



## It's Not Every Day You Walk into a Laboratory Whose Mission Is to Save the World ...

... but when you do, you're in for a rude awakening. If the population keeps growing as it has been, our ability to think creatively may deteriorate drastically. And population control by itself is not an adequate solution. Staff editor • Nina Laserson • examines the research that prompted these conclusions, and the group of scientists behind it.

Building 112 of the National Institute of Mental Health in Rockville, Maryland, doesn't look like most government buildings. It's an unimposing metal prefab shell with its interior walls painted a rather unbureaucratic orchid color. The building doesn't smell like the standard government structure either—a large rodent population lends it a distinctive aura. The fact that the group housed in this building doesn't operate like the usual government team will become apparent. This group, the Unit for Research on Behavioral Systems (URBS) was organized by ecologist John B. Calhoun to study the behavior of animals in designed environments.

Calhoun and his six professional associates are engaged in a dramatic study of the forces affecting human behavior and social organization. The implications of their research are serious. They are convinced that we must begin to design our environment and thereby direct our evolution, or stagnation; and ultimately extinction of the human species becomes a likely prospect. This is not strictly a doomsday philosophy, for although misery and eventual doom constitute one option, corrective measures, involvement, and survival characterize another alternative.

Calhoun gives us about fifteen years to choose our course.

Evolutionary design ...

"Storming of the Bastille"

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Laserson on Calhoun

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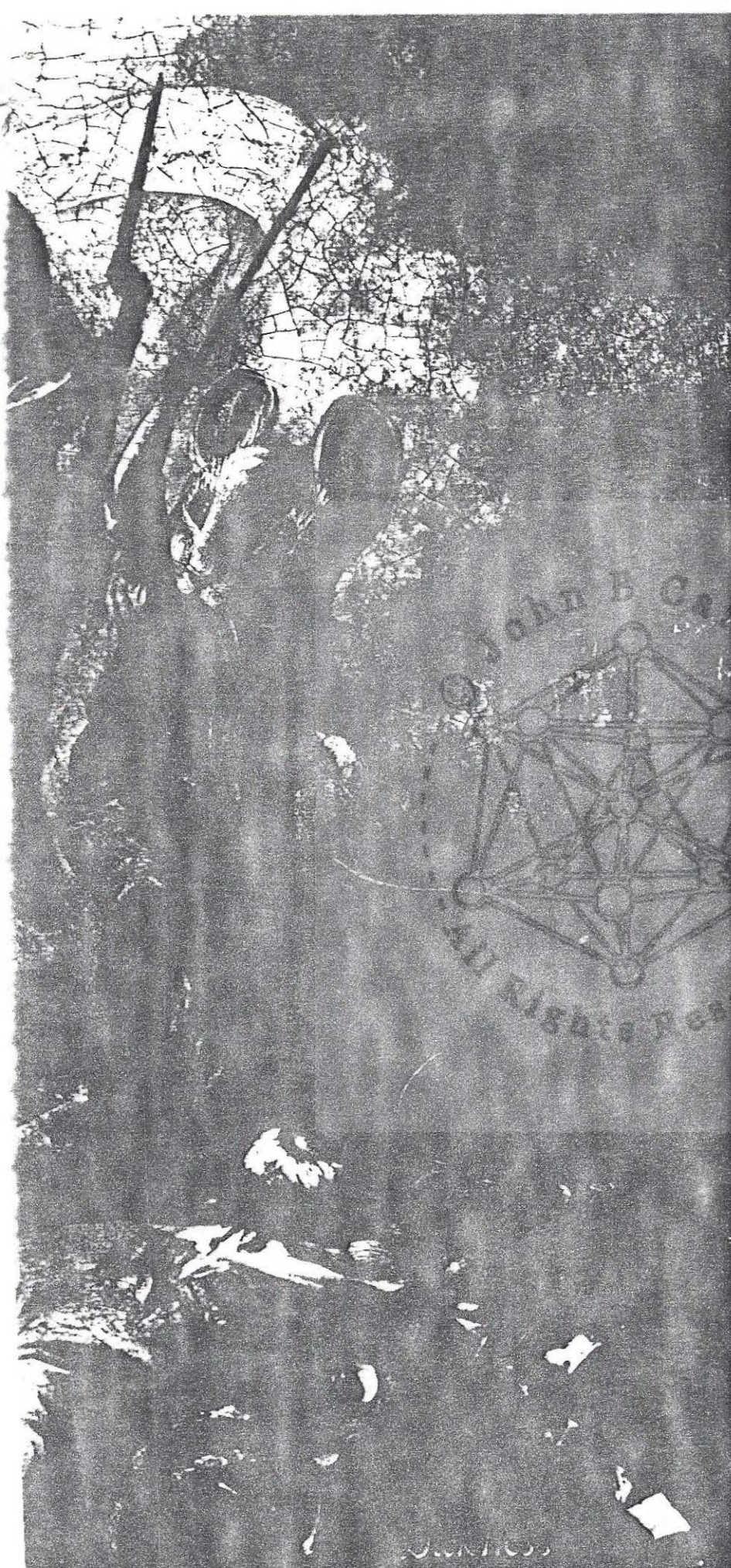
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**Evolutionary design**—symbolized by R<sub>x</sub>evolution—can save a species from the disastrous fate suggested by our updated version of this Delacroix.



