THE EVOLUTIONARY SUCCESS OF ALTRUISM AND URBAN SOCIAL ORDER

by F. T. Cloak, Jr.

Donald T. Campbell's address has had exactly the effect he intended, upon me at any rate. Like most of his cross-disciplinary writings, it juxtaposes ideas and facts in new ways, practically forcing the reader (especially the would-be critic) to respond creatively.'

On my first reading I simply agreed with everything Campbell says. Everything: I have always agreed with his premises—his hard-science epistemology, his Darwinian "blind variation and selective retention" evolution and his recognition that learning is a form thereof (or at least analogous thereto), and his belief that the social organizations of humans and amoebas can be explained by the same basic processes. The logic of argument, too, seems impeccable. The conclusions are humbly put, most tentative, laced with "perhapses" and "maybes," and set in a context of skepticism; he is not really making assertions but only questioning the current conventional professional wisdom. So what is there to criticize?

After a second reading and a great deal of thought I realized that Campbell's conclusions, tentative or not, are too important, too intriguing, too exciting to accept without probing the whole argument: Altruism is possible, but only culturally acquired altruism. How can that be if culture and biology are both products of blind variation and selective retention? What is painful for (some) people may be good for society and thus, presumably, good for people. But does that latter presumption hold, and what has pain got to do with altruism?

What has happened, it seems in retrospect, is that Campbell's address directed my thoughts down certain new pathways, and down those pathways I found the materials for this commentary:

1. "Altruism" is *thrice* ambiguous, here as elsewhere, so there are $2^3 = 8$ forms of it:

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WHO PROFITS?	AT WHAT LEVELS?	HOW DOES EGO SUFFER?
1. Other organism(s)	Kin or local group	Biologically (loss of fitness)
2. Other organism(s)	Kin or local group	Psychologically (pain)
3. Other organism(s)	Urban society	Biologically
4. Other organism(s)	Urban society	Psychologically
5. The social order	Kin or local group	Biologically
6. The social order	Kin or local group	Psychologically
7. The social order	Urban society	Biologically
8. The social order	Urban society	Psychologically

For reasons which I hope will become clear I end up using "altruism" for forms 7 and 8 only, distinguishing between them with the appropriate modifiers where necessary.

2. The mode of replication (acquisition, transmission) and evolution of a behavioral propensity (hereafter, "instruction") must be distinguished terminologically from the results of the behavior: The behavior of a "biologically" (genetically) replicated and evolved instruction may have either a "biological" (organismic) or social outcome, or both, and the same is true for the behavior of a "socially" (culturally) replicated and evolved instruction. Again, I hope, the necessity for these distinctions will become clear.

I do not think the following is really a proper "criticism" of Campbell's address; it is, rather, a "building upon" his address. If I come to conclusions somewhat different from his, that is only to be expected.

A prefatory note: "Instruction" is a central term in what follows. An instruction is what Campbell calls the "anatomical and physiological embodiment" of a "behavior tendency" or "behavioral disposition"; it is an element of a "recipe for living" stored in an individual organism—mainly in his nervous system.[2] Instructions are acquired by the organism by gene action and/or by observational learning and other cultural processes;[3] thus they are replicated and hence subject to natural selection (which I take to include the activity of such vicarious selectors as reinforcement and extinction).[4]

COST AND BENEFITS

Whether or not a behavior becomes common in a certain region depends upon its material consequences in that region. Its consequences may be beneficial (+) or costly (—) or neutral (0) to any or all (or none) of the following things:

—the *instruction* which embodies it and determines its precise form; (I)

—the organism which, *carrying* and enacting that instruction, exhibits it (fitness in the narrow sense); (C)

—other *organisms,* generally of the same species as the carrier; *(O)*
—the mechanisms of cohesion of a small local *group* of such organisms; *(G)*
—the mechanisms of social order in a large *urban* society. *(U)*

The behavior benefits one of these things—is $I+$, C+, $0+$, $G+$, or $U+$—*if* it promotes that thing's survival and/or reproduction; in general, if it helps bring about further occurrences of that thing. Conversely, it is costly to a thing—is I—, C—, 0—, G—, or $U--$*if* it has the opposite effect on that thing.

When, for example, I say a behavior benefits its instruction's carrier, that it is C+, I mean that in terms of the carrier's survival and/or reproduction—not that he has some descendants, or that he has more descendants than some carrier of some other instruction, but that he has more descendants than he would have had had that instruction, carried by him, not behaved. Similarly, when I say a behavior benefits its instruction, I mean only that as a result of it the instruction occurs in more subsequent locations than it would have occurred in had it not behaved.

The costs and benefits to the various things are not independent; on the contrary, they are often causally intertwined. Thus a behavior's consequences could be on balance, for example, *"1+ because C +"* or *"I— because C— because G—"* or *"I+ because 0+ although C—."* Furthermore, there are degrees of cost and benefit; in that last example, the behavior's consequences no doubt would be more I+ if they were less C—. Henceforth, however, we will usually ignore degrees and treat only of + and —.

Theoretically, the only condition among these necessary for a behavior becoming common in a region is that its consequences there be, on balance, at least slightly *I+*. The relation between an instruction and its behavior is so close, in fact, that from here on I will refer to instructions', rather than to behaviors', being $/ +$, $G+$, 0—, etc. An instruction occurs frequently (is successful), and is therefore socially important and scientifically interesting, only if it is *1+,* that is, beneficial to itself, over the medium-long run.

It is a universal brute fact of nature, however, that if an instruction that is replicated genetically is to be $/+$ it must be C+, or if it is C— it must be $0+$ under such conditions that 0 is a carrier, too. This situation is most likely when C and 0 are close kin or are comembers of a small local group.

