberal society is to postulate a process by which private ownership of the means of production and majority-rule voting might gradually evolve out of a society that is initially despotic. Private ownership is easy, for a ruling class soon discovers that it is more profitable and less troublesome to tax a market economy than to appropriate the surplus from a planned economy. An income-maximizing ruling class has reason to respect private property. Majority-rule voting is more difficult to explain. I attempt to model the development of majority-rule voting with universal, or almost universal, franchise as the final stage of a gradual evolution out of the King's council. The first step is for the leading men of the Kingdom to demand rights from the King, rights that cannot be exercised collectively except by voting. Then franchise is gradually extended as rebellion by the unenfranchised is again and again averted.

The Direct Passage from Anarchy to the Liberal Society

(a) Spontaneous Cooperation

Can spontaneous, self-interested and uncoordinated actions by a large number of people lead to the gradual abandonment of anarchy and the emergence

of a liberal society with voting and property rights? This has been claimed to be possible. The basis of the claim, as I understand it, is the demonstration of how certain simple institutions, might have evolved out of uncoordinated activity of many self-interested agents. The proof that these institutions could evolve spontaneously becomes by analogy the justification for the proposition that more complex institutions may have evolved that way as well. Two examples of the spontaneous evolution of institutions are the choice of a market day, a variant of a problem analysed by Schotter (1981), and the repeated prisoners' dilemma game as analysed by Axelrod (1984). I discuss these examples briefly, primarily to show that they do not provide a ~~basis for the presumption~~ that the liberal society may have evolved spontaneously out of anarchy. Some institutions may evolved spontaneously; many institutions have not, unless the word "spontaneously" is given so extended a meaning as to cover all possible events.

Spontaneous evolution of the choice of a market day is a process by which farmers who would like to be present at the market on the same day of the week, but who cannot communicate with one another, do manage to select a universally-recognized market day. Farmers go to market once a week. Each farmer knows the location of the market and the number of other farmers at the market on the days when he himself is present. He does not know the total number of farmers or the number of other farmers at the market on those days when he is absent. Someone who goes to market on Tuesday, for example, knows how many other farmers are there on Tuesday, but not on any other day. Farmers hone in on one particular day by rational use of their observations of numbers of farmers on various days over a long series of weeks. In the first week of the process when nobody has any idea which day is likely to be

more crowded than any other, each farmer picks a day at random in a lottery where every day has the same weight. Then gradually as the farmer acquires experience, he places more weight on days that are observed to be more crowded. Eventually and purely by accident, one day acquires an edge over the rest. As the weeks go by, more and more farmers are present at the market on that day, until, finally, all farmers appear at the market on that day alone.

Let N be the total number of farmers and define $n(d,t)$ as the number who go to market on day d of week t . A farmer who goes to market on that day observes $n(d,t)$. He does not observe $n(d^*,t)$ where d^* refers to any other day of the week. In the first minute of every week, the farmer i chooses a day at random and he will go to market on that day. He chooses by throwing a weighted seven-sided die where the weights are the probabilities attached to each day of the week. The probability that farmer i goes to market on day d of week t is written as $P^i(d|t)$ where, by definition,

$$P^i(1|t) + P^i(2|t) + \dots + P^i(7|t) = 1 \quad (1)$$

for all i and t . The process begins at week 0. Having no information about how many people to expect at the market each day, farmers set $P^i(d|0) = \frac{1}{7}$ for all d . Thereafter, each farmer gets one piece of information per week. He observes the number of other farmers who appear at the market on the same day as himself. Farmers get different information because they go to the market on different days of the week.

The farmer's problem in updating probabilities in the light of the information he acquires is to avoid a situation where, for instance, one group of farmers goes to the market regularly on Tuesday, another goes regularly on Wednesday, and the advantages of all going on the same day are

lost because neither group knows of the existence of the other. Farmers must adopt an updating procedure in which the sampling of the days of the week does not stop altogether until each farmer is sure that all other farmers are going to market on one particular day.

A satisfactory procedure is to base probabilities on the estimated proportions of the population arriving at the market on each of the seven days of the week. Define $n^i(d,t)$ to be the most recent observation by farmer i at the start of the week t of the number of people who appeared at the market on day d . If t is the fiftieth week, if the last time the farmer i went to the market on a Tuesday was in the fortieth week and if he observed 65 people there, then $n^i(\text{Tuesday}, 50) = 65$. In the event that farmer i has never gone to the market on day \hat{d} , the value of $n^i(\hat{d}, t)$ is set equal to the average of $n^i(d, t)$ for those days d when he has gone to the market. The terms $n^i(d, t)$ are defined for all t except $t = 0$. If farmer i observed 100 people at the market on Wednesday of week 0, 110 people on Tuesday of week 1 and 90 people on Friday of week 2, then $n^i(\text{Tuesday}, 3) = 110$, $n^i(\text{Wednesday}, 3) = 100$, $n^i(\text{Friday}, 3) = 90$ and $n^i(d, 3) = 100$ for all d different from Tuesday, Wednesday and Friday. Define $d^i(t)$ to be the day with the largest value of $n^i(d, t)$. The ratio $n^i(d^i(t), t) / \sum_{d=1}^7 n^i(d, t)$ is the estimate by farmer i of the proportion of farmers going to the market on the most crowded day of the week.

The eventual emergence of a universally-recognized market day is virtually guaranteed when probabilities each week are set as follows: For the day, $d^i(t)$, that is estimated by farmer i to be most crowded, the probability of going to market on that day becomes

$$P^i(d^i(t)|t) = \sqrt{\frac{n^i(d^i(t),t)}{\sum_i n^i(d,t)}} \quad (2)$$

and for all other days d,

$$P^i(d,t) = \frac{1}{6} \left(1 - P^i(d^i(t)|t) \right) \quad (3)$$

The reason for setting $P^i(d^i(t)|t)$ equal to the square root of the estimated proportion of farmers at the market on the most crowded day is to raise $P^i(d^i(t)|t)$ significantly above the probabilities attached to all other days. The reason for setting all other probabilities equal is to avoid giving farmers a zero probability for any day until the $n^i(d,t)$ for all but the most crowded day are equal to zero.

Since each farmer has only one observation at the end of week 0, the probabilities in week 1 must remain at $\frac{1}{6}$ and, the number going to market on each day of the week 1 must be quite similar as long as the total number of farmers, N, is large. In week 1, each farmer gets a second observation and a unique $d^i(2)$ can be identified. The probabilities that farmer i attaches to the days in week 2, though similar, are no longer quite the same. Eventually, quite by chance, one day acquires an edge over the rest. From then on, farmers gradually increase their probabilities of going to market on that day and the probabilities of going to market on any other day becomes closer and closer to zero. The essence of the example is that this eminently satisfactory result does not emerge through central planning or because farmers act in accordance with their conception of the common good. The rules for choosing probabilities each week may be thought of as representing prudent self-interested behaviour on the part of farmers who are always searching for the day with the largest n. A clear example of the spontaneous evaluation of a social institution!

What are we to make of this story? Do we have here a paradigm of the evolution of the liberal society out of anarchy, or do we have an instance of spontaneous evolution embedded in a larger and very different mechanism? I would argue that the latter is almost certainly the case.

The story is not particularly convincing, even as an explanation of the choice of a market day. The Sunday market could have evolved spontaneously, but it could, equally well, be the consequence of an explicit public decision. The King may have decreed that henceforth the market will be held on Sunday. Some prehistoric Paul Revere may have ridden among the farmers shouting, "It's Sunday!". Other institutions that might have emerged spontaneously in the process described above - driving on the right-hand side of the road or use of standardized weights and measures - could equally well have been the outcomes of public decrees.

A more important criticism of the story of the Sunday market as a basis for an explanation of the emergence of the liberal society is that the story lacks essential ingredients of social interaction and abstracts from the real impediments to spontaneous cooperation. The Sunday market example is a particular case of what Ullman-Margalit (1977) has called coordination norms, defined as social conventions emerging from situations representable as games of the form represented in Figure 1.

Figure 1: The Coordination Game

		Player B	
		strategy 1 (left)	strategy 2 (right)
Player A	strategy 1 (left)	2 3	0 0
	strategy 2 (right)	0 0	2 3

Each of two players (the essence of the game is unaffected by the addition of more players) chooses between two (easily generalized to any number, for instance, seven) available strategies. The essence of the game is that neither player cares which strategy is played as long as everybody plays the same strategy, the same day to bring one's goods to market, the same side of the road, the same weights and measures. The players would immediately agree upon a coordinated strategy - either left or right, it makes no difference - if they could communicate. The choosing of a strategy at random and updating one's probabilities on the basis of observed behaviour of other players is a substitute for communication in this game.

The coordination game is not a paradigm for all possible social interactions. Ullman-Margalit contrasts the coordination game with two others, neither so amenable to an ideal, unanimously agreed-upon solution. The first is the prisoners' dilemma game where the outcome when each player does what is best for himself is different from, and worse for everyone, than the outcome when the players cooperate. An example is the following

Figure 2: The Prisoners' Dilemma

		Player B	
		strategy 1 (cooperate)	strategy 2 (defect)
Player A	strategy 1 (cooperate)	5 5	0 6
	strategy 2 (defect)	6 0	1 1

To cooperate in this example is to choose strategy 1. When both players cooperate, they both get incomes of 5. When neither cooperates, they both get incomes of 1. Yet the only equilibrium strategy in the game is for them to defect. Defection is the individually-rational strategy, despite the fact that cooperation is best for everybody. Suppose player B chose to cooperate. Player A would then have an incentive to defect, raising his income from 5 to 6. Player B, whose income is now reduced to 0, would then have an incentive to change his strategy to "defect". As in the coordination game, the two players might agree to cooperate if they could communicate. The games differ in that the agreement in the prisoners' dilemma game needs to be enforced, since each player has an incentive to double-cross the other, while the agreement in the coordination game is self-enforcing. The prisoners' dilemma game looks like a model of anarchy with no escape, no route to any analogue of the liberal society.