1st column refers to Calhoun's Ecology and Sociology of the Norway Rat, 1963, 288 pp., U.S. Public Health Service Monograph 2008.

The story of John Calhoun's involvement with the rodent as a model for the human—the story of URBS—begins in Baltimore during World War II. Calhoun, having finished his doctorate in zoology at Northwestern University, joined a group studying the behavior of city rats at Johns Hopkins. Calhoun saw that despite ample food produced by poor sanitation, and despite much more living space than the rats could utilize, the city's rodent population did not grow. It became obvious that opportunity for social relations was a major limiting variable. Calhoun tried experiments in the city, acquiring his "subjects" by actually trapping the rats and marking them. Science was hampered, though, by people occasionally trying to help Calhoun: they would gather up the traps and kill the animals. After all, the only good rat is a dead rat.

Calhoun had some property behind his house, and he asked the owner whether he could put up some rat cages there. On his first trip back to this property, the owner was surprised to find a quarter-acre pen with a tower—the first simulated rat universe aimed at approximating the rats' city life. The environment didn't look the same but the spatial factors were similar. There were bundles of food, and the rats began to move about in little structured groups, as they do when "free."

Anthropologist Edward T. Hall has commented that Calhoun was one of the first people to investigate animals under normal circumstances, and then to transfer his investigation to the laboratory while retaining the complexity and validity of the natural situation. In his partially controlled universe, Calhoun could follow the rat society in detail, knowing each subject throughout its life. He was able to observe the population without disturbing it, and to study the social dynamics operating within the system.

This experimental situation was less than ideal, since the outdoor conditions inhibited control, and the animals could not be protected from the weather, predators, and disease. But Calhoun's work did draw the attention of many official visitors who thought that the work was important and should receive governmental support. The support, though, was not forthcoming. Calhoun's research would be expensive, and, besides, it wasn't the type of program that the government likes to give money to. It was too complicated. The experimental design was inadequate. There weren't any visible parameters.

After two years on a special fellowship at Roscoe B. Jackson Memorial Laboratory in Bar Harbor, Maine, Calhoun tried to get into NIMH. At that time, it was felt that he didn't

quite fit in, since his research would be properly classified as psychology, but he was not formally trained in this area. Three years with neuropsychiatry at Walter Reed Army Institute of Medical Research under "patron" Dr. David Rioch ensued.

Calhoun had to leave Walter Reed during the heyday of Joe McCarthy, since the mood of the time suggested that the Army should not be tampering with anything as volatile as "population research."

In 1955, Calhoun was taken on by NIMH. There was, however, a problem as to where to pigeonhole him. He didn't fit nicely into any NIMH slot. The Institute is organized into Intramural and Extramural Research divisions, both under the Office of the Director. The divisions are broken down into labs, and the labs consist of sections. On the organizational chart,

*We must begin to design our environment, or stagnation and, ultimately, extinction of the human species becomes a likely prospect.*

URBS was put under the Section of Perception in the Laboratory of Psychology, a field which has little, if anything, to do with URBS' activity. It was, at the time, a very small section.

NIMH could not, however, provide Calhoun with the research facilities he needed. An old dairy farm and \$100,000 were given to him by a private donor. Finally, twelve years after Calhoun was assigned his administrative pigeonhole, URBS moved into Building 112.