Since it is also a brute fact of nature that human beings usually rear and enculturate their own children, successful, culturally replicated *I+* instructions, too, are usually C+ *("I+ because C+")* and/or $0+$ in a small group environment *("1+ because $0+$ and C+"* or *"1+ because $0+$ although C—").*

One way in which an instruction can be $O+$ (or C+, for that matter) in a small group situation is by being $G+$, that is, by promoting the cohesion of the group: *"I+ because $O+$ because $G+$," "I+ because C+ because $G+$."*

So we must expand Campbell's view a bit: While it is true that $I+$ genetically programmed instructions are generally "selfish" (in fact if not in theory), that is, C+, it is also true that $I+$ culturally programmed instructions are generally $C+$ and that both genetic and cultural instructions are sometimes *"I+ because $O+$ although C—"* or *"I+ because $O+$ because $G+$ although C—"* (or, of course, *"I+ because C+ because $G+$").*

Finally, we must recognize the fact, which Campbell seems to assume and depend upon, though he never makes it explicit, that some cultural instructions may be *"I+ although C— and $O—$ and $G—$."* This reflects the fact that a cultural instruction can be replicated interorganismically within a matter of hours (perhaps minutes) of being acquired, so its being I+ does not in principle require that the carrying organism survive after that, let alone reproduce (just as a genetic instruction's being $I+$ does not in principle require that its carrier survive after the reproductive portion of his/her life). An *"I+ although C— and $O—$ and $G—$"* cultural instruction, then, can be a complete parasite, for example, an instruction to smoke tobacco, drink too much alcohol, shoot heroin, or believe advertising. On the other hand, Campbell's general conclusions seem to presume that some cultural instructions are biologically altruistic: *"I+ because $U+$ although C—."*[5] He has to presume that in order to maintain the distinction between always-selfish genetic instructions and sometimes-"altruistic"-at-the-urban-level cultural instructions.

Theoretically, such an instruction could be *"I+ because $O+$ because $U+$ although C—,"* where O is also a carrier; in other words, the behavior of the instruction benefits the urban social order which benefits another organism carrying the "same" instruction and thus benefits the instruction whether genetic or cultural. Practically, however, it cannot work (except to supplement other mechanisms after the instruction is widespread) because if the benefiting O is not usually a member of C's kin or local group (and that is implied by $U+$ rather than $G+$) then "cheating (failing to acquire or failing to exhibit the behavior of the $O+$ $U+$ C— instruction) pays"; that is, in an urban society/environment the $O+$ $U+$ $C—$ instruction is actually, on balance, not *"I+ because $O+$ because $U+$ although $C—$"* but rather *"I— because $C—$."* Again, however, this holds for cultural as well as genetic instructions; instructions of neither kind will be *"I+ because $O+$ because $U+$ although $C—$."* In short, no instruction which

achieves success by benefiting the mechanisms of urban social order does so through benefiting its carrier's fellow humans.

Having established that, I will redefine C, adopting a modified version of W. D. Hamilton's concept of "inclusive fitness."[6] Now C will refer to the inclusive fitness of the carrier; if an instruction is $"I+$ because $O+$ (because $G+$) although C—," it now becomes, under this concept, a special case of $"I+$ because C+" (and hence it becomes C +). Likewise, an instruction will be called C— only if its inclusive fitness is negative, that is, if it is neither C+ nor $"I+$ because $O+$ (because $G+$) although C —." In other words, all instructions that are $1+$ because they benefit the carrier or his local or kin group and/or its members are henceforward C+; only others are C—.

How A C⁻ INSTRUCTION CAN BE SUCCESSFUL

Well, then, how can there be successful, biologically altruistic ("1+ because $U+$ although C—") cultural instructions? Let us look at the case of 1+ although C —" instructions in general. One feature which I suspect is common to many, if not all, $"I+$ although $C—"$ instructions is that their behavior or its consequence brings pleasure to the carrier-enactor; in other words, the instruction exploits the organism via its own vicarious selection mechanisms.' It fools those mechanisms, which, of course, originally evolved because they were C+

To explicate more fully, I now introduce another letter to our alphabet of behavioral outcomes: *L.* An instruction is $L+$ if its consequences are such that it is retained and/or propagated in an individual's brain by the vicarious selection mechanisms, the *learning* mechanisms, that he already carries; it is L if it is rejected or erased by those mechanisms. The learning mechanisms are themselves products of instructions acquired by the organism genetically and culturally. In general, the behavioral consequences of L+ instructions are experienced as "pleasurable," those of L— instructions as "painful," in varying degrees.[8]

We must note here that the vicarious selection mechanisms are not omnipotent. An instruction, genetic or cultural, that is L — (and whose behavioral consequences are quite painful) may still be $1+$ because, for example, it is C+; otherwise, many people would never get out of bed in the morning, and more courageous actions would be impossible. Likewise, an instruction that is (or would be) $L+$ may never be acquired by most organisms in a population because it is $"I—$ because (say) C—"—it has never become part of the genetic or cultural heritage of that population.

But some instructions apparently are "1+ because L+ although

C—"; these instructions, which must be culturally and not genetically replicated, persist through generation after generation by exploiting, as I said, the vicarious selection (learning) mechanisms and, through them, the individual carriers. To illustrate: I have a "bad habit," a $C— L+$ instruction. You, my neighbor, have more children than I do because you do not have this bad habit. But some or all of your children acquire this bad habit by observational learning from me and my children and retain it because it is $L+$. They in turn propagate it, and so forth, until the $C— L+$ instruction becomes, and remains, widespread in the population: "$I+$ because $L+$ although $C—$."

EGOISM AND ALTRUISM

The discussion so far suggests that there are two kinds of altruism and two kinds of egoism, and they do not necessarily go together at all:

An instruction is biologically egoistic if it is C+.
An instruction is psychologically egoistic if it is $L+$.
An instruction is biologically altruistic if it is C— and $U+$.
An instruction is psychologically altruistic if it is $L—$ and $U+$.

