TOWARDS AN INTEGRATED THEORY OF
PROPERTY RIGHTS AND POLITICAL
SYSTEMS

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I. Introduction

The present paper deals with two basic questions. First, why do property rights exist? And second, are there any relations between property rights and political systems?

The first question has been relatively often addressed in modern economic literature. The dominant idea in this area seems to be that property rights emerge because they are "efficient" institutions. In other words, it is thought that the establishment of those rights makes a society function better than it did without them. There is, of course, the question of what it is "to function better", "to make a better use of the available resources", or, simply, to become more "efficient". But fortunately for us the idea of economic efficiency is usually reduced to that of Pareto optimality. Therefore, it is possible to regard property rights as the result of a mutually beneficial agreement between two or more parties. By adhering to a system of property rights each party expects to become better off than he is under the state of anarchy.

This approach seems to suggest that property rights emerge peacefully, without any struggle or group pressure. But this is obviously wrong from an empirical point of view. History is full of examples where property rights emerge as a result of war, conquest, etc.

The approach, however, does not need to be interpreted in such a restrictive manner. A mutually beneficial agreement can be a peace treaty, where a party recognizes the superior
strength of his opponent and submits to the latter's demands. The peace treaty can be interpreted as a Pareto improvement with respect to the situation of war between the two parties.

Generalizing the idea of a mutually beneficial agreement to include something as a peace treaty may be dangerous, particularly when one is trying to explain the origin of an institution. Every institution is the result of a historical process, which often involves group pressure and struggle. And the result of this process, whatever its characteristics, can always be regarded as a mutually beneficial agreement. If it were not, it would have never occurred. Therefore, every institution is "efficient" in the sense that we are using the word.

We shall not develop a full critique of this approach here. In spite of its tautological notion of efficiency, it may be useful as a framework to develop testable hypothesis, grounded on "rational" economic behavior. This is why we shall retain this approach in the present paper.

The question concerning the relation between property rights and political systems has not attracted much attention from economists. In general, economists have been concerned with explaining more the effects of specific legal systems than the reasons why those systems differ among themselves. They have studied what kind of rules are required to have a democracy and, in general, how democracy functions. Nevertheless, the question of why some countries are democracies -
whereas other countries have authoritarian regimes, and whether or not this has something to do with the different property rights structures, has been largely ignored.

In this paper we shall develop a model to explain the origin of property rights. And then we shall use this model to explain the emergence of authoritarian and democratic regimes.

The basic model has a general outline very similar to that developed by Buchanan. It is a two-person model where each party has the option of fighting against the other or cooperating with him, which means accepting the other's territorial claims and respecting them. In this context it is shown that there can be anarchistic equilibria, where some fighting over the land takes place, and property rights equilibria, where territorial bounds are clearly defined and mutually respected. The main difference with Buchanan's model lies in the formal aspects. The model developed in this paper starts out by specifying the production function and the utility function of each individual. Next, the basic behavior patterns are derived in a utility maximization framework. In this sense the model clarifies some aspects which are rather nebulous in Buchanan's work.

What is perhaps more original in this paper, although less elaborated formally, is its latter part (sections VIII through X). There, an attempt is made to explain the emergence of authoritarian and democratic political systems on the basis of the previous model.
II. The individual production functions and utility functions

We shall assume a society with two individuals who obtain their means of subsistence from gathering. The available land is a fixed resource and generates a fixed output, $x$, per unit of time.

Each individual divides his time into "peaceful gathering" and "depredatory gathering". The former activity takes place when one subject accepts the other's territorial claims and gathers somewhere else. The latter activity takes place when fighting is not avoided. That is, when one subject does not accept the other's territorial claims and decides to gather in the same area. In this case there is a fight between both individuals and finally each one obtains more or less product depending on his own strength and ability. We shall represent the time assigned to peaceful gathering by $z^i$, $i = 1, 2$, and call it, for short, "production time".

The time assigned to depredatory gathering will be represented by $t^i$, $i = 1, 2$, and called, also for short, "depredation time". Depredation in this sense should not be confused with stealing. Depredation here is just another form of gathering; a form that involves some "waste" of time, since part of it must be assigned to defense and attack. For each individual it holds that $z^i + t^i = 1$, where 1 represents the subject's total time endowment.
The total output obtained by a subject is the sum of two components: what he obtains by peaceful gathering, \( x_g^i \), and what he acquires by be depredatory gathering, \( x_d^i \).