The third fundamental game in Ullman-Margalit's classification is the game leading to "norms of partiality". An example is the game in Figure 3.

Figure 3: The Partiality Game

		Player B	
		strategy 1	strategy 2
Player A	strategy 1	2 1	0 0
	strategy 2	0 0	1 2

The essence of this game is that, like the coordination game, both players must choose the same strategy to avoid the "worst" outcome, but there is a direct conflict of interest between the players as to which strategy is chosen. Player A prefers strategy 1. Player B prefers strategy 2. Something outside the game, some appeal to tradition or to violence is required to settle the matter. The game captures an aspect of despotism. Everyone, subject and ruler alike, is better off, let it be assumed, in a despotic society than in anarchy, but nobody willingly becomes the subject rather than the ruler. The significance of the distinction between the cooperation game and the partiality game for the assessment of the prospects of spontaneous cooperation is that the outcome of cooperation, whether spontaneous or otherwise, is not necessarily desirable. Cooperation may be among the few in exploiting the many. Even if entirely spontaneous cooperation may not lead to a liberal society, but may instead lead directly to despotism, as discussed below in connection with the indirect route from anarchy through despotism to the liberal society.

The basic hypothesis in the studies of the emergence of cooperation is nicely expressed by Schotter (1981,4): "Just as Adam Smith's invisible hand

can, in a decentralized fashion, lead economic agents to reach a Pareto optimal competitive equilibrium, it can also lead them to create social institutions when competitive outcomes are not optimal". Against this view I would assert (i) that the implied distinction between centralized and decentralized activity takes no account of limited cooperation exemplified by a predatory government or a gang of bandits, (ii) that there is no justification for the presumption that institutions created by invisible hands are necessarily optimal. They may, like the Sunday market, turn out to be optimal, or they may turn out to be nasty. There is, to my knowledge, no general theorem, comparable to the fundamental theorem of welfare economics, specifying a broad class of conditions under which the interaction of many self-interested agents creates institutions superior to some prior set of institutions. The Sunday market example goes one way; organized banditry goes the other.

The institution-creating invisible hand is sometimes benevolent in circumstances where one might not at first expect benevolence. An interesting instance is Axelrod's repeated prisoners' dilemma contest. Each player's optimum strategy in the prisoners' dilemma game described above is to choose strategy 2, because his reward is higher if he chooses strategy 2 regardless of the choice of the other player. Choosing strategy 2, player A gets \$6 if player B chooses strategy 1 and player A gets \$1 if player B chooses strategy 2. These numbers - 6 and 1 - are both higher than player A's reward - 5 and 0 - if he chooses strategy 1 instead. Both players get \$1 because they both choose strategy 2, though they would have raised their incomes to \$5 by agreeing to choose strategy 1. Variants of this example are often cited to exemplify the proposition that individually rational actions

may be collectively unsatisfactory or that optimal institutions will not emerge as the outcome of self-interested and uncoordinated activity of many people.

Axelrod's example is of an actual contest in which the participants played two hundred consecutive prisoners' dilemma games, rather than just one. The games were played by computers, so that a person "plays" the game by announcing a compound strategy. Compound strategies might be: to choose strategy 2 always, to choose strategy 1 always, to choose strategy 1 as long as one's opponent chooses strategy 1 and to switch permanently to strategy 2 if one's opponent plays strategy 2 at all, and so on. Players had to state their compound strategies once and for all; the computer would then simulate the games according to the announced strategies of the players.

It turned out that the champion strategy was tit-for-tat - begin with strategy 1 and thereafter imitate the last strategy of one's opponent. If he plays 2 today, I play 2 tomorrow; if he plays 1 today, I play 1 tomorrow. A player who chooses the tit-for-tat strategy earns \$5 in each round against another player who also chooses the tit-for-tat strategy. A player who chooses the nastiest of all compound strategies - that is, strategy 2 regardless - earns only \$1 in each round against another player who adopts that strategy, and does only slightly better against a player who adopts the tit-for-tat strategy. The reason why tit-for-tat did well in the tournament was that a player who adopted the tit-for-tat strategy did well enough, absolutely, in contests with players who also adopted tit-for-tat or who adopted other nice strategies, to compensate for his, relatively and absolutely, poor performance in contests with players who adopted nasty strategies.

The moral of the story is that, in social interactions that take the form of repeated prisoners' dilemma games, as opposed to simple once and for all prisoners' dilemma games, one would expect to see strictly self-seeking behaviour in the choice of compound strategies leading to a situation where most people behaved as though they were acting cooperatively (choosing strategy 1 rather than strategy 2) most of the time. The example which had served for years as the paradigm contrast between private and social interest has been turned around. Where once there was a discrepancy between private and social interest, there appears now to be an identity, or a reasonable approximation thereto. Among the examples of behaviour that appears to conform to the repeated prisoners' dilemma are commercial morality of members of minority groups in close and repeated contact, norms of behaviour in tribes or small groups, such as occupants of wagon trains in the Western migration in America in the nineteenth century, norms of behaviour of soldiers in respecting a truce and, perhaps, cooperative behaviour in certain species of animals.

The story of the search for a market day and the story of the repeated prisoners' dilemma game can be thought of as encapsulating different aspects of what we normally call cooperation. In the former, everybody wants to cooperate - to appear at the market on the same day - but does not initially know how to do so. In the latter, everybody knows how to cooperate - to play strategy 1 - but may not want to do so. In general, society is confronted with both problems at once. Normally cooperation implies an organized allocation of tasks and greater productivity for the group as a whole than could be attained if each person worked alone. It is Adam Smith's pin factory. It is "I'll drive the bus, and you'll collect the fares". It

implies communication among agents so that each knows what to do and what to expect of others. Cooperation, in the sense of coordination, normally requires a hierarchy of production and collectively imposed sanctions on those who break the rules upon which such coordination depends.

I am not convinced that the story of the repeated prisoners' dilemma is the essence of the missing theorem about the optimality of self-interested institution-forming behaviour. Like the story of the search for a market day, it seems to account for no more than a narrow range of social interaction under the umbrella of a larger system that operates on very different principles. There are too many fundamental differences between the repeated prisoners' dilemma and the conditions of anarchy for the one to serve as a model of the other.

(i) The repeated play between two given players has no counterpart in anarchy. It is essential to the repeated prisoners' dilemma game that A and B meet over and over again, two hundred times, before A is allowed to confront C, D or E. If, instead, we suppose there to be a large population with a new choice of participants for each play of the game and little prospect of any two participants meeting again for a long time, then each game represents a separate and distinct prisoners' dilemma from which the usual moral can be drawn.

(ii) The near Pareto optimality of the outcome of the repeated prisoners' dilemma is due in large measure to the essential orderliness of the game. The prizes are set. The partners are chosen at random. The number of encounters is established in advance of the play. Nobody runs off with the prize after he has lost a game.

(iii) The emergence of cooperation depends on the assumed rewards of the game. Different and no less realistic sets of rewards could yield very different results. For instance, if winning or losing per se were what mattered, rather than the total score, and if types of people (as distinguished by their strategies) reproduced or failed to reproduce according to whether they win or lose, then the evolutionary stable strategy would be to defect rather than to cooperate. Cooperation would not emerge in that case. Mutual cooperation as the outcome of the universal adoption of the tit-for-tat strategy would also be forestalled if tit-for-tat entailed what Hirshleifer and Coll (1988) refer to as a cost of complexity. In that case a society that consisted initially of some people who always cooperate, some who play tit-for-tat and some who always defect would evolve into a state where only defectors remain, essentially because cooperators do better than tit-for-taters in these conditions and defectors do better than cooperators.

(iv) An equilibrium with some tit-for-taters and some defectors could easily evolve if the return to each strategy depended on the number of people who play it. Suppose, for instance, that the tit-for-tater's return in confrontations with defectors depended on his preparation, and that preparation is costly. The larger the proportion of defectors, the more likely is a tit-for-tater to encounter one, and the greater his optimal preparation will be. What emerges from this process is not universal cooperation, but an equilibrium of cooperation and defection that may be very inefficient and begins to look more like anarchy than like the liberal society.

(v) The repeated prisoners' dilemma can be thought of as a story about crime deterred by punishment. Normally, when we think of crime and punishment, we imagine crimes as committed by individuals and punishment as meted out by the state. In this context, the essence of the repeated prisoners' dilemma game is that the threat of private punishment, as part of the tit-for-tat compound strategy, is sufficient to induce cooperative behaviour, that is, to deter crime. Thus, one way of deciding whether the story is general enough to account for the emergence of the institutions of a liberal society is ask oneself whether the threat of privately-administered retribution is likely to be sufficient without the paraphernalia of the repeated prisoners' dilemma game. If the answer to this question is "yes", then the usual function of the state as law-giver and law-enforcer would seem to be superfluous. If the answer is "no", then the story reduces to the valid, but uninteresting, proposition that it is in each man's interest to obey the law if he would be punished for disobedience. My own answer is unambiguously no. It is the essence of the anarchy model that the privately-optimal response of the victim of non-cooperative behaviour is insufficient to deter all crime. It is of some interest that any model can be designed in which the private response is sufficient. The reported prisoners' dilemma model must be set against other, no less realistic models in which laws have to be enforced by the state.