Altruism, in other words, requires that the instruction's behavior's consequences be both (1) painful and/or costly to the carrier and (2) beneficial to the urban social order. Table 1 lists the four combinations of valences of C and L for both kinds of instructions, telling

TABLE I

COMBINATIONS OF CHARACTERISTICS OF INSTRUCTIONS WHICH CAN ("YES") AND
CANNOT ("NO") BE 1+ AND THUS PROPAGATE IN A CERTAIN REGION

CONSEQUENCES OF BEHAVIOR IN THAT REGION ARE	REPLICATION PROCESS		REMARKS
	Genetic	Cultural	
$C+$ and $L+:$ "$I+$ because $C+$ and L+	Yes	Yes	Psychologically and biologically egoistic; the most common combination by far; unproblematical
$C+$ and $L—:$ "$1+$ because $C+$ although $L—$"	Yes	Yes	Biologically egoistic; psychologically altruistic if $U+$
$C—$ and $L+:$ "$1+$ because $L+$ although $C—$"		Yes	Psychologically egoistic; biologically altruistic if $U+$
$C—$ and $L—:$"$I+$ although $C--$ and $L—$"			Both biologically and psychologically altruistic if $U+$

whether each of the eight resultants can or cannot be 1+, according to the discussion so far.

ENVIRONMENTALLY ENGENDERED PSEUDOALTRUISM

Our concern now is with the processes that favor the evolution of an urban social order; in other words, that make $U+$ instructions 1+. I will deal shortly with the problems of altruistic instructions *(U+* and C— or *L—).* But one way an instruction, $U+$ or not, can be /+ is, of course, for it to be or become C+ or $L+$. So first let uslook at one special process whereby the C or L valence of an instruction *(U+* or not) can be changed.

One way for a C — or *L—* instruction to become C+ or $L+$ is for its structure, and hence its behavior, to change; in other words, for it to be replaced by a different instruction. But another way is for its environment to change, thereby changing one or more of its ultimate behavioral outcomes. In particular, its environment may be changed by the action of another instruction following which the two instructions enter into, and remain in, a special relationship. I will call the process and the relationship "Environmentally Engendered Pseudoaltruism," or EEPA for short. Here is a simple example to show how EEPA works:[9]

   1. Instruction Y—for me to give you food I have just gathered—is "I-because C— and/or *L —,"* so I do not carry it (either I do not acquire it or I do not retain it if I do acquire it).
   2. You acquire instruction X—for you to bite me really hard if I do not give you some of my food.
   3. At the time you acquire it, instruction X is, at least slightly, "/— because C— and/or *L—."*
   4. Incidents of the following sort occur: I do not give you food and you, enacting X, therefore bite me.
   5. I acquire instruction Y. Enacting it, I give you food and therefore do not get bitten; Y is now *"I+* because C+ and/or *L+,"* so I retain Y.
   6. Having retained Y, I continue to give you food regularly; X is now therefore "/+ because C+ and/or *L +,"* so you retain *X.*
   7. And so on.

The EEPA relationship is an enduring one; it is both interinstructional and interorganismal, and it occurs in several forms, from the crude form just given to forms of remarkable complexity and delicacy:

1. The instructions involved can be both cultural or both genetic or one of either, or one or both can be compounded of genetic and cultural elementary instructions (provided that no genetic instruction becomes, on balance, C—).

2. As illustrated above, the process was strictly in the here and now, occurring between adults. Presumably, the changes in the valences of L were the principal determinants of the changes in the valences of $I;$ indeed, the valences of C need not have changed for either instruction. We could call what you and instruction X did to me and instruction Y "exploitation by training," which suggests that the training could be in or out of awareness of the trained (or, indeed, of the trainer). It could be incorporated, in other words, into the process of rearing the young.

3. But the process can take place just as well over evolutionary time, cultural or genetic. Then the changes in the valences of C are determinative of those of I: Carriers of X and Y thereby survive and pass their genes and their cultural instructions, including X and Y, on down their respective family lines. In that case, we call what your family line and instruction X does to my family line and instruction Y "exploitation by domestication."

4. There is an exactly similar process operating in the case where at the outset I (or my family line) carry instruction $Z,$ to withhold food from you, because it is $"I+$ because $C+$ and/or $L+."$ You (or your line) acquire instruction $X,$ as before. Now Z becomes $"I—$ because $C—$ and/or $L—"$ and is lost or changed. Again, you or your line and X have trained me and Z or domesticated my line and $Z.$

5. The behavioral outcome of X may be much less drastic to the organism enacting Z or not enacting Y than in the example; he/she simply may be denounced verbally or shunned, etc.

6. The behavioral outcome of X may be rewarding or beneficial to the organism enacting Y or not enacting Z rather than punishing or costly to the Z-enactor or non-Y-enactor. The resulting relationship is the same: domestication or training, by X and its carrier, of Y or Z and its carrier.

7. The modes can be mixed; X could be retained by a family line through the evolutionary process and Y retained in organisms each generation by learning, or even vice versa. And, if both are retained through the evolutionary process, one could be genetic and the other cultural. Or there might be elements of learning and cultural and genetic evolution in either $X,$ or Y, or both.

8. Being products of instruction action, the learning mechanisms are themselves subject to evolution and thus to domestication. After a hundred generations or so it might give members of my group nothing but the greatest pleasure to share our food with members of your group. Instruction X actually might be expressed behaviorally so seldom as to be practically forgotten. This might be the most effective kind of interorganismal exploitation of all.

9. Both X and Y may be carried by the same organisms: Just as I share my food with you, you share with me; just as you punish me for not doing so, or reward me for doing so, I punish or reward you. Again, X may hardly ever actually behave. All of us—you or your line, me or my line, and Y—are trained or domesticated by X. Here the EEPA process is a reciprocal one; sociologists call the resulting relationship "social control."

10.. Carried by me, X may set up the environment for Y in me; without any overt gross behavior at all, but through neural means alone, X punishes me for not doing Y or for doing Z or perhaps even for "wanting" to do Z or not wanting to do Y. (Or it rewards me for the opposite behaviors or wants.)