The former amount is a function of the subject's production time, and of the other individual's depredation time. Thus, we write \( x_g^i = G_i(z_i^j, t_j^i) \), \( i, j = 1, 2 \). The marginal productivity of production time is positive and decreasing, i.e., \( \partial x_g^i / \partial z^i > 0 \) and \( \partial^2 x_g^i / \partial z^i^2 < 0 \). On the other hand, \( \partial x_g^i / \partial t_j^i < 0 \). The meaning of this derivative can be interpreted as follows. The more territory subject \( j \) claims, the more time he has to assign to assert his claims. Therefore, if subject \( i \) wants to avoid confrontation, he will have to gather in further away territories.

The output obtained through depredatory gathering is assumed to be a function of the depredatory time of both individuals. Thus, \( x_d^i = D_j(t_j^i, t_j^j) \). We assume that \( \partial x_d^i / \partial t_j^i > 0 \), \( \partial^2 x_d^i / \partial t_j^i^2 < 0 \), and \( \partial x_d^i / \partial t_j^j < 0 \). The meaning of these derivatives is quite obvious. The marginal productivity of depredation time is positive and decreasing. Besides, the efficiency of subject \( i \) as a depredator is inversely related to the resistance offered by subject \( j \), which is measured by \( t_j^j \).

Functions \( x_g^i = G_i(z_i^j, t_j^i) \) and \( x_d^i = D_j(t_j^i, t_j^j) \) show the productivity of production time and depredation time respectively for subject \( i \), given the depredation effort of the other
party. Those functions do not take into consideration the availability of land. It may occur, for instance, that, given some specific values for \( t^i \) and \( t^j \), one or both individuals are not able to obtain as much output as those functions indicate. In this case land availability would become a binding constraint; and one or both subjects would have to remain partly inactive.

Adding up \( x^i_g \) and \( x^i_d \), we obtain the "production function" of an individual. Now, given that \( z^i = 1 - t^i \), we can write \( x^i = x^i_g + x^i_d = r^i(t^i, t^j), \) \( i, j = 1, 2 \). Figure 1 represents \( x^i_g \) and \( x^i_d \) as functions of \( t^i \), given some fixed values for \( t^j \). The vertical aggregation of \( x^i_g \) and \( x^i_d \) gives us the corresponding total output curve. As \( t^j \) decreases, the curves representing \( x^i_g \), \( x^i_d \) and \( x^i \) move up. Proceeding this way, we may obtain a whole family of total output curves. The highest of them will be associated with a zero value of \( t^j \) and the lowest with a value \( t^j = 1 \). Each total output curve will have a maximum for some \( t^i \) in the interval \([0, 1]\). Thus, for each depredation time of subject \( j \) there is a time allocation, \( t^i \) and \( z^i = 1 - t^i \), that guarantees maximum output to subject \( i \).

Now let consider the preferences of the individuals. Each subject has a utility function \( U^i(x^i, t^i), \) \( i = 1, 2 \) which varies positively with \( x^i \) and negatively with \( t^i \). That is, the subject derives satisfaction from consumption and pain — from the risks and efforts associated with depredatory gath—
Figure 1

Figure 2
erating. This implies upwards sloped indifference curves, which are assumed to be convex. These functions are only defined for values of \( x^i \) greater than or equal to some level, \( x^i_i \), which represents the minimum consumption required to remain physically alive. Figure 2 shows a utility function of this kind.

III. Utility maximization and reaction curves

Each individual has to solve his utility maximization problem. That is, he has to maximize \( U^i(x^i, t^i) \) subject to \( x^i = r^i(t^i, t^j) \), where, by assumption, \( t^j \) is treated as a parameter. The solution to this problem allows us to determine a pair of reaction curves, \( t^i(t^j) \) and \( x^i(t^j) \). The former describes the optimal time allocation of subject \( i \) in response to the observed level of depredation by subject \( j \). The latter represents the optimal output of subject \( i \) also as a function of the observed level of depredation by the other subject.