Despite URBS's somewhat arbitrary placement in the NIMH labyrinth, and despite the fact that the research may be considered psychological in nature, there are no psychologists on the URBS staff. Halsey Marsden, senior investigator, and Jerry Wheeler, program coordinator, are mammalogists. Garrett Bagley, the chief programmer, is a mathematician. Anne Hardman, in charge of quality control and data flow, is a biologist. Leonard Olson, researcher, is a physicist-architect, and Larry Bishop, in charge of observation and maintenance, is a wildlife biologist.

The titles assigned to this group of professionals are not hard and fast. In a couple of cases, they had to be thought up for the occasion. None of the URBS people is functionally independent, probably because Calhoun would not hire someone to take on only one small part of the total task. Nor does he see URBS as a place where independent investigators can come in and do their thing. Calhoun feels that this sort of detachment can no longer be tolerated by today's research scientist.

Each person working at URBS is involved with the entire project—they all have an emotional commitment to the same goals, they all have an intellectual appreciation of the science going on there, and they all help clean the cages.

To call such a group "participatory" would be to invoke a facile buzz word of our times. It's unlikely that any organization of seven professional people could institute anything as complex and cumbersome as a several-level hierarchy. Besides, the group's method of functioning is more subtle than the simple labels *participatory* and *hierarchical* can possibly connote.

In a strong sense, they have a two-level organizational structure: Calhoun constitutes one level, everyone else the other. This separation, this status differentiation, is more predetermined than instituted by design, for Calhoun rejects the traditional trappings of authority. Titles are not used. Calhoun freely shares his office space and his thinking and his work with the scientists who have joined him. The staff is aware of virtually everything that goes on affecting URBS. This awareness requires considerable discretion on their part, but involves them completely in the decision-making process. And Calhoun has tried to pull out of his role as laboratory founder.

But he did spend a large part of his life developing the theoretical structure and the experimental plan that support the lab-

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oratory. And Calhoun was the one who ac-  
quired the laboratory building, after years  
of effort, without a staff to populate it. So it  
is natural that his colleagues refer to the  
entire enterprise as "the house that Jack  
built," and it is inevitable that he is looked  
up to as their (not quite invincible) guru.  
And this happens despite the fact that  
John Calhoun, on the occasion of a minor  
lab crisis, can be found in coveralls in the  
middle of a huge mouse pen, doing the  
dirtiest of dirty work.

Still, it is incontestable  
that only one man in the group has arrived,  
has made his reputation as an established  
scientist, and the other, younger, people  
around him have not—yet. These younger  
people, too, have not gone to URBS simply  
to find a job; they have been attracted by  
the man and his science.

When Calhoun invites a scientist to join  
his staff, he is, in effect, asking him to do  
two things: first, an URBS worker must con-  
tend with a system of theories which re-  
quires him to confront doomsday on a  
day-to-day basis. The drastic implications  
of Calhoun's work, coupled with the slow  
response of our society to his warnings,  
can be a depressing umbrella to work  
under.

Then, due to the all-professional na-  
ture of the staff, the scientist coming to  
URBS must be willing to participate in the  
heavy, smelly, dirty work that would other-  
wise be handled by some sort of mainte-  
nance crew. This sort of support personnel  
is presently excluded from URBS due to a  
general lack of funds.

These two working con-  
ditions—the theoretical and the practical—  
are related in that they act to mitigate each  
other. Jerry Wheeler says that you have to  
keep in mind the connection between sav-  
ing the world and cleaning out mouse  
cages. The dedication to the theory, the  
trust in the value of research, makes the  
low-level work palatable. Anne Hardman  
takes this one step further. She won't trust  
some uninvolved person with the care and  
feeding of her subjects. She would rather  
handle the mice herself than give the  
responsibility to an uncommitted wage  
earner.

The menial work is necessary if one  
is going to do research, but it also seems  
to serve a need. Confronted with the ab-  
straction and rigor of a compelling theory,

the manual laboratory work can serve as a  
retreat for the scientist. In working towards  
a hypothesis that forecasts doom or sur-  
vival, the people at URBS need not think  
of these all-encompassing issues hourly—  
they can escape to the down-to-earth pros-  
pect of running an experiment, caring for  
animals, and tabulating masses of data.

More-  
over, each member of the group can, by  
actually running experiments, maintain his  
legitimacy as a scientist. The world is full  
of minor prophets and theoreticians. Not  
too many of them have data to support their  
pronouncements. Calhoun needs his data  
to maintain the respect of the scientific  
community. The others need it to acquire  
this respect.

