Hayek and Institutional Evolution*

by Roger A. Arnold

Department of Economics, Hillsdale College

Casual observation of the last thirty years or so indicates that the role government plays in the lives of individuals has been increasing. Within the internal structure of government itself there are a number of reasons for this, but perhaps the overriding factor that has given way to this state of affairs is the fact that a large part of the public looks to government as the ultimate "problem-solver." Political entrepreneurs have been quick to respond.

The increasing size and power of government is viewed with trepidation by many persons. They note that government which moves far beyond the limits of protecting its citizens, and into the areas of redistribution, regulation, and management of the economy is likely to bring with it inefficiency in the allocation of resources, diminished production, less wealth, less incentive to work and the increased probability of inflation. To these persons there exists such a phenomenon as "government failure."

Perhaps because of the undesirable consequences of government's growth, many of these persons appear to place undue faith in the "invisible hand" as generator of efficient and desirable institutions-orders-outcomes. Government, beyond the limits of the protective state, is seen then as interfering in a desirable social process.

Nobel Laureate F. A. Hayek, principally in the first two volumes of Law, Legislation and Liberty, has put forth the view that the outcomes of the invisible-hand process—that is, emergent or spontaneous outcomes, or more descriptively, "the unintended consequences of human action"—are both efficient and desirable. This is a major theme of Hayek's work in social philosophy.

The Hayek Position with respect to emergent institutions-ordersoutcomes has not been critically examined. For the most part, the framework in which Hayek develops the position has gone without scrutiny. This is an oversight that needs to be remedied and the discussion here is an attempt at doing so.

The objectives of this discussion are threefold: first, to illustrate that Hayek does hold the position with respect to institutional evolution at-

^{*}The author would like to thank Professor James M. Buchanan for helpful comments given at all stages of the development of this paper.

tributed to him here; second, to note the assumptions, preconditions and philosophical inclination implicit in that position; and third, and most generally, to note beyond the scope of Hayek's work in social philosophy the full consequences and ramifications of the invisible-hand, or evolutionary, process. More simply, the discussion seeks to prove that the Hayek Position is not, at base, a commendation of the evolutionary process, as so often has been believed. This conclusion is obvious once it is noted that there are two standard definitions of the evolutionary process, only one of which is meaningful.

In order to assure the clarity and understanding of the full argument presented here, the discussion will progress in necessary stages. The reader should be aware that certain preliminaries will have to be attended to before the thrust of the main argument may be advanced: namely, clarification of issues pertaining to terminology. Also, throughout the discussion, it will be necessary to quote Hayek numerous times in order to make certain points.

Terminological Issues

Hayek speaks of institutions-orders-outcomes within a Rationalist-Antirationalist framework, or classificatory system. Within this system, institutions-orders-outcomes either emerged or were constructed; they either evolved or were made.

When outcomes are spoken of as having emerged or evolved, this refers to their having been spontaneously generated by the actions of many individuals where it was the case that no individual had an idea of what his actions, combined with those actions of others, would produce. As Hayek has stated, "In a very definite sense, purposive institutions might grow up which owed little to design, which were not invented but arose from the separate actions of many men who did not know what they were doing." They are, in Hayek's terminology, "unintended consequences of human action."

A commonly cited example of an emergent institution-order-outcome is money. In the process of an individual's seeking to obtain his preferred bundle of goods, he learns to exchange less marketable goods for those that are more marketable. Such exchange allows the individual to obtain more rapidly and at less cost his preferred bundle of goods. Through this process, money emerges. As Menger noted: "As economic culture advances, a definite item or a number of items leaves the sphere of the remaining goods and becomes money, without legislative acts."

Money may be seen to be a substantial improvement over barter in that it is both a resource-saving device and a means for increasing market activity. By being the one good for which all other goods exchange, money makes superfluous the double coincidence of wants characteristic of barter exchange. Money makes it possible to release labor and capital from the process of distribution to that of production in that it economizes on the use



of these resources in the search-bargain process of exchange. By reducing the cost of exchange it leads to an increase in the number of exchanges that will be made and thus to an increase in utility for the individuals making the exchanges. Similarly, by being an asset which everyone is willing to accept as a means of payment, money enhances the opportunity for successful borrowing, which in turn enhances market activity.