The graphical derivation of these two curves is developed in Figures 3 and 4. Figure 3 represents the production possibilities and the utility map of individual \( i \). The tangency points A B C D represent the optimal combinations of output (consumption) and depredatory time (risk and effort), for each
level of depredation carried on by the other individual. Although not shown in Figure 3 optimal depredation time could in some cases be zero (possibly for very low values of \( t_J \)) or even one (perhaps when \( t_J \) has relatively high values). Figure 4 represents functions \( x^1(t_J) \) and \( t^1(t_J) \) in quadrants I and II respectively. In this particular case \( x^1(t_J) \) is decreasing and \( t^1(t_J) \) increasing. In other words, when an individual increases his depredation effort, in the case represented in Figure 4, the other party responds by increasing his own depredation and by reducing his total consumption. But, of course, this does not have to be always the case.

IV. Anarchistic equilibrium

In this model we shall consider two types of equilibria. First of all let us describe what we are going to call "anarchistic equilibrium". This situation is said to exist when the following conditions are met:

(i) The time allocations of both individuals satisfy functions \( t^1(t^2) \) and \( t^2(t^1) \) simultaneously. In other words, each party observes how much time the other assigns to depredation and decides his own depredation time accordingly. This obviously means a decision about production time as well. The other party does exactly the same, and neither of them has to vary his time allocation. The reaction of each individual coincides with what is expected from him.
(ii) The outputs of both individuals, added together, do not exceed the total product available from land, \( \bar{x} \). That is, \( x^1 + x^2 \leq \bar{x} \).

Figure 5 represents this type of equilibrium. In quadrants I and II the reaction curves of subject 1, \( x^1(t^2) \) and \( t^1(t^2) \), are shown as described above. And using the same technique we draw a pair of reaction curves for subject 2, \( x^2(t^1) \) and \( t^2(t^1) \), in quadrants III and II respectively. Point \( T_a \) in quadrant II satisfies the first equilibrium condition and represents the corresponding time allocations of both subjects. Given the equilibrium depredation time of each individual, \( t^1_a \) and \( t^2_a \), the output (consumption) of each is also determined by functions \( x^1(t^2) \) and \( x^2(t^1) \). The corresponding consumption levels are \( x^1_a \) and \( x^2_a \).

In order to see whether or not the second equilibrium condition is met by this pair of outputs, a line has been drawn in quadrant IV which satisfies equation \( x_1 + x_2 = \bar{x} \). This is line \( AB \), where \( OA = OB = \bar{x} \). Every point within the triangle \( OAB \) satisfies the condition \( x_1 + x_2 \leq \bar{x} \). The equilibrium consumption bundle, \( C_a \), lies within this area. Therefore, in this particular case we can conclude that an anarchistic equilibrium exists.
Figure 5
V. Stability and multiple equilibria

The equilibrium represented in Figure 5 can be regarded as stable. Some casual analysis may help us to see this point. Let us imagine an initial situation in which subject 2 has assigned a fraction \( t^2_0 \) of his time to depredation. Subject 1 responds by assigning \( t^1_0 \) to the same activity, then subject 2 readjusts his depredation time increasing it up to level \( t^2_1 \) and so on. The process continues until the equilibrium time assignments \( t^1_\infty \) and \( t^2_\infty \) are reached. On the other hand, as both individuals increase their depredation times, their outputs go down until the equilibrium levels \( x^1_\infty \) and \( x^2_\infty \) are reached. A similar analysis can be carried out starting with an initial time allocation by some individual above the equilibrium level. The adjustment process now implies a progressive reduction in depredation times and a progressive increase in output levels until equilibrium is reached.

There is of course the possibility of multiple and unstable equilibria. This is not shown in Figure 5, but can be easily figured out. We shall not explore these possibilities in any detail since our primary concern so far is to show that a stable anarchistic equilibrium can exist and is fully consistent with the standard assumptions of "rational" economic behavior.