There is in my opinion an objection more serious than any of these, an objection not to the model per se but to the assertion that it might serve as an explanation of the birth of the liberal society. The objection is that cooperation is far more likely to emerge in small subgroups of the population than in the population as a whole, and that the purpose of such cooperation

may be to exploit the rest of the population. This point, already mentioned in connection with the story of the Sunday market, is no less relevant to the repeated prisoners' dilemma game. Cooperation may be no more than honour among thieves. It may consist of ganging up on helpless victims and in seeing to it that the victims remain helpless by stamping out their attempts at organization. In the repeated prisoners' dilemma game, all conflict is one-against-one. The design of the game eliminates the incentive - which is essential in the evolution of despotism - for A and B to cooperate in subjugating C.

Whatever else it may represent, the model of the emergence of cooperation in the repeated prisoners' dilemma game does not represent the emergence of the liberal society from anarchy. One seeks in vain for an isomorphism between the repeated prisoners' dilemma and some plausible story of the development of property rights and of voting by majority rule. There is, so far, little support for the hypothesis that a liberal society can emerge spontaneously out of anarchy as the unintended consequence of uncoordinated, self-regarding actions by a large number of people.

b) The Social Contract

The theory of the social contract is in a sense the opposite of the theory of spontaneous evolution. It is a theory of how the liberal society may have evolved by design. Expressed baldly and crudely, the theory of the social contract is this: Imagine a state of anarchy, with some lethal violence and much wasted effort as people regularly take what others have produced and try to defend their own goods from predatory neighbours. One day it occurs to somebody that there is a better way for people to live together, that everyone would be happier if property were divided up, police

hired to punish those who refuse to respect property rights, and public decisions taken by majority rule voting. The entire population is called to a meeting. Everyone (or almost everyone) agrees that a liberal society is the best of all possible arrangements. The liberal society is established, and remains in place indefinitely thereafter.

An obvious but, I shall argue, misdirected objection to this story is that it is no more than a story, that most actual states originated in violence, fraud, exploitation and deception by bandits who eventually become the legitimate ruling class, and that those states - such as republican France or the United States - which can trace their origins to a constitutional convention did not emerge out of anarchy but were the successors to other more or less well-organized states. The objection is valid in the sense that there is no evidence of any state having originated in a social contract as described (perhaps I should say satirized) above. The objection is misdirected in that the social contract was never intended as literal history. Obviously governments do not originate in literal social contracts; the lesson in the social contract story is that governments should be respected, obeyed, rebelled against or redesigned "as if" they had originated in social contracts. The social contract is a statement about the nature of government, disguised as a tale about how government began. It is in no pejorative sense a myth, to be judged, like any myth, as good or bad, true or false, valuable or harmful according to the actions it would seem to recommend and not by the strict veracity of its details.

The question before us is whether the story of the social contract provides important insights into the origin of the liberal society and, more importantly, the means by which the liberal society might be preserved and

improved. To deal with this question, we begin with a brief examination of two interpretations of social contract, as a story about loyalty and as a story about justice.

As a story of loyalty, the emphasis is upon the implied promise in the social contract. I am obliged to obey the laws of my country because they are my laws, and because I, in some sense, established them. Socrates¹⁰ appeals to this view of the social contract as justification for his obedience to the law, even to the point of acquiescing to a sentence of death. In *Crito* (1928, 102), Socrates says that "he who has experienced the manner in which we order justice and administer the State, and still remains, has entered into an implied contract that he will do as we command him. And he who disobeys us is, as we maintain, thrice wrong; first, because in disobeying us he is disobeying his parents; secondly, because we are the authors of his education; thirdly, because he has made an agreement with us that he will duly obey our commands..." No one can read the story of the death of Socrates without being moved and without sensing a certain force to Socrates' contractual argument for obedience to the law. There are nevertheless a number of standard objections to the contract in this context.

David Hume (1947, 228) has argued that as a dramatization of our sense of loyalty, the story of the social contract is actually redundant.

What necessity, therefore, is there to found the duty of *allegiance* or obedience to magistrates on that of *fidelity* or a regard to promises, and to suppose, that it is the consent of each individual which subjects him to government, when it appears that both allegiance and fidelity stand precisely on the same foundation, and are both submitted to by mankind, on account of the apparent interests and necessities of human society? We are bound to obey our sovereign, it is said, because we have given a tacit promise to that purpose. But why are we bound to observe our promise? It must here be asserted, that the commerce and intercourse of mankind, which are of such

mighty advantage, can have no security where men pay no regard to their engagements. In like manner, may it be said that men could not live at all in society, at least in a civilized society, without laws, and magistrates, and judges, to prevent the encroachments of the strong upon the weak, of the violent upon the just and equitable. The obligation to allegiance being of like force and authority with the obligation to fidelity, we gain nothing by resolving the one into the other. The general interests or necessities of society are sufficient to establish both.

As a story of loyalty, the social contract is also open to the objection that the supposed object of the citizen's loyalty is dangerously ill-specified. A conservative interpretation of the story would attach the contract to society as it is today. Obedience to the king, subservience to the law, however cruel and unjust, and acceptance of the allocation of income and privilege are all mandated by my implied promise at the moment when society was established. Never mind that society has been changing from the beginning of time; today it is complete, and one must accept it as is. A reformist interpretation of the myth would specify the social contract as an ongoing process and would thereby condemn any deviation from the ideal of what people would agree upon if the contract were to be signed today. Between these extremes, there is room to justify both sides of almost any political argument. The powerful emotional appeal of the story of the social contract as a myth of loyalty is therefore not sufficient to persuade anybody that his political views are unsound, with the possible exception that the story might be employed inculcate a sense among citizens that it is one's duty to engage oneself in one's community.

A slight change emphasis turns the story from a justification to a critique of the institutions of society. In this context, the story becomes a rebuttal to the argument that the existing government must not be altered.

because a decree from on high that takes precedence over the mere desires of the citizens at any given time. You must not alter the government, so it is said, because the monarch rules by divine right or, to cite the modern equivalent, because the present government is the vanguard of the proletariat whose will is historically destined to prevail. No, say the contractarians. God does not arbitrarily specify a right form of government independently of the interests of the governed. Nor does "the" proletariat communicate its will to a select few who happen at the moment to hold the reigns of government. The Will of the People is the will of the people, or it is nothing at all.

If fault can be found with this version of the contract, it is that the story highlights the objectives in the design of society and government as distinct from the constraints, creating the impression that, if people want government to do thus-and-such, they can recreate the state of nature, hold a new constitutional convention and establish a government in conformity to their desires. If you want everybody to have equal incomes or, alternatively, if you want a society with strong barriers to the redistribution of income by the state, and if others agree, it is entirely within your power to institute a government to achieve your aims. That is often true, but subject to the major qualification that reforms sometimes come in packages. For instance, substantially greater equality of income might only be attainable at the expense of enlarging the powers of the bureaucracy, thereby creating a new inequality based on position in the hierarchy rather than wealth. Or too much respect for property rights might convert those without property into enemies of the state. Citizens might want A without B, but their wants may be denied, not by willful opponents,

but by the technology of social interaction. The story of the social contract tends to hide the very basic proposition in social science that actions often have consequences quite apart from the genuine intentions of the actors.

The matter is complicated by the fact that, as discussed in Gough's (1936) history of the subject, there can be two distinct types of social contracts: the contract of society and the contract of government. The first is an arrangement among people regarding law, property, and possibly other matters. The second is an arrangement between citizens and government in which rights and obligations of each are specified; government protects property, punishes criminals, but must not itself violate the law, etc. Locke and, to a greater extent, Nozick look upon the contract of society as inviolate, and thereby deduce that nothing more than a minimal state can be justified. A book (Nozick's Anarchy, State and Utopia) beginning with the assertion "Individuals have rights, and there are things no person or group may do to them (without violating their rights)", can hardly be expected to arrive at any other conclusion. Hobbes (1651) easily avoided that conclusion by refusing to differentiate between two contracts; when people meet in a state of nature to draw up a social contract, they must design society and government together, for no private rights can exist without a magistrate to enforce them. Hobbes' contract was an agreement among subjects to obey the sovereign who, not being himself a party to the agreement, was unbound by it and therefore free to violate the law if reasons of state compelled him to do so. A major premise of the argument was, in my opinion, technical. Hobbes' sovereign had to be absolute because the absolute sovereign was the only viable alternative to the horrors of the state of nature, a proposition which

is hardly self-evident today but may have seemed so to many Englishmen in the year 1651.

The social contract as a story of justice is exemplified by Rawls' appeal to the contract in A Theory of Justice. Rawls' purpose is to conscript self-interest to the task of identifying just laws or the just course of action in any particular case. To Rawls, the rules of justice are what we - in our own self-interest - would adopt behind the veil of ignorance, that is, if we could design the rules for a society we are destined to enter with an equal chance of occupying the circumstances of each and every person in that society. Rawls claims that his fiction captures what most people mean by justice, but he sees no higher test of the veracity of his claim than the reader's own judgement about what he, the reader, means when he uses the word "just". Either what I consider just is what I would agree to behind the veil (in which case Rawls is right), or it is not (in which case Rawls is wrong).