To say that an institution has emerged does not mean to imply that no individual could have had the idea of the institution before its appearance. The fact that an individual or individuals possessed some mental construction or imagination of the institution before it appeared does not prevent the labeling of an institution as emergent; so long as the individual or individuals with the mental construction of the institution did not affect the eventual composition of the institution by a direct act on their part, the institution may be said to have emerged. For example, even a person living in a pure barter economy might have imagined how nice things would be if a money existed, but acting alone he could do very little toward introducing the institution.

Constructed institutions, for Hayek, are those that are made or designed to meet a specific and known objective. A constructed institution is designed with a particular end in mind. Here an important distinction needs to be made between construction on an individual basis and construction on an aggregate basis. There is a difference, for example, between an individual's planning a day's activities for himself and his planning a society. Construction on an aggregate scale implies that persons other than the constructor are subject to the construction. Construction on an individual scale subjects only the constructor to the construction.

At one level, then, the differences between emergent and constructed institutions-orders-outcomes are distinct. Constructed institutions-orders-outcomes are "designed," "made," or "blueprinted," while emergent institutions-orders-outcomes are not. Construction seeks a specific end, and emergence does not. Here the differences are clearly and easily seen. At another level, however, they are not.

In a sense, all institutions-orders-outcomes might be said to have emerged. This is the case if evolution is defined broadly. All that exists is said to have emerged; existence confirms evolution. Here, evolution is an end, rather than a process that gives way to certain types of outcomes.

When defined broadly, however, evolution loses its true meaning. If everything that exists may be said to have emerged then there is no way to differentiate between that which exists and was intended and that which exists and was unintended. With such a definition, questions as to the rationale for the existence of something would not be forthcoming. At this level it would make sense to speak of the "evolution of constructed institutions." Even an institution such as Social Security could be said to have emerged.

Similarly, all institutions-orders-outcomes might be said to have been

constructed. Those individuals that exchanged less marketable goods for those of greater marketability are occasionally said to have constructed the institution of money through their actions. This interpretation uses the word "construction" in the broad sense. What separates "construction" here from the way it was employed earlier is the lack of a blueprint.

Throughout the discussion, the terms "constructed" and "emergent" will be used in the narrow sense, since this is consistent with Hayek's use of the terms. So then, an institution-order-outcome has emerged if it was spontaneously generated by the actions of individuals, where it was the case that no individual had an idea of what his actions, combined with those of others, would produce. An institution is said to have emerged if it was an "unintended consequence of human action." An institution-order-outcome is, on the other hand, constructed if it has been designed on a larger than individual basis with a specific end in mind; a blueprint has been drawn up and the details of it followed.

The Hayek Position

Hayek has stated that the ultimate purpose of science is to make the world understandable. In order to do this, it is important to proceed by way of the proper scientific method, and for Hayek this entails acknowledging the limits of reason. "The Socratic maxim that the recognition of our ignorance is the beginning of wisdom has profound significance for our understanding of society." This is the foundation stone of the Hayek Position.

It is with the Socratic maxim in mind that Hayek so forcefully argues against the position—most commonly referred to as Rationalism—that elevates human reason to a supreme station. For Rationalists human reason, most often defined as logical deduction from explicit premises, is the only criterion by which to understand and subsequently to judge institutions-orders-outcomes.

Hayek is most assuredly an Antirationalist. For him, the failings of Rationalism are numerous. He denies the Rationalist precept that all knowledge is of the type that can be written down, is factual in nature, and can be both taught and learned. The Rationalist position, of course, implies that man can be cognizant of all knowledge. Hayek heartily disagrees. To an Antirationalist like Hayek, knowledge may exist and be utilized without man's awareness of it.

The different views on knowledge and the role of reason held by Rationalists and Antirationalists naturally lead to different positions with respect to existing institutions-orders-outcomes. Rationalists, for one, tend to interpret them in a wholly constructivist light. They note that before something can exist and serve a purpose it must be designed or constructed to do so. Within the Rationalist framework, "good things don't just happen" (outside the conscious attempts of man).

Antirationalists note that many institutions-orders-outcomes have had



at their base neither human reason, as this term is understood by Rationalists, nor human intention. Knowledge, which is largely invisible, may be subsumed within them, however; and this knowledge may serve a purpose. Within the Antirationalist framework, "good things do oftentimes just happen" (outside the conscious attempts of man).