VI. Anarchy without depredation

There is however a possibility which deserves some atten-
Figure 6
tion and will be briefly described. It is possible an anarchistic equilibrium with no depredation by any individual. This possibility is shown in Figure 6. In this case the reaction curves \( t^1(t^2) \) and \( t^2(t^1) \) start out at the origin of coordinates. This means that when an individual does not depredate the optimal time allocation for the other implies a depredation time equal to zero. In Figure 6 the origin of coordinates is the only intersection point between \( t^1(t^2) \) and \( t^2(t^1) \). Besides, when \( t^1 \) and \( t^2 \) are both equal to zero the corresponding consumption bundle, given by \( x^1_{\text{max}} \) and \( x^2_{\text{max}} \), satisfies the second equilibrium condition. We have therefore an anarchistic equilibrium with no depredation on either side. In this case land is not really a scarce resource. In fact it is so abundant that no one has an incentive to become a depredator. And each individual can carry his consumption up to the highest level allowed by his productive skills.

VII. Equilibrium with property rights

If we look again at Figure 5 we can see immediately that under the kind of anarchistic equilibrium shown there the output of land is not being entirely consumed. In principle, both individuals could increase their welfare if they agreed to give up fighting, divide the available land between themselves and use their energies only for production purposes. With higher consumption levels and depredation times down to zero both individuals would be better off. In other words, such an
agreement would imply a Pareto improvement with respect to the anarchistic equilibrium situation.

If both indivduals assign their entire time endowments to peaceful gathering, and give up depredation, total output is given by \( x_g^1 + x_g^2 = G^1(1, 0) + G^2(1, 0) \), provided that this sum does not exceed \( \bar{x} \). In case \( G^1(1, 0) + G^2(1, 0) \geq \bar{x} \), land becomes a binding constraint. This means that one or both individuals have to remain partly inactive. In other words, there is not enough land to keep both men busy all the time. In this case there will be, in general, a large number of combinations of production times, \( z^1 \) and \( z^2 \), which can generate the maximum output level \( \bar{x} \). In all these combinations either \( z^1 \) or \( z^2 \) or both will be less than one.

Let consider the case represented in Figure 5. Given \( t^2 = 0 \), if subject 1 were to assign all his time to peaceful gathering his output would be, without any land restrictions, somewhere below \( x_{\text{max}}^1 \). For instance, \( x_{g\text{max}}^1 \). (Let recall that \( x_{\text{max}} \) implies a positive level of depredation).

Similarly, is subject 2 were to assign all his time to peaceful gathering, without land restrictions, and given \( t^1 = 0 \), he would be able to gather an amount smaller than \( x_{\text{max}}^2 \). For instance, \( x_{g\text{max}}^2 \). But in the case represented in Figure 5 \( x_{g\text{max}}^1 + x_{g\text{max}}^2 \geq \bar{x} \). Therefore it is not possible to keep both men busy in peaceful gathering all the time. Nevertheless an agreement may be reached so that each individual gives up
degradation, one or both of them work only part time, and they both gather an aggregate output equal to \( \bar{x} \). This output may then be distributed in a mutually beneficial manner.

Line AB in quadrant IV represents all possible distributions of output \( \bar{x} \) between the two parties. But not all these distributions can be regarded as Pareto optima relative to the initial situation of anarchy. Any point along segment DE is clearly a Pareto optimum with respect to the situation of anarchy. And there may be other points on line AB, both on the right of E and on the left of D, which are also Pareto superior to the anarchy situation. In order to see this, let us take into account that a subject may become better off and consume less if a lower consumption is more than offset by a lower degradation time. Segment DE is therefore part of a longer "contract curve", which contains all the Pareto optimal consumption bundles, relative to the anarchistic equilibrium situation. Each point on this contract curve is a potential "equilibrium with property rights", which may be achieved through negotiations between both parties.

In those negotiations the available land will have to be divided between both individuals. Each one will agree to respect the other's territorial bounds and give up all incursions on them. But the agreement may not necessarily specify that each individual should keep what he gathers. There may be some arrangement to transfer part of the output gathered by one individual to the -
other. In general, the consumption bundle in a property rights equilibrium does not need to coincide with the production bundle.

VIII. Enforcement and authority

Let us assume that a property rights agreement has been reached. Land is distributed so that each individual produces and consumes the amounts corresponding to point P in Figure 5, quadrant IV. The agreement does not require any output transfer. Now, after the territorial bounds have been established and both individuals have stopped degrading, subject 1, for instance, may be tempted to increase his consumption up to $x_{1}\text{max}$. And he may succeed if he carries on some degrada-
tion, while subject 2 does not. But, of course, subject 2 should be expected to react. A process of actions and reactions could now start. And the result of it would be extremely difficult to predict, as it is usually the case with strategic behavior in complex games.