As a description of our sense of justice, Rawls' story of choice behind the veil of ignorance has the particular virtue that it grounds justice in technology as well as in taste. The principles of justice may in some sense be timeless but the context of justice is specific to the society in question. A person with an equal chance of occupying the social and economic status of each and every member of society would choose a very different set of laws, rules and customs when confronted with the technology of the Middle Ages than he would choose when confronted with the technology today. Absolute monarchy is just, in Rawls sense of the term, in a society where democracy is a recipe for chaos. The abandonment of aged and infirm parents is just in a nomadic society, such as that of the Eskimos, where no other

course of action is consistent with the preservation of the lives of the rest of the people in the community. Whipping is just in a society that cannot establish prisons. I suspect that Hobbes would have no difficulty in reconciling his case for an absolute sovereign with Rawls' theory of justice. Where the only alternative is anarchy, as Hobbes assumed, men ought in their own interest, to establish and to subordinate themselves to the Leviathan.

One's sense of justice may also depend to a great extent on one's knowledge of and presumptions about social science. The optimist favours a loose reign of government for a citizenry that is expected to behave decently most of the time. The pessimist favours a tight reign on people who can be expected to behave miserably unless terrorized into order by rack and the dungeon. Both can adopt Rawls' theory of justice wholeheartedly.

The weakness of the social contract as a construction for explaining the birth of the liberal society is the mirror image of its virtues as a myth of loyalty or of justice. Almost by definition, the outcome of a social contract must be socially useful, advantageous, just and worthy of loyalty. Our task is to explain the emergence of the liberal society from anarchy by the play of individual self-interest in circumstances where there may be no institution-creating invisible hand to insure that the result is socially optimal. Anarchy as we have described it is a dreadful condition of society, and the first "civilization" to evolve from anarchy, while perhaps better than anarchy, may still be well short of what, even in the technology of the time, we would now be inclined to call just.¹ If justice means anything at all, it involves the possibility of a discrepancy between what is and what should be. Absolute monarchy may be seen as inevitable, even from a vantage point behind a veil of ignorance, but the monarch's laws and actions can

still be assessed as just or otherwise. Whipping may be seen as just punishment, even by one who bears some risk of being whipped himself, but it must remain possible to assert that excessive or capricious use of the whip is unjust. To say that anarchy gives birth to a liberal society in a social contract is, from our point of view, to envision a passage from darkness to light in one fell swoop with no technologically unnecessary nastiness in between. That, of course, is precisely the point at issue. Our object is to determine whether the liberal society might be created all at once - and by extension open to radical reform with little risk of backsliding to anarchy or despotism - or is the end product of a long nasty process that nobody would care to live through again. To postulate a social contract is to define the problem away.

What then can we say of the social contract as an encapsulated history of the emergence of the liberal society out of a prior state of anarchy? Think of people in a state of nature, dividing their time among growing crops, defending their crops, and attempting to appropriate crops grown by others. One day they all decide to change their ways, to replace anarchy with, let us say, a liberal society. Is this a plausible story? There are several reasons for supposing that it is not, several major inconsistencies in the plot. Who calls the meeting, and how does he communicate with the entire population? Why do people bother to attend; for they will, presumably, acquire the benefits of the improved society regardless of whether they attend or not? How is the meeting conducted? Who chooses the agenda? Do decisions have to be unanimous? If so, any single person can hold out until the community grants him more than his share of property. If not, then some people did not agree to the contract unless they have already

agreed to abide by the will of the majority. How is the distribution of property determined? Who maintains order during the meeting, to ensure that nobody intimidates his fellow citizens?

This last question is of particular importance from our point of view. By the time people learn to cooperate on a large enough scale for a constitutional convention, they have probably known for some time how to cooperate on a smaller scale, as in a gang of bandits or army of condottiere. There must already have formed embryonic despotisms with ruling classes that do better by organized plunder than they would expect to do as obedient and law-abiding citizens once the social contract has been established. Would such people stand idly by and allow the contract to take place? This question is different in form than the other questions we have posed about the contract story. Those questions concerned the willingness and ability of people who had only recently been at one another's throats to cooperate to mutual advantage. This question concerns a group of active opponents of the contract, whose welfare is diminished by the contract and who would seem to have the means to prevent it. In short, is not the story about the evolution of anarchy into despotism more plausible than the story of the abrupt replacement of anarchy by a liberal society?

In the words of David Hume: (Hume, 1947, 228)

Almost all the governments which exist at present, or of which there remains any record in story have been founded originally, either on usurpation or conquest, or both, without any pretense of a fair consent or voluntary subjection of the people. When an artful and bold man is placed at the head of an army or faction, it is often easy for him, by employing, sometimes violence, sometimes false pretenses, to establish his dominion over a people a hundred times more numerous than his partisans. He allows no such open communication, that his enemies can know, with certainty, their number or force. He gives them no leisure to assemble together in a body to oppose him.

Even all those who are the instruments of his usurpation may wish his fall; but their ignorance of each other's intention keeps them in awe, and is the sole cause of his security. By such arts as these many governments have been established; and this is all the *original contract* which they have to boast of.

The face of the earth is continually changing, by the increase of small kingdoms into great empires, by the dissolution of great empires into smaller kingdoms, by the planting of colonies, by the migration of tribes. Is there any thing discoverable in all these events but force and violence? Where is the mutual agreement or voluntary association so much talked of?

As a myth of the origin of government, the theory of the social contract is worse than wrong. It is misleading. It misleads by conveying the impression that the ascent out of anarchy has been painless, and that we could, if we chose, reconstruct anarchy for the purpose of establishing a new and better contract. That is false. Reform, if it is to be effected at all, must be forged out of the materials at hand today.

There is an additional problem. Except where people are absolutely equal in every respect, a society at any time can be seen as a set of social and economic slots into which people must be placed, and an actual allocation of people to slots. Behind the veil of ignorance, there may be complete agreement about the institutions, or slots, on the understanding that these will be filled at random. There can never be agreement as to who will fill each slot. That can only be determined as the outcome of a historical, in the sense of time-taking, process. We may, within limits, be loyal to our society as it has evolved and be content to live with the present allocation of people to slots (or the present distribution of property and advantage) in the belief that the alternative is chaos. We can certainly effect change at the margin. We cannot reopen the entire social contract without at the same time reconstructing the allocation of people to slots. Society is a

going-concern that cannot be dismantled and reconstructed as we please.

To speak as some authors do, of returning temporarily to a state of nature is to imagine an impossible or unacceptably costly voyage. Our description of the formation of the social contract was of a reasonably friendly process in which people who had hitherto been murdering one another quietly sit down together to design a state. If the picture is more or less accurate, we might suppose that the temporary return to the state of nature would be tolerable, perhaps even exhilarating. But if the picture is inaccurate as encapsulated history - as I have argued that it is - if the evolution of society as we know it was slow, brutal and terrifying - not something anybody would consent to relive - then return to the state of nature is out of the question as an aspect of reform.

The Indirect Route from Anarchy through Despotism to the Liberal Society

Of the two stages on this route, the first is the easier to model, for the despotic society would seem to be the natural termination of a process that begins as small groups of people combine to increase their capacity to defend themselves and to exploit others. The second stage is more problematic, for rulers in a despotic society might be expected to have the means to protect themselves from the loss of income and privilege that a transition to a liberal society would necessarily entail. I envision a process of disintegration from the top down, a process not all that different from what we are taught in high school about the gradual emergence of democracy in Modern Times. The reader should be warned, however, that the "models" to follow are more like suggestions as to how events may have occurred than like fully-articulated dynamic models with all the assumptions

specified in detail and every outcome grounded in the assumptions alone. The most I can hope for is that the models seem plausible as far as they go.

a) From Anarchy to Despotism

An essential characteristic of the anarchic society as defined in the "Dynastic Cycle and the Stationary State" is the complete absence of cooperation. Farmers farm alone. Bandits steal alone. Allow for cooperation such as would almost certainly develop once people acquire the power of speech, and immediately the bandits begin to organize to take advantage of the economies of scale in fighting. The military premise of the analysis is that men who are organized in a hierarchy with a reasonably competent leader constitute a more effective fighting machine than men who are not so organized. Once established, the hierarchy is frequently, though not invariably, respected because disobedience reduces the effectiveness of the organization, placing it at a disadvantage in conflicts with other similar gangs of bandits. Rivalry among gangs of bandits is, in the first instance, over the exploitation of the farmers. The ultimate rivalry is for the occupancy of the ruling class. A more realistic model than the one I am about to construct would include a geographical dimension and would allow for the possibility of a balance of terror between rival gangs in adjacent territories, separated perhaps by a natural barrier such as a river or mountain range. Since this model abstracts from geography, the coalescence of small gangs into larger ones does not stop until the entire country is subjugated by a single unified ruling class. Gangs of bandits compete, fighting, destroying and absorbing one another in the effort to monopolize the exploitation of as large a population as possible. The gangs coalesce, until eventually there is only one large gang, and its leader becomes a king.

The gradual consolidation of society into a single hierarchy can be modelled as the outcome of a sequence of confrontations between groups, each organized as a strict hierarchy.

The purposes of the model are i) to show that it is plausible for cooperation among bandits to begin on a small scale and to develop gradually until there is unified ruling class and ii) to tell a simple story about the origin of hierarchy explaining, not so much why people obey once they are slotted into the hierarchy, but how the hierarchy is established in the first place, why A is expected to obey B and not the other way round. In this context, it is convenient to assume that the hierarchy is a complete ordering of all of the members of the gang rather than a set of ranks with many occupants in each rank.