Finally there is the aspect of  
control. Even if the people working at URBS  
cannot control the society they are living in,  
they can manage its analogue.

But why spend  
all that money to push mice around when  
you are merely confirming the things that  
you have been saying all along? Is the  
psychic support of the scientist and the  
aura of legitimacy enough of a rationale?  
Probably yes; because the impact of this  
research should be communicated to the  
people who respect documented results.  
But there is more—for Calhoun, the actual,  
physical experiments may very well be a  
symbol of perseverance against the many  
obstacles he encountered through the  
years. For the entire group, the ongoing  
studies are also a demonstration of tech-  
nique, of scientific methodology, of tech-  
nological innovation applied to the study  
of social dynamics.

## It took only three years of uninhibited population growth to kill a mouse society

Studying crowding and its effects on  
mental health, the group at URBS designed  
an experiment around the development of  
a freely growing mouse population. Al-  
though the subjects of the study are sim-  
pler organisms than man, the implications  
of this research for the human population  
are powerful. These implications, as well  
as the validity of drawing mouse-to-man  
conclusions, will be explored later.

Nearly  
three years ago, the experimental mouse  
universe (a closed physical and social sys-  
tem) began with a population of eight. It  
proceeded through four distinct phases,  
marked by radically different behavior  
which arose in response to the unchanging  
physical environment, the rapidly growing  
mouse population, and the resultant pro-  
gressively increasing social contacts.

The  
universe represents a physical utopia, in  
that the factors which customarily limit  
population growth are excluded. There is  
an abundance of food, water, and shelter;  
enough to adequately support a mouse  
population in excess of 3,000. Predators  
are eliminated, as is the opportunity for  
epidemic-producing disease. The finite,  
closed nature of the constructed universe  
prevents emigration as a population-re-  
ducing variable.

The first ("strive") phase of  
development was characterized as a period  
of adjustment to the universe and territorial  
establishment, culminating in the birth of  
the first litters.