In spite of this difficulty several possibilities may be visualized here. One is regression to anarchistic equilibrium. Another is some form of instability with periods of anarchy followed by periods in which property rights are mutually re-
spected. Still another possibility may occur if both individ-
uals learn from experience that they are better off in the
long run when they respect each other's rights. Then, enforcement may become entirely spontaneous.

But this last solution may be regarded as highly unlikely. In general, enforcement requires authority, and authority requires some kind of power. In other words, someone must have the means to make people respect property rights.

In the two-person society of our model the problem of enforcement can be conceived of as follows. A leader must be found, who desires general respect for property rights and has coercive power to achieve it. But in a closed society the leader has to be one of its members. Thus, if Subject 1 becomes the leader, Subject 2 has to be the subordinate and vice versa. The property rights agreement establishes who is the leader and who is the subordinate. Both individuals agree to give up deprivation, but only the leader keeps his options open to use the force, in case the subordinate does not behave as agreed.

Our hypothesis here is that the leader will be the strongest individual. That is, the individual who can obtain a higher consumption level under the state of anarchy. The strongest person will try to force a property rights agreement that favors him. In other words, he will try to appropriate the largest portion of the total output. And, at the same time, he will claim the right to monitor the other party's behavior,
and to "remain armed", so that he can effectively prevent the other from breaking the agreement.

But the leader must also be prevented from using his power in predatory actions. The final check on the leader's power is always the possibility of rebellion by the subordinate. Of course, this rebellion will be more or less likely depending on how much the subordinate can gain from it and on his own strength. If he is very weak in comparison with the leader, we may expect the agreement to be strongly favorable to the latter. We may also expect in this case a strongly authoritarian enforcement system. For instance, the subordinate may appear as a serf and the leader as an absolute monarch. The former works full time in gathering and transfers part (or most) of the output to the latter, who does not do any "productive" work.²

In a more equal situation the subordinate may appear as an independent producer who keeps all his output and even has some spare time to watch over the leader. The latter in this case may appear as a constitutional chief, who has a superior strength and "governs" with the consent of the other party.

In the extreme case where both individuals are equally strong any enforcement system based on authority would probably break down. No one would accept the authority of the other. Or, if he did, it would be meaningless, for rebellion would be possible any time. Property rights enforcement in
this case would have to be entirely spontaneous, and then there would be the danger of falling back into anarchy.

In sum, from our two-person model the following picture seems to emerge. When the society is very unequal the enforcement of property rights will be based on an authoritarian power structure. And leadership will be based on wealth and strength. But as society become more equal the enforcement system will have to rely more and more on spontaneous mechanisms, which means that the danger of falling back into anarchy increases. There seem to be no room for a democracy in a two-person setting. Of course, we are speaking of democracy in a non-utopian sense. That is, we mean a system where authority is not based on wealth and strength, but originates in some kind of political consensus. We do not mean a system where law and order is spontaneously maintained by every one, without external coercion and without any formal power structure.

IX. The origin of democracy

We would like to know if those (tentative) conclusions of the two-person model can be held in a larger environment.

The answer is not. The following considerations will allow us to modify those conclusions.

First of all, we have to take into account that any property rights agreement, or "constitutional contract" if we use Buchanan's terminology, implies some special problems in an n-person society. The larger the society is, the more diffi-
cult it is to reach any kind of agreement. When a negotiation involves many parties, each one will consider that his influence over the final result is zero. Therefore economic rationality indicates that no one should even bother to participate in the negotiation. Nevertheless human societies have elaborated "constitutions" (implicit or explicit) all along their history. There seem to be a paradox here, that is widely recognized in the public choice literature. We shall not try to solve it in this paper.\textsuperscript{6}

Instead we shall try to eschew the problem by assuming that complex societies emerge through a process of gradual integration of smaller into larger units. In this process negotiations always take place among a small number of persons.