Start with anarchy where each group contains just one member.

Periodically, a pair of groups is chosen at random to be combined, with or without a battle. The larger group challenges the smaller to a fight and the smaller must accept the challenge or submit. [Assume that equal-sized groups must fight.] To submit is to dissolve one's group and to accept the lowest ranks in the new, combined group. For example, if a group of two people submits to a group of five people, the former group is dissolved and the latter expands to seven, of which the last two are the ex-members of the former group.

The technology of battle can be represented for our purposes as a function representing one side's probability of winning as a function of its size and of the size of the opposing group, together with a specification of the probabilities of loss of life on both sides. Define $\phi(n_1, n_2)$ as the probability that a group of size n_1 defeats a group of size n_2 . By

definition, $\phi(n_1, n_2) + \phi(n_2, n_1) = 1$, $\phi(n_1, n_2) > 1/2$ whenever $n_1 > n_2$ (signifying that the larger group has a better than even chance of winning), $\phi(n+x, m) > \phi(n, m)$ and $\phi(n, m+x) < \phi(n, m)$ for any positive x (signifying that an increase in the size of a group must increase its chances of winning).

Fighting is dangerous, though less so for the victor than for the vanquished.

The probability of losing one's life in fighting depends on whether or not one finds oneself on the winning side. Specifically, let V_w be the survival probability of someone on the winning side, and let V_l be the survival probability of someone on the losing side. It is reasonable to suppose that $V_w > V_l$.

In this context, a person's utility is assumed to depend on the size, n , of the group of which he is a member and on his rank, i , within the group. A person's utility is

$$U = U(\text{rank, size of group}) = U(i, n) \quad (4)$$

where n is the size of his group, i is one's rank within it and i is necessarily less than or equal to n . If one is the leader, then $i = 1$; if one is second in command, then $i = 2$, and so on. The dependence of utility on rank has the properties

$$U(i, n) > U(i+1, n) \quad (5)$$

$$\text{and } U(i, n+1) > U(i, n) \quad (6)$$

In a group of size n , a person's utility increases with his rank in the hierarchy. Also, it is preferable to hold a given rank in a large group than in a small one. The function $U(i, n)$ is intended to represent all of the advantages and all of the risks of the person who occupies the i rank of a group of size n . Ideally, the value of U should take account of the number and size distribution of rival bands, but I have made no attempt to allow for

this consideration. The utility function should be thought of as consistent with the assumptions that a person whose utility would otherwise be \bar{U} experiences a reduction in utility to $V\bar{U}$ when confronted with a once-and-for-all risk to his life of $1-V$.

When a group of two members submits to a group of five members, everybody in the original five-member group becomes better off, for it is preferable to be the i member of a seven member group than to be the i member of a five member group. The utility of the leader of the five-member group is $U(1,5)$. His utility increases to $U(1,7)$ when his group acquires two more members. At the same time, the utility of the former leader of the two member group decreases from $U(1,2)$ to $U(6,7)$. If the groups fight for supremacy and if fighting entailed no loss of life, the expected utility of the leader of the five-member group would be $\phi(5,2)U(1,7) + \phi(2,5)U(3,7)$ and the expected utility of the leader of the two-member group would be $\phi(2,5)U(1,7) + \phi(5,2)U(6,7)$. If fighting entails the loss of one

randomly-chosen person on each side (so that the risk to each person in the smaller group is much larger than the risk to each person in the larger group), the expected utility of the leader of the five-member group becomes

$$(4/5)[\phi(5,2)U(1,5) + \phi(2,5)U(5,5)]$$

and the expected utility of the leader of the two-member group becomes

$$(1/2)[\phi(2,5)U(1,5) + \phi(5,2)U(5,5)]$$

where the numbers $4/5$ and $1/2$ are survival probabilities, and $\phi(5,2)$ is considerably larger than $\phi(2,5)$.

Suppose that the larger group is always prepared to fight rather than to submit and that the choice of whether to fight or submit devolves to the leader of the smaller group. The leader of the two-member group chooses to

submit rather than to fight if

$$U(6,7) > 1/2[\Phi(2,5)U(1,5) + \Phi(5,2)U(5,5)] \quad (7)$$

He submits unless the small chance of becoming the leader of a five-member group outweighs the risk of combat.

More generally, imagine a confrontation between a small group of n_1 members and a large group of n_2 members ($n_1 < n_2$), where V_w and V_l are survival probabilities of winner and loser in the event of a fight, and where circumstances compel the leader of the smaller group (n_1 members) to choose between fighting and submission. If he chooses to submit, his utility becomes $U(n_2 + 1, n_1 + n_2)$. If he chooses to fight, his utility becomes

$$\Phi(n_1, n_2)V_w U(1, n_1V_w + n_2V_l) + \Phi(n_2, n_1)V_l U(n_2V_w + 1, n_2V_w + n_1V_l)$$

The expression requires some explanation. The total number of survivors of a fight is $n_1V_w + n_2V_l$ if the first (smaller) group wins, and it is $n_1V_l + n_2V_w$ if the second group wins. Thus the expected utility of the leader of the first group is the sum of a) his expected utility if his group wins, $V_w U(1, n_1V_w + n_2V_l)$, weighted by the probability of the event, $\Phi(n_1, n_2)$, and b) his expected utility if his group loses, $V_l U(n_2V_w + 1, n_2V_w + n_1V_l)$, weighted by the probability of that event, $\Phi(n_2, n_1)$, where, of course, the probabilities sum to 1 because winning and losing are mutually exclusive events. The leader of the smaller group chooses his utility-maximizing course of action and the two groups are combined, either by submission of the smaller group or as the outcome of a battle. In either case, the number of independent groups in society is reduced by one at each encounter until, eventually, only one large hierarchy remains.

The reader need hardly be reminded how much of the reality of warring states is being ignored. To win a battle in this model is to acquire one's

opponent's soldiers, not his land, and having acquired a larger army one is in a better position to confront the next opponent that comes along. As there is no land, it is not possible to explain why the total income of the group depends upon the size of the group, though the distribution of income among the members may be thought of as representing a balance of force in a despotic equilibrium.² There is no distinction in the model between a battle and a war. A side cannot lose some of its territory or some of its men, and keep going. The only possibilities are total victory or total defeat. Nor are there alliances between groups. Group A and group B fearing the greater strength of group C cannot combine to defeat C and divide up its men and resources.

The influence of fortuitous events that sometimes give the edge to one side in a conflict could have been introduced by setting the probability of a group of size n_1 defeating a group of size n_2 to be $\Phi(n_1, n_2) + \epsilon$ rather than just $\Phi(n_1, n_2)$, where ϵ is a random variable with mean zero and is announced to both parties when the smaller group is still deciding whether to fight or submit. With this assumption, we could have allowed some confrontations to end as a stand-off with neither side willing to fight, for all parties would know that they will eventually be placed in a situation where ϵ sufficiently unfavourable that their opponents insist upon fighting.

This model of the evolution of despotism leaves no residue of bandits once the evolution is complete, but a permanent place could have been found for a residue of banditry by supposing that the probability of an encounter between any two groups increases with the size of both groups. The probability of an encounter between the ruling hierarchy and a bandit could then be made small enough not to deter banditry altogether. The hierarchy

would encompass the entire population except for a fringe of outlaws whose survival probabilities are reduced by the activity of the rulers, but not sufficiently to convert outlaws into obedient subjects.

One aspect of the reality of warring states is accounted for reasonably well. The passage from anarchy to despotism is not pleasant. Submission of one group to another need not be a Pareto inferior move, for the loss to those who submit is balanced by the gain to the dominant group. Combat is always Pareto inferior, for everyone would be better off if the victor could be predicted in advance so that the vanquished would have the incentive to avoid combat by submitting at once.³ Subjects are better off in a well-established despotism than during a "time of troubles" when several would-be despots are competing for the prize.

(b) From Despotism to the Liberal Society: To "explain" the transformation of despotism into the liberal society is to present a plausible, common-sense account of how a society governed by a narrow, self-interested ruling class may evolve into a society with private ownership of the means of production and majority-rule voting for collective decision-making - to show how the transition might have occurred as the consequence of interactions among self-interested people or groups, regardless of whether events actually unfolded in that way. Property and voting will be discussed in turn.

Property is easier to explain than majority-rule voting because private ownership of the means of production is not inconsistent with the existence of a cohesive ruling class. Consider a despotic society with a stable population and a well-entrenched ruling class that need have no fear of civil war, coup d'etat within its own ranks or a return to anarchy. How, exactly, do rulers acquire revenue? There would seem to be three main possibilities.

The entire country can be administered by the rulers as one great collective farm. Office-holders with civil or military responsibilities may be compensated with entitlements to exploit particular pieces of property, entitlements that may or may not include rights over groups of people attached to the land. Or rulers may be paid from the proceeds of taxation upon subjects who own property which they are free to employ as they please. In short, communism, feudalism or military dictatorship.