In such a case, X ends up $"1+$ because C+ although $L—$ (because it punishes)"; and Y ends up $"I+$ because $L+$ (because it avoids punishment) although C —" or Z ends up $"l—$ because $L—$ (because it attracts punishment)." The EEPA process, in this case, is still interinstructional, but now it is intraorganismal. Under normal circumstances X seldom or never has to behave, even neurally; Y is well established in my nervous system, or Z is thoroughly repressed (or modified or even extinguished); I am a happy "self-controlled" food sharer.

ON THE HOSTILITY OF PSYCHOLOGY AND PSYCHIATRY TO TRADITIONAL RESTRAINTS

Now we can deal with part of one of Campbell's main points. Suppose, in a case like that in item 10 above, my instruction Z is not thoroughly repressed or modified; I really do not want to share my food, or I even actually refuse to share it. This could happen for either of two reasons (among others), producing cases of the following,two types:

1. I never acquired instruction X, or, at any rate, it does not operate frequently enough in me. I am a selfish hedonist, happily keeping and eating all I find, until or unless I get caught and punished by my X-carrying neighbor(s). For me Z is $L+,$ but I am a "social problem" because Z is also presumably $U—$.

2. I am carrying a perfectly functioning X. Even so, Z is still L+ for me, at least to the extent of making me want not to share my food even if I actually do share. The reason for this might lie in early childhood experience where Z behavior was rewarded, or non-Z behavior punished, to an extent far beyond the normal range; or in some other unusual circumstance or in some defect in my learning mechanism. So I keep doing or wanting to do $Z,$ and X keeps punishing me unmercifully (and I cannot even run away), and eventually I may consult a therapist.

Campbell is telling us, I think, that (a) at least until recently, psychologists and psychiatrists have been seeing a disproportionate number of people of type 2; *(b)* Z is acquired genetically, as a rule (it therefore must be $C+$; but I am not sure that is germane); *(c)* X is acquired culturally as a rule; it may be $U+$ (ordinarily, it will be $U+$ if Z *is* $U-$); *(d)* the clinicians observe, correctly, that X is a determinant of the type 2 patient's distress and find that by exorcising X they reduce or end his distress; *(e)* they therefore generalize that *X,* and other culturally acquired X-like instructions, should be eliminated from childhood enculturation and socialization and from the formal and informal education of children; *(f)* but in the vast majority of cases people are neither type 1 nor type 2. The Z-like instruction, whether acquired genetically or culturally, is effectively suppressed by the X-like instruction. In many cases, perhaps most cases, the EEPA process has been evolutionary—the individual never even acquires *Z;* in the others, the EEPA process occurs early enough in ontogeny that the individual "never feels the slightest urge" to do *Z,* even though he carries it; (g) eliminating X-like instructions from the cultural tradition, therefore, would turn not only type 2 cases but also many "normal" people into type 1 cases—selfish hedonists, social problems —leading perhaps to a serious breakdown in the urban social order.

In summary, Campbell is telling us an X-like instruction may be necessary for civil society *(U+),* and we should not seek to throw it out, without carefully considering the consequences of doing so, just because it makes some people sick.

He is also telling us that the above considerations arise from an inherent conflict of altruistic "human culture contra selfish human nature"—the "original sin" idea. Since instruction Z can be just as easily cultural as genetic, however, and since instruction X may well be biologically or psychologically egoistic or both (and is, in the examples he cites),[1°] I do not think that formulation holds up under analysis.

How AN INSTRUCTION CAN BE SUCCESSFUL BECAUSE $U+$

I have just explicated a process by which a $U+$ instruction (or other instruction) may become $I+$; to wit, by becoming $C+$ or $L+$ through the EEPA process. The first question we raise now is, Why should such an instruction be $U+$? In other words, under what circumstances is a $U+$ instruction rather than a $U-$ or UO *("U* neutral") instruction likely to become $I+$ through the EEPA process? We also wonder if a $U+$ instruction can become $I+$ without being $C+$ or $L+$; in other words, whether a completely altruistic instruction can succeed.

The second question is, Given that a successful instruction is $U+$,

how can we decide whether it is a good thing? I will come back to that question in the next section.

Starting on the first question, we eliminate the cases where an instruction is *"I+* because C+" or *"I+* because *L+"* and just happens by coincidence to be *U+.* Such cases may occur, but they are unlikely because being *U+* is bound to be expensive; besides, they are of no further interest to us since we have already given them all the explanation possible. The instructions we want to look for, then, are *"I+* because *U+";* they may be *"I+* because C+ because *U+"* or *"I+* because *L+* because *U+"* in which cases they may be psychologically altruistic or biologically altruistic, respectively. We do not know yet if an instruction can be altruistic both psychologically and biologically, that is, *"I+* because *U+* although *C—* and *L—."*

An urban society (or any other complicated ecosystem) at a given moment is the product of a highly complex interaction between (1) a set W of *U+* instructions that act cooperatively to maintain it and (2) the "raw environment" of set W. The raw environment is what would be present at the location of the urban society if the instructions of set W all suddenly stopped behaving. Besides stalled vehicles and crumbling buildings, etc., one would find stalled people and crumbled social relationships; most instructions for survival skills and local and kin group life having become extinct generations ago, the human part of the raw environment would consist initially of people wandering about aimlessly or remaining still and staring about them. Even the looting of food stores would be so unsystematic as to seem purposeless, a product of trial-and-error learning. Much food would spoil before being eaten.

Without the attention of carriers of W instructions, food crops would wither and die and domestic animals starve, and, of course, none would be replaced. Useful wild animals and plants would not grow right away on the ruined land. (Even if the preurban instructions had survived, there would be far too few of the proper resources and far too many people for them to save more than a tiny fraction.) If the people knew enough to make fires, they would use up all the fuel before the worst of the first winter was over and would have no way to get more. Because of the combination of crowding and lack of sanitary services and habits, epidemic diseases would sweep through the population.

In summary, the combination of environmental degradation and cultural impoverishment would result in all the people dying or wandering off. The region of raw environment would soon become a cultural and biological wasteland, unfit for habitation by humans or

their genetic or cultural instructions. It would be some years before it recovered biologically to the level where a people with a well-developed hunting-and-gathering culture would be able to incorporate it into their home range.