In order to illustrate this idea let consider two small societies of gatherers (each one contains only two persons) isolated from each other. Some change in the environment makes the two societies clash between themselves. A fight over new lands might be the case, for instance. If both societies have an authoritarian power structure, based on a leader-subordinate relationship, there may be a property rights agreement involving only the two leaders. In this contract one of the two bosses may come out as a subordinate to the other. And now we have a larger society with a higher boss and a lower boss. Let imagine, on the contrary, that both societies have failed to reach a viable leadership and live initially in anarchy. The clash between the two is
not likely to produce an agreement on property rights with spontaneous enforcement. If spontaneous enforcement is difficult in the two-person case, it should be more difficult now. Nevertheless, the members of one society might find now an incentive to form a coalition and to exploit jointly their superiority over the other community. In general, the larger the community, the greater the chances are that there are differences among their members. A coalition could also be formed between the strongest members of both societies in order to impose themselves over the weakest members. In any case, if a larger society results from the clash between the two smaller ones, its government is likely to be authoritarian and hierarchical. Otherwise, the larger society would probably never come into being.

In summary, our view is that larger societies develop by gradual integration of smaller ones. This process of integration is generally carried on through negotiations that involve only a small number of leaders. And the result is an increasingly complex hierarchical system, where hierarchy remains based on wealth and strength.

This process seems to exclude the possibility of democracy. In fact, if the above view is correct, the apparent implication is the following. Human societies, to the extent that they can escape anarchy, tend to be organized hierarchically on the basis of wealth and strength.
How can a democracy emerge in this context?

Our view is that democracies emerge from "developed" hierarchical societies through a gradual process. This process is not continuous, but consists of a series of jumps. In a way the process that leads to democracy is the inverse of that leading to a large hierarchical society.

The idea is the following. A change in the environment makes a small group stronger, and this group rebels against the authority above it. A contractual arrangement is reached and this group conquers a number of privileges, i.e., not to pay certain taxes, the right to appoint some representatives to make themselves heard in certain important decisions, etc. According to this view, democracy will develop along a process where successive groups conquer their rights against the prevailing power structure. Each time the negotiations involve only a relatively small grouppressing against the already established authorities. The final result however is a highly diffused power structure and a highly impersonal mechanism. In other words, the control system has become an external referee with its own self-control mechanisms: separation of powers, the opportunity for everyone to participate in certain basic collective decisions, and so on.7

But this process can only take place when the society attains a certain degree of equality (among groups rather
than among individuals). And this is largely the result of a series of historical accidents. As long as there are groups which are much weaker than the rest, they will probably remain "exploited". That is, their members will be treated differently than the rest, and will not possess the same "rights".

X. Conclusions

The previous analysis allows us to derive the following (tentative) conclusions.

First, human societies, as they move away from anarchy, tend spontaneously to adopt a hierarchical structure where authority is related to wealth and strength.

Second, a democratic organization is the result of a series of historical accidents which occur in a fully developed hierarchical society and which tend to equalize the power of the different groups. This means that a democratic organization requires a rather egalitarian society (in terms of factor endowments, rather than specific tastes, and among broadly defined classes of individuals).

The first conclusion is probably true in empirical terms. Democracy in fact is a very recent historical development and even today is restricted to a rather limited part of the world.
The second conclusion is more polemic. The idea that democracy evolves from a fully developed hierarchical society could be contradicted by some examples. For instance, it could be argued that the United States of America were born as a democracy. But one exception does not destroy the rule. In addition to this, the notion that a democracy is only viable in a rather egalitarian setting is also arguable in empirical terms. Some democracies do not seem to be very egalitarian societies. And also some authoritarian regimes (both old and new) seem to be rather egalitarian, at least in terms of income distribution. But again, the case against our conclusion cannot be established on the basis of a few sporadic observations. In any case, this is an open line for empirical research.

So far the paper has not touched on the question concerning the origin of the modern collectivistic states. Nevertheless, it allows us to advance some ideas in this area, which might eventually be articulated in a more elaborate theory. We might for instance, speculate that the collectivistic state originates when a group achieves enough power to impose its rule over the rest of the society. Of course, in such a case the group members could be expected to try and appropriate most of the available land resources. But this does not have to be always that way. A different
arrangement might be the following. The members of the dominant group do not appear as the formal owners of any resources at all, but they entirely control their use and the distribution of the final product. In other words, the dominant group appears as a body of administrators, who jointly control the society's resources. And these resources are said to belong to society as a whole.