The first of these methods is particularly advantageous when the ruling class is insecure, for it combines revenue collection with surveillance. A ruling class that administers the economy, the army and the police must be quite large and, therefore, relatively defensible against rebellion by subjects. Disrespectful behaviour by subjects is easily identified and expeditiously punished when subjects owe their livelihoods directly to the state. The disadvantage of this method is that the rulers' income per head may be quite low by comparison with what it could be if the economy were organized differently. There is little prospect for productivity growth or for the development of new products when fear of punishment is the subject's only inducement to produce. Rulers themselves lack the incentive to innovate or to administer their bits of the economy well, for the surplus from an enterprise is shared among the entire ruling class. This method of generating income for the ruling class also requires a better system of communication among the parts of the economy than has been feasible except in modern times.

The second method is a cross between collective administration of the economy by the ruling class and full private ownership of the means of production. Property is divided up among members of the ruling class, but

ownership is conditional upon the discharge of certain well-defined duties to the state - administration of the law within one's domain, recruitment and financing of soldiers in time of war, etc. This method may have worked reasonably well in predominantly agricultural economies where there need not be a great deal of communication and coordination among different enterprises. It is not an efficient way to run a modern economy. Even in Feudal times, some branches of the economy, notably foreign trade and commerce in cities, were left to the market.

The great advantage of the third method is that it mobilizes the immediate pecuniary interest of the subject in maximizing the national income while, at the same time, limiting the number of rulers among whom the surplus must be shared. In a society where predation by the ruling class is the only activity of the public sector, the revenue per head of the ruling class, R , is the product of the national income, Q , and the rulers' share, t , (where t can be thought of as the tax rate), divided by the number of rulers, n_R ; $R = tQ/n_R$. Rulers in these circumstances have as much interest in augmenting Q as in augmenting t , and rulers are correspondingly better off in an economy with private property where n_R is small than in an economy that is entirely administered by the ruling class. Rulers have an incentive to foster and protect private ownership of the means of production by their subjects. They do so because private ownership in a free market generates a large national income for rulers to tax. Of course, taxation itself is a disincentive to enterprise; national income is a decreasing function of the tax rate ($Q = Q(t)$ and $Q' < 0$) and there is, from the point of view of the rulers, an optimal, revenue-maximizing tax rate. The case for relying upon taxation rather than upon some other means of exploiting one's subjects is

particularly strong in poor countries where subjects must absorb much of the national income merely to maintain their strength as workers, and small percentage increases in the national income translate into large percentage increases in the take of the ruling class.

The danger to the rulers in a system of private property is that the same independence and flexibility which enables subjects to generate a large national income may also generate centers of opposition to the ruling class. Thus, one would expect to see subjects participating in a free market with private property in societies where, for one reason or another, the ruling class is secure or, as in many countries today, where there has evolved a tradition of civility in which deposed rulers are dealt with gently, by exile for example, rather than by execution at the hands of their successors.

Rulers need not hold property and may rely for their incomes upon the proceeds of taxation. More likely, rulers would join subjects as property holders, especially since their influence as rulers may be directed to augmenting the return from the property they hold. Rulers will turn out to own land in areas where public construction is to take place or to own shares in firms with large contracts with the public sector.

Of the two defining characteristics of the liberal society - private property and voting by majority rule - it is not difficult to imagine how the first may be nurtured in a despotic regime, for the maintenance of a system of private property is in the rulers' own interest as long as their position as rulers is reasonably secure. The evolution of voting by majority-rule is more difficult to explain.

In principle, voting by majority rule with universal suffrage could be instituted all at once in a great outburst of democratic enthusiasm. That

possibility cannot be ruled out, but is unlikely for several reasons: Rulers would probably not permit the required freedom of movement and communication among their subjects. Successful rebellion against a determined ruling class would require a disciplined army of rebels who, if the rebellion succeeds, might be more inclined to set themselves up as a new ruling class than to permit the establishment of a liberal society. Partisans of a successful democratic revolution, being mostly poor, might be unwilling to respect existing property rights or unable to construct a more widespread distribution of property. Thus, even if a system of majority-rule voting with universal franchise were initially established, it would be in danger of destroying itself in conflict over the allocation of the national income and positions of authority. Revolution may be a crucial event within the slow evolution toward a liberal society; a despotic society is unlikely to transform itself all at once. [This paragraph was written before the dramatic events in Eastern Europe during the fall of 1989; mere proof of impossibility is no guarantee that an event will not occur.]

Our account of the origin of majority-rule voting is of an evolution from the top down. Voting is first adopted for decision-making within the ruling class. Franchise is then gradually expanded to take in the entire adult population. I think of this story of the origin of voting as a stylized and encapsulation of the history of England. In the years immediately following the Conquest, England was as despotic as any state in Europe. Thereafter political rights evolved slowly. Barons acquired rights against the King. The King's Council evolved into a Parliament with limited membership and limited powers. Franchise was extended gradually, first to the wealthier members of the community, then, to successively lower strata of

society, and, finally in the present century, to the entire adult population. The model of the birth of the liberal society is an abstraction from these events.⁴

The King is the King because the Barons are prepared to obey his commands. If the Barons could be kept apart from one another (except when necessary to discipline a rebel against the King), then a strict chain of command could probably be maintained intact. If, on the other hand, the Barons must meet as advisers to the King or if the King simply cannot stop them from meeting, then the Barons might assert what would henceforth become their rights: the right to transmit property to their children, a clear specification of their obligations as tax payers, and so on. Furthermore, the Barons cannot exercise collective rights without a mechanism for resolving disputes among themselves and for determining when a collective decision has in fact been made. A voting rule is required.

Whether Barons seek to establish rights against the King depends on several considerations: They would certainly desire security against arbitrary behaviour by the King, against dismissal from the ruling class or confiscation of their estates. They would also wish to keep a large share of the total revenue that is extracted by the ruling class from its subjects. On the other hand, they would have to recognize that defence against their country's enemies or against rebellion at home requires a unified command. The King must not be deprived of the authority and the funds to attend to these matters. Too much liberty for the Barons, who may not always acquiesce peacefully to the will of the majority, may be a recipe for civil war which everyone, King and Barons alike, would wish to avoid. Even when franchise is restricted to the Barons, voting requires a consensus among the Barons as the

extent of their property rights and a prior agreement not to vote about property; voting has to be constrained to prevent a majority of the Barons from utilizing the vote to expropriate the rest. The Barons might agree to transform the King's Council into an embryonic legislature with very limited franchise and very limited powers.

The expansion of the franchise can be thought of as a gradual process generated by fear of rebellion. The process begins with the establishment of the House of Lords. [Our theoretical England has only one House of Parliament.] Members of the House of Lords would of course prefer not to expand the franchise, but, like the King, they may eventually be confronted with the choice between sharing power and succumbing to rebellion. Their best course may be to forestall rebellion by buying off some of the potential rebels, granting franchise to classes of people who would be especially dangerous as rebels or would present the least threat within the legislature. Franchise might be granted to occupants to the next rank down in the hierarchy or to the most wealthy among the unenfranchised portion of the population.

Return to the assumption already employed in modelling the transition from anarchy to despotism that society is organized as a complete ordering of the entire population from top to bottom, and, for convenience, suppose that wealth and rank are perfectly correlated. Society is observed at a stage in its evolution toward universal franchise when part of the population is enfranchised and the rest is not. In a society of N people, Mr. 1 is the richest, Mr. 2 is next, and so on. The right to vote is restricted to the first n_v people; the electorate consists of Mr. 1, Mr. 2 up to Mr. n_v . Think of membership in the electorate as desirable, because parliament passes laws

that augment incomes and privileges of the classes included in the electorate at the expense of the rest of the population. To take the classic example, when it comes time to dismantle feudal arrangements, a Parliament of Lords would naturally decide that property rights reside with the Lords, while a Parliament of serfs would naturally decide that property rights reside with the serfs. Consequently, a person's utility is a function of his wealth, (which can be represented by n since people are ordered according to their wealth) and the composition of the electorate, n_v ; that is,

$$U = U(\text{rank, size of the electorate}) = U(n, n_v) \quad (8)$$

Figure 4 illustrates the utility of the n^{th} wealthiest person (shown on the vertical axis) as a function of the size of the electorate (shown on the horizontal axis). His utility is assumed to be independent of the size of the electorate if he himself is not entitled to vote, that is, if $n_v < n$. His utility increases once he is entitled to vote because now his interests are taken into account in public decisions; $U(n, n_v)$ increases sharply at $n = n_v$. However, his utility declines as the electorate increases still further because there are fewer and poorer people left to exploit.

Utilities of different people are compared on Figure 5. Now points on the horizontal axis represent different people as indexed by their order, n , on the scale of rich and poor, and the vertical axis represents utility. Each curve on the figure is drawn for a given franchise, n_v , and it shows how utility declines with n . The decline is steady and continuous except for a sharp drop in utility where $n = n_v$. The two extremes of franchise are represented by the unbroken curves. The lower curve, labelled $U(n, 0)$, shows utility as a function of wealth (more precisely, of one's order on the scale of wealth) when nobody is entitled to vote. The higher curve, labelled

$U(n, N)$, shows utility as a function of wealth when everybody is entitled to vote. Otherwise all curves are broken. They are drawn on the assumption that any increase in franchise, n_v , (that is, any reduction in the amount of property one must possess in order to be entitled to vote) increases the utility of the newly enfranchised people but reduces the utility of people who were already entitled to vote. The curve $U(n, n_v^1)$ shows the utility of wealth as a function of n when only the first n_v^1 people are entitled to vote and the rest are disenfranchised. This curve starts quite high because voting is a valuable privilege when the electorate is small, but it falls below the curve $u(n, 0)$ for people ($n > n_v^1$) not included in the electorate. The curve $U(n, n_v^2)$ is similar, but $U(n, n_v^2)$ is substantially less than $U(n, n_v^1)$ in the range between n_v^1 and n_v^2 because this range covers those people who are entitled to vote when the franchise is extended to the first n_v^2 people but who are excluded when the franchise is restricted to the first n_v^1 people. In a society where property is respected and where franchise depends on wealth, it is in each person's interest to expand the electorate up to the point where he is included in the electorate but no further.