That wasteland, then, is the raw environment which the $U+$ instructions of set W enable us to inhabit today. But observe: That wasteland is also the product of those same W instructions operating yesterday. If we bless our $U+$ instructions and their products for enabling us to live in a wasteland, we must also curse them for creating that wasteland and making us live there in the first place.

Reciprocally, today's W instructions are in a sense a product of yesterday's raw environment. They are $"I+$ because $U+,"$ but only in that environment, because they convert that raw environment into an urban society, an environment habitable by human genetic and cultural instructions, including of course themselves. In that urban society/environment each organism and each individual instruction, whether of set W or not, behaves and as a result is or is not replicated (i.e., is or becomes $I+$ or $I—).$ For instance, an instruction that would be $"I+$ because $C+"$ in the raw environment might counteract in the urban society the effects of one or more $U+$ instructions and thus be $"I—$ because $C—$ and/or $L—"$ in that environment. As an extreme example, in the raw environment it might pay to use a small rectangular piece of green paper to start a fire; in an urban society (raw environment and W instructions interacting) to do so would destroy a means of obtaining food or other necessities.

In the urban society/environment the W instructions have a certain absolute frequency; there are so many of each occupying a given region of space over a given period of time, a certain distribution with a certain spatiotemporal density. That frequency also has a temporal trajectory: Given the set of instructions making it up, the existing W set is increasing or decreasing in frequency at a certain rate. If increasing, it is taking over adjacent territory or filling in spaces inside its present territory or becoming carried by more existing organisms or increasing the number of organisms which carry it, etc. If decreasing, it is doing the opposite.

Now suppose a novel instruction appears somewhere in the urban society/environment. It might be $U+,$ or $U—,$ or UO (neutral with respect to $U).$ If it is UO or nearly so, it might still be $I+,$ propagating through the present W territory as a passive parasite (like "silent" DNA) or because it is $C+$ or $L+.$

If the new instruction is I', a $U+$ instruction, it not only will be propagated throughout the W territory (the urban society/environment) but also will modify the environment in such a

way as to increase the frequency (relative to present change rates) of the W instructions; metaphorically or literally, it will expand the territory occupied by set W. And, of course, Y will share in that increase, propagating into the new locations along with the W instructions.

So, to that extent, a $U+$ instruction has a selective advantage over a UO instruction in an urban society/environment.

If the novel instruction is *Z,* a *U—* instruction, it could propagate, of course, throughout the present W territory passively or by being *"1+ because C+* or *L—,"* modifying the environment in such a way as to decrease the frequency (relative to present change rates) of the W instructions. As it did so, it surely would be damaging its own habitat because it would be making the environment more like the raw environment. Thus, in the medium-long run, it would not achieve the frequency that a $U+$ or UO instruction would have achieved or that it would have eventually achieved had it not behaved. Nevertheless, such propagation can happen and, I think, has happened; all civilizations have declined, at least some from "internal decay"; certainly, some of those have declined at least in part because they adopted "antisocial" *(U—)* instructions or sets thereof.

But I think that there is a good probability that the EEPA process will intervene in such a case. At any point in the process of disintegration an instruction *X* which, responding to some result of Z's behavior, slows or halts the propagation of *Z* may emerge and propagate through the W territory. Thereby *X* may make Z become /—; once its progress is halted, *Z* may sooner or later make itself extinct by damaging its habitat. (In the process it also will destroy the W instructions there; but other W instructions are waiting nearby to replicate into that area.) In any case, whether Z is destroyed or its progress merely slowed down, *X,* through its behavior, occurs over the medium-long run in places where it would not occur if it had not behaved, and thus X is *1+;* furthermore, it is *"I+* because *U+"—it* has increased its frequency by increasing the frequency of the $U+$ W instructions by helping to preserve the urban society/environment in which it, and they, can exist.

The means by which *X* can accomplish this are many and varied. It may operate on the organisms that enact or exhibit *Z* behavior, resulting in anything from their physical destruction (making Z *"I—* because *C—")* to public shame or bad guilt feelings on their part (making Z merely *"I—* because *L—").* Or it may operate socially, isolating carriers of Z and so preventing them from begetting or bearing or enculturating other people's children. If it is not so specifically anti-Z but directed against innovative or nonconformist behavior in general, it will have its effect and thus be *"1+* because *U+"* in the presence of

many different *U—* instructions." Once such an instruction *X* is propagated in the urban society/environment, many Z-like *U-* instructions cannot even get started.

An instruction *X* that modifies the learning apparatus to make defending the existing social order pleasurable thereby renders a large number of *U+* instructions *L+* and thus makes itself *"1+* because *U+."* It becomes a sort of general purpose status quo defender.

To summarize our discussion of the first question, Why should an *1+* instruction be *U+?:* A complex urban society, like any elaborate ecosystem, is not guaranteed against destruction or drastic reordering; but a novel *U—* instruction that would do so has the handicap that the more *U—* it is (i.e., the more it interferes with the urban social. order), the more it changes conditions to approach those in which, thanks to earlier behaviors of the *U+* instructions of set W, no human instructions, including itself, can survive. Conversely, the more *U+* an instruction is (i.e., the more it benefits the social order), the more it helps make places in the raw environment for itself. One way in which it can do so, in fact, is to oppose specifically the propagation of *U—* instructions. Thus the odds seem to favor the evolution of instructions that support and expand the present social order, whatever it is, and protect it from other instructions that would damage it. For an instruction, going along with the existing order usually pays; challenging it does not pay. The whole existing set W is, in effect, one big instruction *X* in the EEPA process.[12] And thus yesterday's W-set not only built yesterday's society but perpetuates itself to build today's.

Before we pass on to the second question, I want to make four final points:

1. What I have just illustrated is an episode in the evolution of an urban society/environment (or, indeed, of any ecosystem) and of the instructions which, by their behaviors, construct it. In other words, Xand/or Y become part of set W as the episode ends. The longer the society lasts, the more X-like and Y-like instructions will be part of set W, and the more complex, powerful, and resilient the social order is likely to be.