One might wonder why the controlling group does not allow individual appropriation by its members; and why joint control, presumably within a hierarchical structure, is going to emerge. A reason for this may be the following. It may occur that the group requires a high degree of coordination and integration among its members in order to have effective power. This may be the case if the dominant group is, for instance, a military or a civil bureaucracy. The power of such groups always rest on an intricate net of ties interlinking their members and restricting competition among them. In such circumstances it is not unlikely that joint control over the available resources might appear a better alternative, for the group as a whole, than individual appropriation.

According to this view the collectivistic state is likely to be based on a hierarchical power structure, strongly authoritarian, and is not likely to function in a democratic context. Historical experience so far seem to confirm that view.
Notes

1. Most of this literature is primarily concerned with explaining how property rights affect individual behavior, rather than why property rights emerge. Nevertheless, the latter question has been clearly addressed in several occasions. See for instance H. Demsetz (1964), S. Pejovich (1972), and J. M. Buchanan (1975). H. Demsetz's paper can also be found, together with other interesting contributions in this field in E. G. Furubotn and S. Pejovich (1974).

2. This is the case of A. Dow's pioneering work (1957). The same could be said about another "classic" in the public choice literature, such as J. M. Buchanan and G. Tullock (1962).

3. Anthropologists, in contrast with economists, have often addressed the question of why laws and enforcement systems vary in different societies. See for instance, K. Newman (1983). Newman has studied a large sample of primitive societies and has found that the complexity of the law and order apparatus increases as the society's "surplus" becomes greater and as wealth distinctions grow larger.

5. A graphical representation of this case can be found in Figure 7. Here anarchistic equilibrium is represented by points $T_A$ and $C_A$ in quadrants II and IV respectively. Point $C_A$ indicates that the consumption level of subject 2 is much lower than that of subject 1. The latter is therefore the strongest, according to our previous definition.

An equilibrium with property rights is assumed to exist at point $C_P$ in quadrant IV with subject 1 as a leader and subject 2 as a subordinate. Point $C_P$ indicates the consumption level of each individual— which does not coincide with the corresponding production level. In this particular case, subject 2 assigns all his time to production and, of course, does not deprecate. He gathers the total output of land given by distance $DA$, which, by assumption, is equal to $x_{max}^2$ (the maximum of $G^2(t^2, t^1) + D^2(t^2, t^1)$ given $t^1 = 0$) and coincides with $x^2_{max}$ (the maximum of $G^2(t^2, t^1)$ given $t^1 = 0$). But subject 2 only consumes $x^2_C$. The difference $x_{max}^2 - x^2_C$ is transferred to subject 1, who does not produce anything, and consumes $x^1_C$. Both individuals are better off than be-
Figura 7
fore, for their consumption levels have gone up and their deprecation times have gone down to zero. The subordinate is working full time in production, but production time, by assumption, does not generate disutility. The leader, on the other hand, does not work in production but uses up all his time in surveillance and leisure activities. By assumption surveillance time does not generate disutility and leisure time does not generate satisfaction.

6. For an extensive discussion of this point see Margolis (1982).

7. We can explain the gradual formation of a hierarchical society without having to resort to any kind of "altruistic" motivations. To this extent we can eschew the "paradox of voting". However, the functioning of a full-grown democracy cannot be understood in terms of purely egoistic behavior. A democracy does not function if people do not vote, and people who are narrowly egoistic would never bother to vote. Thus, for our model to work we must assume that, as a democracy develops, people also develop some kind of "collectivistic" motivations. And this is what induces them to participate in the democratic process. The need of -
some kind of collectivistic motivations to explain democratic voting is implicitly recognized by Downs (1957) when he makes the argument that people vote out of a sense of "social responsibility". Notwithstanding, Downs postulates that human behavior is primarily directed towards "selfish ends". The vagueness in the definitions of selfishness have always created much confusion in this area. But there is little doubt that that term must be qualified if voting is to be understood as a selfish form of behavior. Margolis (1982) develops a generalized model of rational behavior that can explain both egoistic and altruistic actions.
References