For Hayek, emergent institutions-orders-outcomes bring to bear much of the widely dispersed knowledge in society—knowledge which is necessary to cope with the contingencies of an uncertain world. And because this knowledge is of a type that cannot be articulated, nor even known in some cases, it follows that tampering with orders that contain it is likely to do great and lasting harm. As Hayek has noted, "We shall never be aware of all the costs of achieving particular results by such interference." A basic theme of Hayek's work in social philosophy seems to be: leave well enough alone.

This implies that Hayek puts great faith in social evolution. It is unlikely that one would warn against tampering with emergent institutions-orders-outcomes if it were not thought that they were superior to what tampering would produce. The faith in social evolution Hayek exemplifies may be seen specifically in his description of "the law."

According to Hayek, "the law," which is something very different than legislation, evolved, and in that it did, it contains much of the knowledge that is missing in legislation. Also, in that it is simply the articulation of longstanding rules, the "law" is just; and in that it has "passed the test of time." it is efficient.

The longstanding rules, as articulated in "the law," have evolved for a reason; namely, for the preservation of the group. This is assured because these rules are "a device for coping with out constitutional ignorance" — an ignorance, which if left unattended, would certainly lead to disharmony amongst the members of the group and to the eventual breakdown of the social order. General adherence to longstanding rules is a means by which this breakdown is prevented. Such rules assure not only the preservation of the group, but its progress as well. Over time the "best" rules are accepted and followed because of the desirable results they produce. These "best" rules become "the law." It is the trial and error process of evolution that leads Hayek to conclude that only those rules that facilitate the exploitation of the greatest amounts of knowledge will survive. All other rules will be discarded as being unsuccessful in the pursuit of given objectives.

These statements accurately summarize Hayek's thinking with respect to institutional evolution. Evolution will "choose" those emergent institutions-orders-outcomes which are the most successful in bringing the most relevant knowledge to bear on the problems at hand.

It is in this sense that Hayek notes the inferiority of legislation to "the law." Legislation, which may be described as "made" law, lacks the knowledge and the justice inherent in "the law." It is through Hayek's dis-

cussion of legislation, however, that one may see that he goes beyond simply noting the benefits of "the law," and attributes efficiency to it as well.

Economists usually speak of efficiency in a Pareto sense; that is, something is said to be efficient if there exist no possible rearrangements which could make one person better off without harming another person. It is in this light that Hayek's warnings against tampering with "the law" implicitly assume it to be efficient. For Hayek, a move away from the existing emergent order of "the law" may do great damage.

To develop this point further, it is noted that movements away from "the law" mean either legislation or anarchy, both of which are undesirable to Hayek. Hayek's stand on legislation is well documented. He notes that: "It gave into the hands of men an instrument of great power which they needed to achieve some good, but which they have not yet learned so to control that it may not produce great evil."

Hayek's position on anarchy is similar to his position on legislation. This may be seen by noting that for him in the state of anarchy there can be no freedom. It is "the law" that is necessary for the preservation of freedom. In that this is the case, anarchy is an undesirable situation for Hayek, for it means the end of that which he holds to be important to the life of the individual. Thus, in that both anarchy and legislation bring with them the decline of freedom, they are both undesirable. Movements away from "the law," in that they are likely to do great harm, are therefore seen to be inefficient.

To Hayek, as an antirationalist-evolutionist, not only "the law," but all emergent orders have special attributes which recommend them. Throughout Hayek's writings there are numerous references to emergent orders which have been the greatest achievements of man.

The Hayek Position can more clearly be perceived, however, by noting the relationship between emergent institutions-orders-outcomes and the Great (Good or Open) Society. The "Good Society is one in which the chances of anyone selected at random are likely to be as great as possible." It is the society "in which we would prefer to place our children if we knew that their position in it would be determined by lot." For Hayek, then, a move towards the "Great Society" would seem to benefit all persons in the sense that "for any person picked at random, the prospects that the overall effect of all changes required by that order will be to increase his chances of attaining his ends." In the language of welfare economics, such a move is Pareto-superior; the "Great Society" is efficient. And the efficiency characteristics of the "Great Society" come about through the emergent orders which comprise it. They are the orders that "produce" the efficiency of the "Great Society" and in the process cause efficiency to be ascribed to them.