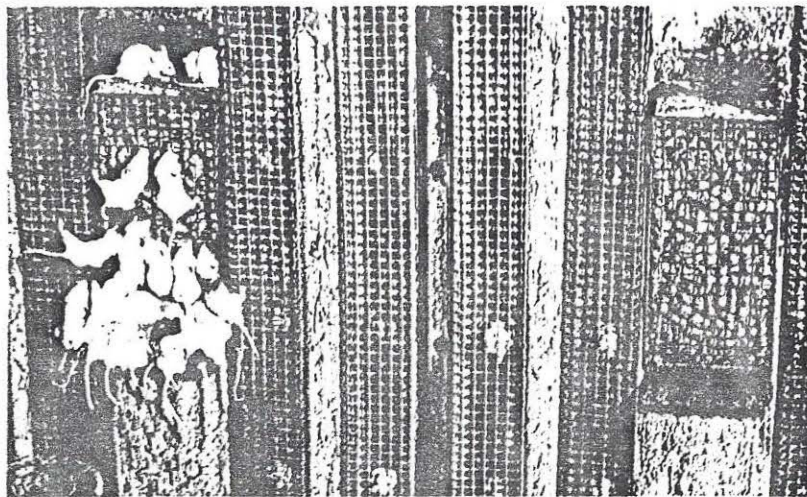
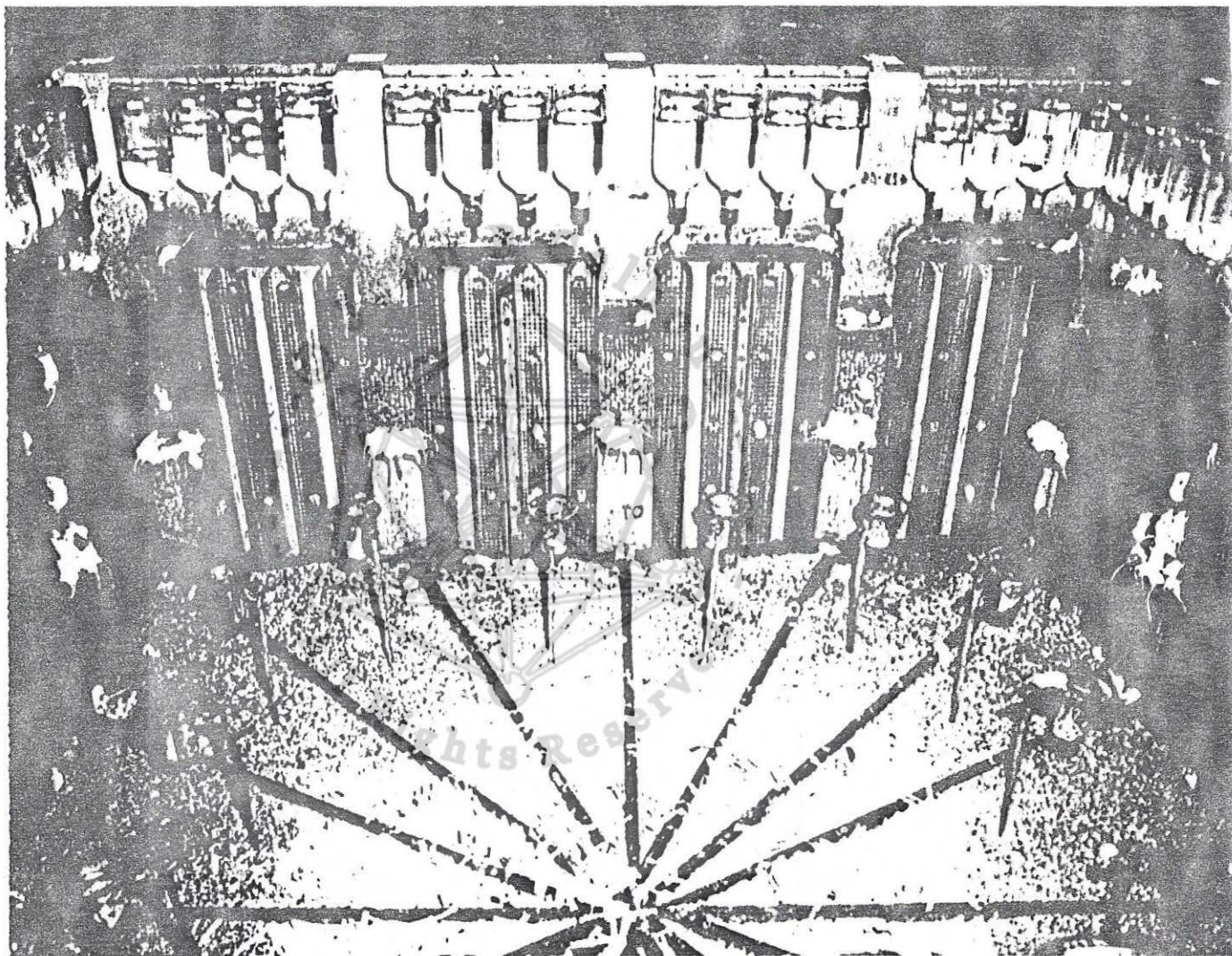
At this twenty-two-mouse mark,  
the population shifted abruptly into the  
"exploit" phase. During this time, popu-  
lation growth began to slow down, with a  
doubling time of 60 days. Available space  
was exploited by adult aggregates, in-  
cluding territorial males, and adult males  
and females. Although each cell in the  
mouse universe was structurally identical  
and afforded the same opportunity for  
acquiring food and water, they were sur-  
prisingly unequally utilized. As the popu-  
lation increased, the needs for food,  
water, and rest became associated with  
the presence of others, and certain "de-  
sirable" locations became overcrowded,  
while others remained unused. Despite



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The mouse universe contains enough space, food, and water to comfortably support over 3,000 mice. Despite these "utopian" circumstances, this structure housed the gradual demise of the entire society.

Like many people, these mice have developed an almost pathological need to perform even their most basic activities in the presence of others. Here, one food hopper is "overcrowded," while the adjacent one remains deserted.



## But the research reflects the problems of mice and men

Taken by itself, the URBS mouse study has little import—only negligible benefit may be gained by looking at this work as one animal experiment performed in one, restricted environment. Calhoun asserts that "in the end we can justify our experimental studies of animal populations only on the ground that insights from them will assist us in guiding the destinies of populations in more natural situations, whether they be of other animals or of man himself."

But this shift from mouse to man—the extrapolation from the simple to the highly complex organism—how is it justified?