2. Each time an X-like or Y-like instruction is adopted into the W set, realignment of the relationship among instructions may take place. In particular, one or two instructions which were successful *(1+)* before may become Z-like and suffer the same fate as a novel Z-like instruction. In paleolithic times instructions whose behavior brought "paleolithic satisfactions" (see next section) to their carrier, and thus were *"1+* because *L+,"* were also sure to be *"1+* because *C+"* since the "paleolithic satisfactions" had evolved previously as a mechanism of vicarious selection. As the urban society evolves, such

paleolithic satisfaction—bringing instructions will not necessarily continue thereby to be C+ or *I+* (assuming, of course, that they do continue to bring paleolithic satisfactions in the urban society/environment); indeed, they well may become *"I—* because *U—"* or *"I—* because C— because *U—."* For example, instructions to share one's possessions with kin and local group members—"I+ because C+ because *G+"* and satisfaction-bringing in a tribal society—prevent individual accumulation of capital goods. If and as an urban society evolves toward a capitalistic economy, those instructions become *"I—* because C—"; it is the stingy savers that get children.

3. Any of the *I+* instructions discussed, not only *Z* but also W, Y, and/or *X,* could be genetic as well as cultural, provided only that they were not, on balance, *C—.* This statement very definitely contravenes Campbell's second "fact . . . , relatively uncontroversial," that human sociality *"cannot* have been achieved on a genetic basis . . . *because . . .* there is genetic competition among the cooperators."[13] On the contrary, the urban social order has got the humans in an environment where they compete with one another, genetically and culturally, to be the best "cooperator" (in the schoolmarm's sense, perhaps) with it. The fact that all known *X* and Y instructions in humans apparently are replicated culturally may be due simply to the fact that human genetic generations are long, and we have had urban societies for only a very short time; we simply have not had time to evolve genetically acquired *U+* instructions.

4. It now appears that *X* (if cultural) can be *"1+* because *U+* although C — and *L—"—an* instruction that is successful although altruistic both biologically and psychologically. Even though its behavioral result both causes discomfort to its enactors and reduces their inclusive fitness," it succeeds by helping maintain the frequency of the (other) W instructions which in turn maintain its frequency in the raw environment they created yesterday. If that is true, the EEPA process has transcended itself, its "altruism" is no longer "pseudo": Instead of one egoistic instruction training or domesticating another, we find a truly altruistic cultural instruction training or domesticating an egoistic instruction and its carriers in, and for the sake of, urban society.

WHAT PRICE SOCIAL ORDER?

Our second question was, Given that a successful (*1+)* instruction is *U+* (which generally entails, we now understand, that it is *"I+* because U+"), how can we then decide whether it is a good thing for people?

Like Campbell, we are especially interested in asking that question

about biologically altruistic instructions—those which are *"I+* because *U+* although C --."* I have shown above that *U+* instructions cannot, as a rule, be *O+*. We must conclude, then, that the decision cannot be made on the basis of the instruction's contribution to somebody's fitness. (Furthermore, I shall show in this section that an instruction which is *"1+* because C+ because *U+"* is not necessarily good for people anyhow.)

As we approach this question we observe, first, that "urban social order" is not a simple, one-dimensional character: There are many possible forms of urban social order, many possible urban society/ environments, many possible sets W of *"I+* because *U+"* instructions. Given a certain density of population and certain values of other environmental variables, an urban social order of some form is necessary, but some forms may be far better than others.

We observe, second, that the member instructions of any particular set W vary in their outcomes and in the impact of their behaviors upon people. This fact raises the possibility that in a given urban society some W instructions may be good for people, others bad.

We observe, third, that all W instructions, all *U+* instructions, are either domesticators or domesticates, trainers or trained. As such, they are parts of a system which trains and domesticates the people; and training and domestication are means of exploitation—if not of humans by humans, of humans by instructions. Is all exploitation bad? If it is, of course, all sets W and all urban social orders are bad. Or is the goodness or badness of an exploiting system relative to, say, the values of some of its other outcomes?

We observe, fourth, that we cannot base a standard of value for human life on fitness. A *C+* instruction may simply produce more people to live in misery—and even contribute to their misery (perhaps for the very reason that it produces more of them). This unwanted consequence can occur in the short run or the medium-long run. Nor can we base a standard on a general hedonism; a particular *L+* instruction may reward some people today only to bring misery to them or others tomorrow or next year. The question becomes, then, which of our reward systems, our vicarious selection mechanisms that make certain instructions *L+,* can we trust?

The best way to look for basic human values, I think, is to ask what outcomes have been satisfying to humans over the long run—say, after one million or two million years of genetic and cultural evolution but before the dramatic changes in behaviors and wants that have occurred, suddenly, over the last ten thousand years. To provide a touchstone, a baseline for comparison, I am going to assume that life for our hunting and gathering ancestors in paleolithic times was idyl-

lic. Human beings evolved genetically and culturally for that kind of life; I am presuming that we evolved to find satisfaction and joy in it, so it was truly our Garden of Eden. Recent studies provide empirical support for these assumptions." Because people lived in small groups and had no overt political organization, it seems reasonable to assume that there were few or no $U+$ instructions and thus no altruism in the sense we have been following here. People lived in mutualistic symbiosis with their culture rather than being domesticated by it.

I am suggesting that the root of our problems is to be found, in biblical terms, not in Original Sin but in the Fall: Our recent ancestors acquired and retained instructions to plant seeds and to tend animals; at first that must have seemed a fine supplement to hunting and gathering, but soon it brought about such an increase in population, and such other environmental changes, that people came to depend upon farming. Now only people who worked even when they were not hungry were fit, so instructions (vicarious selectors) that make work instructions $L+$ became C+; the work ethic became a new satisfaction. Similarly, only people who fought to defend their croplands and animals were fit, so instructions that make instructions for watching one's territory or for fighting with trespassers L+ became C+; rage at outsiders and pride of possession became new satisfactions. And so forth.