The relationship is even more clearly perceived when it is remembered that the "Great Society" does not aim at particular results, but, rather, at "increasing the chances of those picked at random." Emergent orders assure this. As Hayek has stated in this regard: "A policy making use of the spon-



taneously ordering forces therefore cannot aim at a known maximum of particular results...."13 (Emphasis added)

Proceeding one step further, Hayek believes that individual freedom is maximized only in the "Great Society," which, as was noted, relies for its existence and preservation on orders that are largely outside the grasp of human reason. With characteristic faith in the social evolutionary process, Hayek states that "freedom means that in some measure we trust our fate to forces which we do not control," that is, to spontaneous forces.¹⁴

The Preconditions of the "Great Society"

The Hayek Position attributes efficiency to emergent institutions-ordersoutcomes. "Unintended consequences of human action," in that they allow individuals to utilize the most knowledge possible and are largely coercionfree, are the "best" results man can hope to attain.

Hayek, then, would appear to be an evolutionist; after all, he does speak of an "evolutionary process" through which institutions-orders-outcomes appear. A close reading of Hayek's works, however, would lead one to question to what degree, if any, Hayek is an evolutionist in the strict sense of this word. It would seem that Hayek's whole notion of emergence holds only if the environment in which institutions-orders-outcomes "emerge" is specified to be of a certain sort. In that this is true, Hayek cannot be an evolutionist in the full sense of this word. One cannot be an evolutionist and specify a required set of environmental constraints, too.

There are two ways of viewing evolution, only one of which is meaningful. Both ways, however, refer to evolution as a process in which something develops from one stage into another, and so on. One way of viewing this process is within a specified environment. The "evolution" of something occurs, given certain specified conditions. Here the outcome of the "evolutionary process" is determined in the sense of being bounded within certain limits. The second way to view the "evolutionary process" is as taking place within an unspecified environment. Here, where there are no specified conditions, the outcome is largely undetermined. This would seem to be the only meaningful way to view evolution: Evolution, if it is to mean anything at all, must take place within an unspecified environment. Failing this, the phenomenon at hand would have to refer to something else; in fact what it does refer to is construction of a certain type.

This construction is of a less visible type than was spoken of earlier, yet it is construction in that it specifies; notably it specifies the constraints within which "evolution" is to take place. It does not guarantee an "end" or "end-state," but, rather, it bounds or limits the range of "ends" or "end-states" that may come about. It specifies what cannot exist, not what will exist. This latter type of construction is referred to as "non-teleological construction," as opposed to "teleological construction," which is the former type.

It is this non-teleological construction that Hayek employs. Hayek's specification of the environment in which the "evolutionary process" is to take place guarantees him efficient outcomes. That which might lead to a less than desirable or efficient outcome is filtered out by the generalized constraints that bound the process. Hayek is, then, in no contradiction of terms, an antirational, non-teleological constructivist.

As in most cases, the burden of proof lies with the one who advances the claim. It now needs to be proved that Hayek does specify his environment in such a way that it guarantees efficient outcomes. The proof is seen, for the most part, by noting the choice of framework Hayek adopts to discuss matters pertaining to social philosophy.

The Hayekian framework is made up of a trinity of concepts: liberty (or freedom), general rules, and competition (in the sense of free entry and exit). And the existence of these three is conditioned upon the acceptance of a certain moral code.

Of the three concepts, it is liberty which is the most important in Hayek's mind. Liberty is important not only in and of itself, but also for the benefits it provides man. Liberty, Hayek notes, gives civilization its "creative powers"; liberty provides a society with its ability to progress. In the Hayekian scheme of things, progress occurs only when individuals are allowed to make use of the knowledge which they possess for their own purposes. Liberty and progress go hand-in-hand.

The "Progressive Society," properly defined, is equivalent to the "Great Society." It was found that in the "Great Society" the chances that anyone picked at random will achieve his own goals were as great as possible. It is only the society that progresses, however, that can meet this condition of the "Great Society." Hayek states that "the enjoyment of personal success will be given to large numbers only in a society that, as a whole, progresses fairly rapidly." It is liberty, then, that engenders progress, which in turn is seen to be necessary for the existence of the efficient order of the "Great Society."

While liberty is necessary for the existence of the "Great Society," it is general rules that are necessary for the existence of liberty. General rules—the second concept stressed by Hayek—refer to a state where rules, not men, govern the lives of men; and these rules are general, they possess certainty, and they treat individuals equally.