The franchise expands when a majority of those already entitled to vote can expect to gain from the enlargement of the electorate. The model of utility and franchise as illustrated in figures 4 and 5 does not so far provide the electorate with the appropriate motive because the utility of each original voter decreases, rather than increases, as the franchise expands. Something extra is required. The postulated motive is fear. The electorate is induced to expand the franchise for fear that the disenfranchised part of the population would otherwise rebel and in the belief that the most prosperous among the disenfranchised would be the least

disruptive within the legislature and the most effective of the rebels if they were excluded from the legislature.

The main ingredient of this analysis are the probability of the occurrence of rebellion (p) and the probability of the success of the rebellion (π). At any given time, both probabilities are decreasing functions of the size of the electorate, that is

$$p = p(n_v) \quad (9)$$

and $\pi = \pi(n_v) \quad (10)$

where n_v is the size of the electorate, $p' < 0$ and $\pi' < 0$. Both functions can be thought of as shifting over time or in response to changes in technology so that the equilibrium size of the electorate today is not the same as it was yesterday or will be tomorrow. Now make the following assumptions.

- i) Decisions regarding the size of the electorate are made in accordance with the interests of the median voter on the scale of rich and poor. Voters wealthier than the median voter would probably want a smaller electorate. Voters less well-off than the median voter would probably want a larger electorate. Of course, the median voter is to be understood as the median among the electorate, not among the population as a whole.
- ii) In the event that a rebellion is successful, the expected utility of the members of the deposed ruling class falls to U_s which reflects their new low status as subjects of the new ruling class. Even if the rebellion is unsuccessful, the utility of the members of the ruling class is reduced somewhat, for there is a cost, in income and risk of injury, to suppressing a rebellion. Define the utility of the n^{th} member of the

ruling class in the event of an unsuccessful rebellion to be $U(n, n_v; \#)$.

Necessarily,

$$U(n, n_v) > U(n, n_v; \#) > U_s \quad (11)$$

as long as the ruling class would rather suppress the rebellion than be suppressed by it.

The equilibrium number of voters n_v^* at any given time is that which maximizes the utility of the median voter, $n_v^*/2$. If there is such an equilibrium, it is determined by the maximization with respect to n_v of the expression

$$(1 - p) \left[U(n_v^*/2, n_v) \right] + p(1 - \pi) \left[U(n_v^*/2, n_v; \#) \right] + p\pi U_s$$

where $n_v^*/2$, the first argument of the utility function, is treated as a constant in the maximization procedure. The expression is the expected utility of a voter of rank $n_v^*/2$ as a function of the size of the electorate, n_v . The weights $(1-p)$, $p(1-\pi)$, and $p\pi$ are, respectively, the probabilities that there is no rebellion, that there is a rebellion which is defeated by the ruling class and that there is a successful rebellion. An equilibrium franchise is one for which the value of n_v which maximizes this expression is just equal to n_v^* .

Maximizing this expression with respect to n_v , we immediately derive the result

$$p' \left[U - (1-\pi)U_{\#} - \pi U_s \right] + \pi' p \left[U_{\#} - U_s \right] = U'(1 - p) + U'_{\#} p(1-\pi) \quad (12)$$

U is shorthand for $U(n_v^*/2, n_v)$, $U_{\#}$ is shorthand for $U(n_v^*/2, n_v; \#)$ and U' and $U'_{\#}$ respectively are their derivatives with respect to n_v . The equation may be interpreted as follows: The optimal size of the electorate is that for which the expected increase in safety resulting from a small expansion of the

electorate is just worth the corresponding expected loss of income and privilege. The value of the expected increase in safety, represented on the left hand side of the equality, is the sum of the effect of the reduction, p' , in the probability of rebellion and the effect of the reduction, π' , in the probability that a rebellion would succeed. The first of these gains is $p'[U - (1-\pi)U_{\#} - \pi U_{\$}]$ where the term in square brackets is the expected loss of utility in the event of a rebellion. The other gain is $\pi'p[U_{\#} - U_{\$}]$ where the term in square brackets is the reduction in utility when a rebellion succeeds. The right hand side of the equation is the sum of the expected losses of utility, $U'(1-p) + U'_{\#}p(1-\pi)$, if the rebellion does not occur and if the rebellion occurs but is unsuccessful. The electorate is too small if the risks of the occurrence and of the success of rebellion are both rather high and the gain from reducing these risks by expanding the franchise more than outweighs the loss of privilege to those who were originally entitled to vote. The electorate is too large if the opposite is the case.

Thus our model of the growth of the electorate becomes a model of the forces causing the three terms of equation (12) to change over time. First, and perhaps most important, improvements in communication coupled with ever-increasing urbanization lead to increases in p and π for any given n_v and presumably in p' and π' as well. The disenfranchised constitute a greater danger to the state when they are concentrated in a place where they can hear the call to rebel than when they are scattered about the country, unable to communicate with one another or to rise simultaneously. As $p(n_v)$ and $\pi(n_v)$ increase for any given n_v , the optimal n_v must increase as well. Second, changes in the technology of redistribution may have given the rich less cause to fear the enfranchisement of the poor, thereby reducing U' and

The Utility of a Person of Rank n as a Function of the Size of the Electorate

utility of a person n^0 for all possible values of N_v

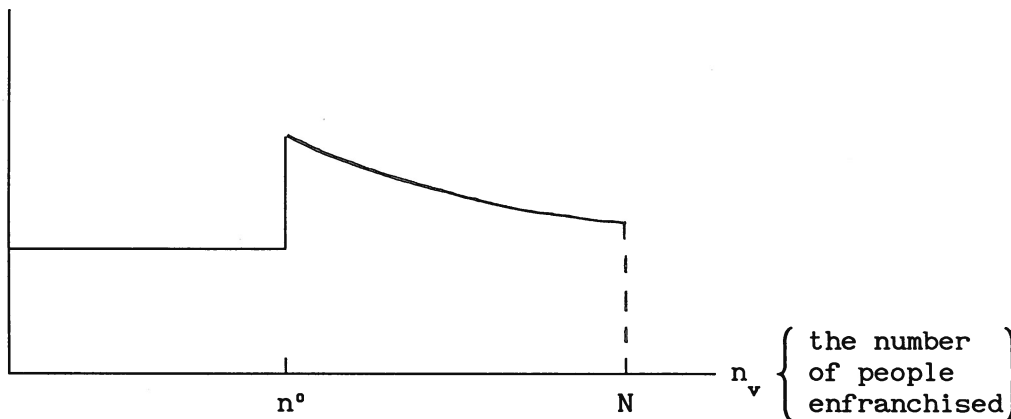


Figure 4

Utility by Rank for four values ($0, n_v^1, n_v^2,$ and N) of the Size of the Electorate

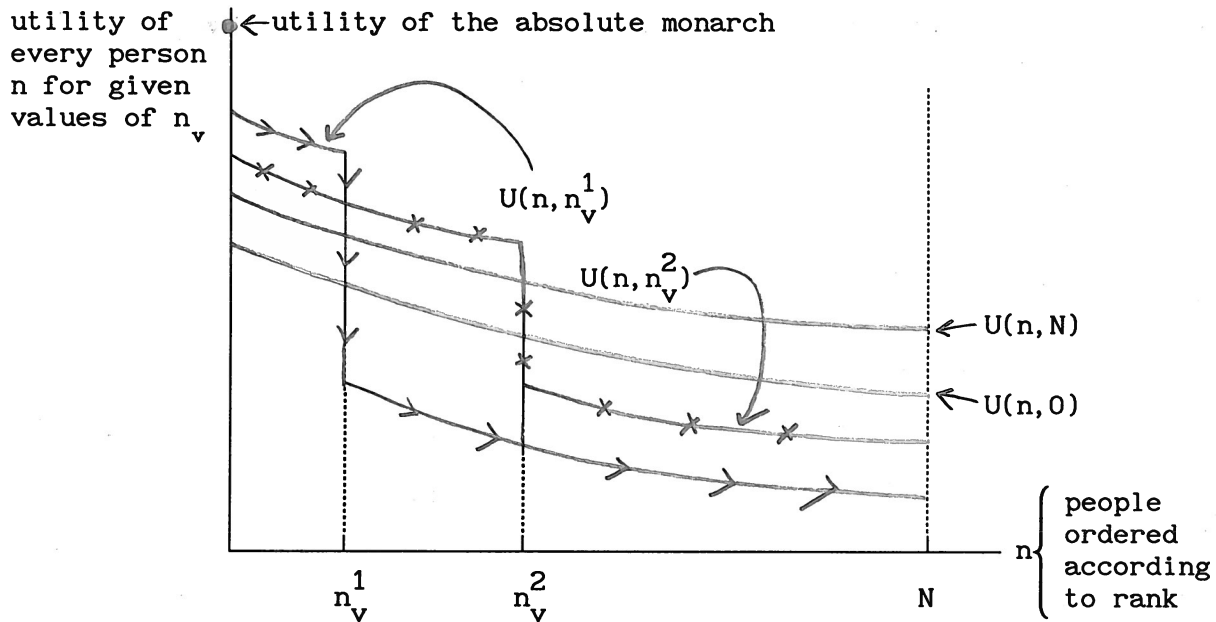


Figure 5

increasing the median voter's preferred value of n_v . It is one thing for the rich to acquiesce to the enfranchisement of the poor when the poor are expected to use their votes to increase the progressivity of the income tax or to raise welfare payments; it is another when the poor, having no other means of redistribution, are expected to use their votes to expropriate the property of the rich. Third, economic growth converts the poor into supporters of the system of private property. The higher the general standard of living the larger is the fraction of the population that can be admitted into the electorate without fear that property will be expropriated. Of course, the dispersion of the income distribution is also relevant, but for any given distribution, as represented, for instance by the Gini coefficient, one would expect support for the institution of private property to increase together with the general standard of living. Thus economic growth lowers U' in our equation and increases the equilibrium value of n_v .