In other words, with the "neolithic revolution" culture began to take over. Environmental features resulting from the enactment of cultural instructions came more and more to dominate further human genetic and cultural evolution." The paleolithic genetic-and-cultural system was thus domesticated—modified to serve the neolithic and later the urban, cultural system, the W set. So here we are—culture's domesticates.

When I say "here we are," I am accepting the fact that there is no turning back to the paleolithic (as Campbell points out, to do so would reduce the human population to a small fraction of its present value).

To decide, then, whether an actual instruction or social order is a good or bad thing, or how good or bad it is, I would ask, To what extent does this instruction/social order help or hinder people in obtaining paleolithic satisfactions? To answer that, of course, would require a determination of just which of our satisfactions are paleolithic satisfactions and the development of a method of measuring them, which I am not going to essay here. (But they did not fear old age or natural death or discomfort or dirt, they liked dancing and telling stories, they loved their children, they shared their possessions, they did not claim exclusive rights in real estate, and they did not like

killing other people.) Therefore, I am not going to attempt actual evaluation of any given society or instruction. Instead, I will suggest a number of approaches to, or stances on, the question.

The *conservative stance* is that the situation now is the best we really can hope for. Any change brought about by deliberate action will interfere with the delicate balance of the society/ecosystem and only make things worse in the medium-long run. This view, I think, is based on the erroneous belief that the raw environment is the product of God and/or the evolution of the human genetic system ("human nature") and thus on resistance to the idea that tomorrow's raw environment (and thus the instructions that will be /+ tomorrow) can be made different from today's. From this false premise the conservative argues, correctly, that we very probably have today the "best" adaptation to that raw environment (or would have if the liberals had only left things alone yesterday).

The *liberal stance* is that if a present society has certain bad features it can be improved by changing the particular instructions that produce those bad features (see our second observation, above). Liberals vary in the specific techniques they would employ to produce instruction change. Some believe that preaching at people from some set of moral premises (with or without setting an example) can change behavior enough; some believe in preaching at people in what are conventionally taken to be positions in which one can effect change at "will." Some liberals believe that changing the laws will create an environment where good instructions will succeed and bad ones fail. The liberal view, I believe, is based on the assumption that the existing urban social order is essentially good. From that premise the liberal reasons, erroneously, that the bad instructions are not essential for the social order's continuance, that they are, in fact, antisocial *(U—).* (It is probably no accident that liberals, like conservatives, generally have experienced the social order as good.)

I think that when a liberal (and perhaps, too, a conservative) thinks of the kinds of behaviors that are essential to an urban social order he or she thinks of such things as impersonal courtesy, kindness to and cooperation with strangers, avoidance of violent response to frustration, respect for the civil liberties and property rights of others, veracity, and general obedience to laws and customs. All of these instructions/behaviors are, of course, quite foreign to hunters and gatherers, and to horticulturalists as well, but they have their analogues in the small local groups of those people, and they serve directly to bring paleolithic satisfactions to people in an urban society/environment. The antisocial behaviors the liberal is apt to

think of are rudeness, hostility, violence, hypocrisy and mendacity in high places, and larceny in places high and low. If, the liberal seems to believe, people in general and especially public officials had those private virtues, then urban social order would be what it is supposed to be; in short, we can have a good urban social order if only we can get people to behave urbanely and civilly.

The *anarchist stance* is, of course, that any urban social order is based on exploitation (which it is) and on interpersonal coercion and oppression (which it may be). Unlike the liberal, but like the conservative, he recognizes that all the W instructions are necessary for the maintenance of the existing social order, and these may include instructions for police brutality, prejudice and violence among different oppressed segments, control of public officials by powerful interest groups, selective enforcement of laws, military adventures in foreign parts, etc. The anarchist believes that the only way to avoid these bads is to do away with urban social order altogether and return all social control to something approximating paleolithic-sized groups. (Under such conditions, the local-group equivalents of the "civil" virtues, being $C+$, will come "automatically," by the way.)

The *radical stance,* which seems to me most consonant with the arguments presented in the previous sections, agrees with that of the anarchist as far as its conception of reality is concerned. It does not maintain, however, that urban social order is per se intolerable but rather holds that any given order should be examined to determine its overall effect on people occupying its various social positions and locations. Then the system should be analyzed to identify each W instruction, its distribution geographically and in the class structure, and its role in maintaining the urban society/environment; and to predict the short- or medium-run effects of removing or altering it.

It has been argued that any urban social order is per se "adaptive,"[17] that is, that it enables people to adapt to their environment (or, less euphemistically, that it adapts people to their environment). But, as I pointed out in the previous section, the raw environment to which the people must adapt is its own product—the result of previous behaviors of the "adaptive" W set. So I suggest that early in the evaluation of a given social order we construct a model of the raw environment, describing the conditions that would prevail in that region today if all the W instructions had quit behaving, say, a month ago. That is the environment in which the W instructions are adaptive today. Then we construct another model, of the "basic environment," the conditions that would prevail in that region today if the W set had never behaved (presumably a paleolithic or neolithic society/

environment). The difference between the raw and the basic environment is the "W environment"—that portion of the raw environment which is due to the actions of instructions of the W set. If we are dealing with a modern urban society, we will not have subtracted much; most of what is there, including, for example, most of the people, would not be there but for earlier actions of W instructions.

When we discuss the adaptive role of the W instructions, then, we can estimate how much of that adaptation is to the W environment, created by those very same instructions. That is a measure, it turns out, not of adaptation but of domestication—of the extent to which the evolving set W has made itself indispensable to us through the EEPA process by altering our environment until we cannot live unless we carry and enact it. We will find, I think, that few if any actions of W instructions are truly adaptive in the sense of enabling people to adapt to the basic environment.