For Hayek, only where general rules are applied will efficient orders emerge, because liberty, which is necessary to the generation of efficient emergent orders, is possible only when general rules exist. "There is only one such principle that can preserve a free society: namely, the strict prevention of all coercion except in the enforcement of general abstract rules equally applicable to all." 16

The link between liberty, general rules and the "Great Society" may be seen in another, less direct way. Hayek sharply criticizes existing orders that



do not meet the conditions applied by general rules, and which therefore do not exemplify a key characteristic of the "Great Society." By viewing Hayek's criticisms of existing orders which are irreconciliable with applied general rules, one may conclude that only those orders that satisfy the "discipline of general rules" are outside the realm of Hayek's critical remarks and thus, by implication, efficient.

Hayek is most critical of the labor union. Of it he says that "from a state in which little the union could do was legal if they were not prohibited altogether, we have now reached a state where they have become uniquely privileged institutions to which the general rules of law do not apply." The present characteristics of the labor union, which Hayek holds to be largely coercive in nature, could come about only because general rules were not observed.

Sharply criticized also are institutions that seek as their objective "social justice." "It is impossible," Hayek states, "for the Great Society to maintain itself while enforcing rules of 'social' or distributive justice." ¹⁸

Social justice, which Hayek calls "empty and meaningless," and general rules, are mutually exclusive in the sense that "social justice" is an outgrowth of specific, non-abstract rules. There are only two types of rules: specific (non-abstract) rules and general (abstract) rules. From such different rules, different types of orders arise. Hayek's vehement criticism of "social justice"—which, it is repeated, is built upon specific, non-abstract rules—may be seen to prove that Hayek must be working strictly within a framework characterized by general, abstract rules when he notes the efficiency of emergent orders. All else calls forth criticism.

The third concept which the Hayekian framework emphasizes is competition, in the sense of free entry and exit. Competition may be viewed in much the same way as was liberty: first, as necessary for the "evolution" of efficient orders and, secondly, as dependent upon general rules for its existence.

Addressing the second point, it is noted that "the functioning of competition not only requires adequate organization of certain institutions like money, markets and channels of information—some of which can never be adequately provided by private enterprise—but it depends, above all, on the existence of an appropriate legal system, a legal system designed both to preserve competition and to make it operate as beneficially as possible." ¹⁹

Addressing the first point, given the "appropriate legal system," which in Hayek's terminology means that only general rules are applied, competition acts so as to guarantee that the "widely dispersed knowledge," which is needed for the efficiency of emergent orders, is forthcoming. While speaking of the emergent market order, Hayek states that "it is by this conveying of information in coded form that the competitive efforts of the market game secure the utilization of widely dispersed knowledge." ²⁰

In this regard, competition also provides the choice that is necessary for

emergent orders to have "passed the test of time." "Passing the test of time," which Hayek holds to be an indication of the efficiency of an emergent order, means something only if through time competition is present. The absence of competition, which is a result of the removal of general rules, is tantamount to granting special privileges and must render the test of time with respect to emergent orders meaningless. It is only competition, itself a by-product of general rules, that gives meaning to the "evolutionary process" through which institutions-orders-outcomes can evolve into higher and higher stages.

Liberty, general rules and competition, then, are necessary conditions before which emergent orders may be considered efficient. In that liberty and competition can exist only if general rules exist, it may be said, without any loss in truth, that general rules are the necessary and sufficient condition for the emergence of efficient orders. Only in a specified environment—that is, one where general rules are applied—can efficient orders emerge.

The Reality of General Rules

The notion that Hayek is a non-teleological constructivist is false if general rules can be shown to have emerged in an unspecified environment. In an attempt to show this, it is necessary to address the question: What, if anything, is the precondition for the emergence of general rules? A certain moral code is the answer; specifically, one that places (abstract) justice over (concrete) loyalty, thus in the process prohibiting all privilege. To address a specific issue, holders of this moral code must accept as sacrosanct the dictates of the "marketplace," whether these dictates are in one particular instance favorable or unfavorable to them.

It is not impossible that general rules would emerge, but simple observation is evidence that they do not exist at present. Recent years have certainly not seen the observance of the moral code that is necessary to the acceptance of general rules — witness numerous special interest groups, many of which would not exist if privileges were not being granted them.