That completes the account of the transformation of despotism into the liberal society. The account is not put forward as an inevitable development of despotism, but as a possibility, even a remote possibility. Despotism does not often evolve into a liberal society. It may persist indefinitely, with the occasional reversion to anarchy and periodic changes in the personnel of the ruling class. Nor is the account put forward as in any way original. I hope the reader's reaction to the account will be that this is more or less what he was taught in school and that I am formalizing what is already well known.

I would emphasize, however, that this story is quite different from the story of the spontaneous emergence of institutions (unless the meaning of spontaneous is widened to the extent that anything at all can be covered by

the term) or from the story of the social contract. My main objection to these stories as explanations of the birth of the liberal society is that they require the introduction of implicit or explicit cooperation in the entire population. It is far more likely that cooperation would begin on a small scale and that the first cooperators, whether they originate as bandits, as is assumed, or as farmers; would cooperate in exploiting the rest of society and not just in passively protecting themselves. The institutions of property and voting are not the natural successors of anarchy, for they are both dependent on a degree of order and security that they cannot themselves supply. Despotism supplies the order within which these institutions may evolve. To be sure, the institutions of the market may evolve spontaneously under the umbrella of the magistrate or the prince. The courts may well come to respect traditional business practice or social customs. But commercial institutions cannot evolve, spontaneously or otherwise, unless a degree of order is first established. The picture I want to convey is of a liberal society as the end product of a complex, long and often nasty evolution. It is characteristic of a liberal society that the correspondence between private and public interest is always less than complete, the distribution of rewards is always less than equal, and the outcome as a whole is not entirely just. Reform is often possible and desirable, but not, as is sometimes supposed, by returning to the state of nature and building a new structure from the ground up.

From the Liberal Society Back to Despotism

About this transition, there is little to explain. The liberal society is necessarily fragile, depending, as it does, on the determination of

citizens to accept the outcome of the vote, regardless of whether the outcome is favourable or unfavourable to their particular interests and concerns. The vote itself must be more important than the subject of the vote. It is a common theme of democratic theory (Berg, 1965) that voting requires a degree of consensus among citizens. The liberal society cannot withstand a division of citizens into two camps with opposing platforms so strongly held that partisans of each would rather fight than compromise or accept defeat at the polls.

The liberal society may be terminated by coup d'état, by civil war leading to a despotism imposed by the victor, by rebellion on the part of a well-organized minority of citizens, or as the consequence of general understanding among citizens, reflected in one final election, that decision-making by majority rule is unworkable and that the true will of the people is reflected in the great leader or the great party. These are not necessarily distinct events. A party could be elected in the knowledge that it will force a change in the form of government and remain in power indefinitely. To succeed, a coup d'état may require support of a large minority of the population. The liberal society is not entirely secure from coup d'état, even in the presence of a high degree of consensus among citizens. In the absence of such consensus, the liberal society could be terminated in any number of ways.

The termination of a liberal society may be the termination of the institution of private property or the institution of voting by majority rule, or both. A strong case can be made for the proposition that public decision-making by majority-rule voting requires private property. The crux of the argument is that voting cannot be employed as a means of allocating

the entire national income among citizens without at the same time destroying the minimal consensus upon which the institution of voting depends. If so, there is no possibility of keeping the institution of voting while at the same time eliminating the institution of private property. The reverse is not true. Democracy can be eliminated while at the same time private property is maintained.

Overthrow of a liberal society may give rise to despotism with or without private property. The latter is usually more burdensome to the subjects and more difficult to displace. First, despotism without private property goes deeper into the economy and exercises a more pervasive influence upon the lives of the subjects. When the institution of private property is preserved, the ruling class may have no greater concern for the rest of society than to preserve order, fight off challenges to its own authority, and, of course, collect a substantial tax revenue. Otherwise, the ruling class is obliged to concern itself with every aspect of life - production, news, education, health and so on - leaving no corner where a person can live independently. Second, private property carries within it the embryo of a new liberal society. A market economy requires a good deal of private communication and private organization which can be turned from commerce to politics, just as in an earlier time, independent religious organizations served as the nucleus of rebellion. Third, the ruling class in a despotism with private property is smaller than it would otherwise be and correspondingly easier to overthrow. There are fewer rulers to be deposed in rebellion and fewer people prepared to support the established regime, for the personnel of the army and of the businesses can expect to be maintained

in their posts. Despotism without property rights is not so easily displaced.

Regular and persistent alternation between a liberal society (admittedly with a certain despotic colouring) and despotism with property rights is a pattern common enough that it is almost a system of organization in itself. Something in the liberal society is amiss in certain countries and seems to call for the suspension of political rights from time to time; something in the resulting despotism is unstable and leads to the reestablishment of the liberal society.

Bibliography

- Axelrod, Robert, The Evolution of Cooperation, Basic Books, 1984.
- Berg, Elias, Democracy and the Majority Principle, Studies in Politics #3, Political Science Institute, University of Goteborg, 1965.
- Buchanan, J.M., The Limits of Liberty, University of Chicago Press, 1975.
- Bush, Winston, "Individual Welfare in Anarchy" in Tullock, Gordon-ed., Explorations in the Theory of Anarchy, Center for the Study of Public Choice, 1972.
- Gough, J.W., The Social Contract: A Critical Study of its Development, Oxford at the Clarendon Press, 1936.
- Hirshleifer, Jack and Martinez Coll, Juan Carlos, "What Strategies Can Support the Evolutionary Emergence of Cooperation?", Journal of Conflict Resolution, 1988, 367-398.
- Hobbes, Thomas of Malmesbury, Leviathan or, The Matter, Form and Power of a Common-Wealth Ecclesiastical and Civil, printed for Andrew Crooke, at the Green Dragon in St. Paul's Church-yard, 1651.
- Hume, David, "On the Original Contract", in E. Barker, ed., Social Contract, 1947.
- Nozick, Robert, Anarchy, State and Utopia, Basil Blackwell, 1974.
- Plato, Crito in Irwin Edman, ed., The Works of Plato, Modern Library, 1928.
- Rawls, John, A Theory of Justice, Harvard University Press, 1971.
- Sagan, E., At the Dawn of Tyranny: the Origins of Individualism Political Oppression and the State, Knopf, 1985.
- Schotter, Andrew, The Economic Theory of Social Institution, Cambridge University Press, 1981.
- Tullock, Gordon, The Social Dilemma: The Economics of War and Revolution, University Publications, 1974.
- Ullman-Margalit, Edna, The Emergence of Norms, Oxford at the Clarendon Press, 1977.
- Usher, D., "The Dynastic Cycle and the Stationary State", American Economic Review, December 1989.
- Usher, D. and Engineer, M., "The Distribution of Income in a Despotie Society", Public Choice, 1987, 261-276.

Footnotes

1. For an enlightening collection of horror stories about civilization at the moment of its emergence from anarchy, see Sagan (1985).
2. A model of the size of nations might be constructed by analogy with Loesch's models of catchment areas of towns. Suppose the army is "centered" on the capital city and its probability of defeating an opponent decreases with the distance from the capital city to the border where the battle takes place. The army's probability of winning a battle becomes $\Phi(n_1, n_2, d_1, d_2)$ where the subscripts 1 and 2 refer to the army and its opponent, the variable n refers to the size of the forces, and the variable d refers to distances from the capital city to the border. There may be an optimal size of countries at which there is no incentive to engage in combat for additional territory.
3. Everyone would be better off if all fights were replaced by lotteries in which each group's probability of winning is precisely the probability that it would have won the fight. Expected incomes and ranks would remain unchanged, but survival probabilities associated with violence would immediately rise to 1. It is interesting to speculate why this never happens.
4. Among the possible organizations of rulers of a despotic society are i) that rulers constitute a Spartan oligarchy of equals who collectively dominate the subject class, ii) that rulers form strict ranks and maintain equality within each rank and iii) that society is ordered from top to bottom. The first assumption was employed in "The Dynastic Cycle" as an analytical device for modelling interactions between rulers and subjects. It is hardly realistic and of no use in the present context. The second was employed in Usher and Engineer (1987) to explain the distribution of income among the ranks in a hierarchy. The King was assumed to set income at each rank just high enough to forestall rebellion. The third was employed in explaining the evolution of despotism from anarchy. The complete ordering of people from top to bottom is a useful starting point for the examine of the extension of franchise, especially if, as is being assumed, a person's wealth is directly correlated with his rank. When there is no sharp line of division between rulers and subjects, the extent of the franchise can lie anywhere on a continuum from absolute monarchy to complete equality among citizens.