Another step in the radical evaluation of a particular urban society is to compare it with Eden (or whatever baseline is being used)—to ascertain to what extent people are finding paleolithic satisfactions there. Then its degree of shortfall is compared with that of other urban societies, real or possible, and a judgment made. Given the costs and risks of change, and given the present and predicted trajectory and rate of evolutionary change," does this urban society, or does it not, provide enough paleolithic satisfaction to be acceptable? It is inherent in the radical view, as I see it, that the worth of every single W instruction contributing to that urban social order depends upon the answer to that question. If the society is acceptable, all W instructions are good; if it is unacceptable, all are bad.

So, contrary to the liberal, the radical does not believe that specific features of society, or the instructions that construct them, can be evaluated as if *in vacua;* all derive their value from the social order they help to build. Thus, to the radical, in a bad society $L+$ instructions are especially bad because they usually support the social order while providing only momentary pleasure to their enactors. Also, $C+$ instructions are bad because at best they simply insure the supply of domesticates. Even instructions which directly bring paleolithic satisfactions are bad because, keeping some of the people somewhat content some of the time, they contribute to everyone's dissatisfaction in the medium-long run. From the radical point of view, then, suggesting to the people that the $U+$ instructions making a bad social order are not all bad is like suggesting to an antelope that the genes making a lion are not all bad!" (And sometimes, in his darker moments, the radical suspects that, by some obscure route, even the instructions for being a radical may be $U+.$)

CONCLUSIONS

To summarize my conclusions in a form in which they can be compared with Campbell's: (1) Impulsive, self-gratifying instructions (acquired culturally or genetically) are not necessarily good. (Indeed, they may bring pain and/or reduce fitness and/or prevent receipt of paleolithic satisfactions in the medium-short or medium-long run, especially under modern, urban society conditions.) (2) Antihedonistic, antifitness, altruistic *("L— and C— although U+")* instructions may very well be important, even necessary, to the existing social order. (3) Such instructions should not be condemned merely because they cause some people considerable discomfort. (4) But in any urban society/environment all instructions which help maintain the social order must be evaluated in the light of an overall evaluation of the social order itself.

NOTES

1. Donald T. Campbell, "On the Conflicts between Biological and Social Evolution and between Psychology and Moral Tradition," in this issue.

2. Ibid.

3. Ibid.

4. F. T. Cloak, Jr., "Is a Cultural Ethology Possible?" *Human Ecology* 3 (1975): 161-82.

5. Most of the urban social order mechanisms of which Campbell writes involve kindness to strangers or refraining, at least, from damaging them; so at first glance it might seem truer to his formulation to phrase these presumed cultural instructions as I+ because *U+ because O+* although C —." If we keep in mind, however, that *"O+"* means *benefiting 0* in the narrow sense of promoting O's survival and/or reproduction, we see that being kind to another individual organism benefits the urban social order directly, not (primarily, at least) through benefiting the other individual.

6. W. D. Hamilton, "The Genetical Evolution of Social Behavior," J*ournal of Theoretical Biology* 7 (1964): 1-51 (reprinted in *Group Selection,* ed. G. C. Williams [Chicago: Aldine-Atherton, Inc., 1971], pp. 23-87).

7. Donald T. Campbell, "Blind Variation and Selective Retention in Creative Thought as in Other Knowledge Processes," *Psychological Review* 67 (1960): 380-400.

. My use of alphabetical symbols and of + and — here becomes somewhat inconsistent—L+, for example, does not mean that the instruction benefits a learning mechanism but rather that it is retained by that mechanism.

9. The idea of EEPA is derived, via Campbell (n. 1 above) and E. 0. Wilson *(Sociobiology: The New Synthesis* [Cambridge, Mass.: Harvard University Press, Belknap Press, 1975]), from R. L. Trivers, "The Evolution of Reciprocal Altruism," *Quarterly Review of Biology* 46 (1971): 35-57. In his theory of reciprocal altruism Trivers includes "moralistic aggression" (p. 49) as a reinforcing process for preexisting mutualistic behavior. What I have done here is reverse the temporal order of retention of the two features and generalize the process.

10. Campbell (n. 1 above).

11. Ibid. This case serves well to illustrate the difference between motivation and function. The *X* behavior is here motivated by a proconformist mechanism; it is cued by innovative, nonconformist behavior on the part of the *X* carrier or other organism. However, the function of *X* and its behavior—the outcome by which it gains its /+ evolutionary status—is the isolation, destruction, etc., of Z-like *U—* instructions. The

distinction between these two becomes manifest when *X* punishes some nonconformist behavior that happens to be *U*+. (If that happens too often, of course, as in a time of rapid social change, X's valence changes from "1+ because *U+*" to "I— because *U—.")*

12.   In such a context, I think, the EEPA process is thus a mechanism of what Campbell calls "downward causation"—an emergent entity (society or ecosystem, in this case) causing change at the microlevel (Donald T. Campbell, "'Downward Causation' in Hierarchically Organized Biological Systems," in *Studies in the Philosophy of Biology,* ed. Francisco J. Ayala and Theodosius Dobzhansky [London: Macmillan Co., 1974], pp. 179-86).

13.   Campbell (n. 1 above); emphasis added.

14.   Cities have always needed and had mechanisms for recruiting organisms from their hinterlands.

15.   See, e.g., R. B. Lee and I. DeVore, *Man the Hunter: The First Intensive Survey of* a *Single, Crucial Stage of Human Development—Man's Once Universal Hunting Way of Life* (Chicago: Aldine Publishing Co., 1968).

16.   This may well be a mere elaboration of Campbell's statement, "Adaptive evolution . .. works best when the evolving social organization is a small part of the total environment, so that variations in the social organization do not substantially change the selective system, that is, the overall environment" (n. 1 above).

17.   Ibid.

18.   Ibid.

19.   Note that this absolutist attitude is nonreciprocal. To the lion, some antelope genes are good and some are bad: The genes that make the antelope meaty are good and the genes that make it shy are bad. If he could, the lion would domesticate the antelope, encouraging the good genes and trying to eliminate the bad genes; and that is exactly what urban social orders do to us humans, genetically and (especially) culturally.