A partial reason for the non-observance of general rules is grounded in economic theory. General rules, which are of recognizable benefit to many persons only in the long run, are a burden—to be disposed of—for individuals who exhibit short-run behavior.²¹ Moreover, once some individuals have decided not to observe general rules, this decision, then, makes it more costly for others to continue to observe them. The generalized prisoners' dilemma case, so prominent in public choice theory, offers a substantive explanation. Put simply, it is at times rational for one to decide not to adhere to general rules; and the moral code that prevents such behavior usually erodes in a society in which one is increasingly hampered by following it. Utility maximization and general rules are not always coincident.

This observation leads to a conclusion of sorts. If general rules, which



are necessary to the "emergence" of efficient institutions-orders-outcomes, are at odds with utility maximization, then general rules are likely to give way. This implies that inefficient and undesirable outcomes may be the result of simple utility maximization.

This fact brings forth the gravity of the situation at hand. Outside a direct change in the preferences of individuals, institutional evolution is not likely to generate only efficient and desirable institutions-orders-outcomes. This conclusion, of course, is reached by assuming that it is meaningful to speak of institutional evolution as taking place only within an unspecified environment.

Conclusions

The Hayek Position, which states that emergent institutions-ordersoutcomes possess efficiency characteristics, is built upon a limited view of the evolutionary process. Here, the evolutionary process takes place within a specified environment; namely, one where general rules are adhered to. The environment guarantees that only efficient institutions-orders-outcomes will emerge.

This is a successful attempt at non-teleological construction, and should be labeled as such. Non-telelogical construction is, perhaps, the result of a general increase in knowledge; or, specifically, of a deepened understanding of causal relationships. When it is learned that X will lead to Y and Y is felt to be undesirable, there is an inclination to prevent Y by prohibiting X. Hayek's specification of the environment in which efficient institutions-orders-outcomes emerge may then be seen as an implicit admission of the inefficiencies sometimes generated by unspecified institutional evolution.

NOTES

- For an exception, see James M. Buchanan, Freedom in Constitutional Contract: Perspectives of a Political Economist (College Station, Texas, and London: Texas A & M University Press, 1977), pp. 25-39.
- F. A. Hayek, The Constitution of Liberty (Chicago: Henry Regnery Co., 1960), pp. 58-59.
- Karl Menger, Problems of Economics and Sociology (Urbana, Illinois: University of Illinois Press, 1963), p. 153.
- 4. Hayek, Constitution of Liberty, p. 22.
- Hayek, Law, Legislation and Liberty, vol. 1, Rules and Order (Chicago: The University of Chicago Press, 1973), p. 57.
- It should be noted here that "the law" for Hayek manifests itself most nearly in English common law.
- 7. "At this stage it is sufficient to see that rules did exist, served a function essential to the preservation of the group, and were effectively transmitted and enforced, although they had never been 'invented,' expressed in words, or possessed a 'purpose' known to anyone." Hayek, Law, Legislation and Liberty, 1:75.
- 8. Hayek, Law, Legislation and Liberty, vol. 2, The Mirage of Social Justice (Chicago: The University of Chicago Press, 1976), p. 8.
- 9. Hayek, Law, Legislation and Liberty, 1:72.

- 10. Ibid., 2:132.
- 11. Ibid., 2:132.
- 12. Ibid., 2:114,
- 13. Ibid.
- 14. Ibid.
- 15. Hayek, Constitution of Liberty, p. 41.
- 16. Ibid., p. 284.
- 17. Ibid., p. 167.
- 18. Hayek, Law, Legislation and Liberty, 2:137.
- 19. Hayek, The Road to Serfdom (Chicago: The University of Chicago Press, 1944), p. 38.
- 20. Hayek, Law, Legislation and Liberty, 2:117.
- 21. The fact that individuals do not follow long-run rules is, to a great extent, an indication that they tend to be short-run in nature. The perhaps interesting question of why individuals exhibit short-run behavior is beyond both the scope of this discussion and the author. Unrelated to this, but an interesting note, is that the inclination for individuals to be short-run in nature may be largely due, at a primary level, to the fact that many individuals do not see the full price of such behavior. This being true, they would, of course, choose more short-run actions than if this were not true.