To begin with, this leap is necessary. If the sort of research conducted at URBS has value—if we want to gain a thorough understanding of the problems arising from the increasing numbers of men—then animals must be the subjects. The use of humans is clearly unfeasible for both practical and ethical reasons.

There is simply not enough time to sit around and wait for all humans to reach an irreversible "die" phase before instituting corrective measures. Three years in the URBS mouse universe is the rough equivalent of 150 man-years. Evolutionary processes which men are too close to observe within themselves were clearly visible as they affected the mouse population.

Recognizing the limitations of man as his own subject, the validity of the mouse as an analogue must still be accepted. URBS investigator Halsey Marsden says that "there can be a true intellectual interface between studying the social dynamics of animals and those of man. This interface is possibly most fruitful in generating ideas and insights during the process of the study itself;

not always at the study's termination when all results are in and fixed, definitive, and final for the animal species in question."

Basically, the work at URBS has involved the ongoing observations of disruptions of standard social behavior. In the mouse, this "normal" growth and activity is determined by its genetic template. Learning influences and alters this hereditarily determined behavior. The human being, too, is guided by a genetic template, although learning and culture influence his behavior much more than his inherited pattern of characteristics. The activity of both mice and men is directed towards and influenced by social organization and contact. In both cases, this socialization is necessary for survival, education, and continuation of the species. The consequences of a breakdown in the social order of the mouse universe are likely to parallel similar results on the human scene.

In comparing the evolution of man to the growth of the mouse universe, it is tempting to begin with the similarities between the earth and the physical structure of the rodent habitat. The world, like its experimental analogue, is a closed system—at present, there is no opportunity for emigration.

For the time being, at least, the world's physical resources, primarily food, water, and space, suffice to support its population. (Calhoun does not dismiss a food shortage as a future problem, but makes it quite clear that his ultimate concern lies with the social variables that affect man.) Additionally, civilization and medical advance have gone far to remove human beings from the dangers of predation and epidemics.

Like the mice in the URBS study, men and their evolutionary ancestors have gone through phase shifts marked by differing rates of population growth. The strive phase, lasting 100 million years, ended with the biological evolution of man as he is today. During this period, all mammalian species increased their population as the mice did during their first interval of population growth—that is, each doubling took approximately the same amount of time.

Man shifted into the second phase of exploitation 43,000 years ago, as each successive doubling took approximately half the time of the previous one. We are now at the point where the doubling time is less than forty years. Unless this process changes in the immediate future we may anticipate instantaneous doublings within the next century. Again, Calhoun stresses that the number of people per se is not critical. Rather, increasing population growth in a closed system increases the number of social contacts per individual per unit time.

As our population has escalated, it is clear that we have altered our values as to how much space is necessary for living; we have redefined what *crowding* means. Like the mice, we have formed dense population aggregates and have come to associate the presence of others with our daily activity, thereby increasing the number of our social contacts. As an illustration of this accommodation to increasing numbers of people, Calhoun refers to what he calls the "Daniel Boone phenomenon." The story is told that at a point in our history, if a neighbor moved within forty miles of a person, that person would establish residence elsewhere—"it's getting crowded." We no longer have the opportunity of approximating this kind of value. In fact, it is unlikely that many of us could tolerate life to that degree of isolation. So we have already reached

The research discussed here is covered in Calhoun's articles:

1971 Space and the Strategy of Life, pp 329-387 in A.H. Esser (ed) The Use of Space by Animals and Men. New York, Plenum.

1973 <sup>R</sup>EVOLUTION, Tribalism, and the Cheshire Cat: Three Paths from Now. Technological Forecasting and Social Change, 4:263-282.

1973 Death Squared: The Explosive Growth and Demise of a Mouse Population. Proceedings of the Royal Society of Medicine, 66:80-88.

1973 From Mice to Men. Transactions and Studies of the College of Physicians of Philadelphia, 41 (2):92-118.

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"Two kinds of people must communicate more effectively with each other... the decision makers, such as yourselves, and the idea generators, in whose ranks I, perhaps, may be included."

John B. Calhoun

"The work of Calhoun and his associates is so compelling because it presents itself as true and crucial. Its implications for the survival of humanity as we know it are so immediately evident that more than most scientific ventures they seem to call for an immediate translation into public policy."

Matthew Dumont The cultural context of population research. pp 327-328 in Calhoun, J.B. Environment and Population: Problems of Adaptation. Praeger, New York, 1983

the stage where most day to day activity must take place in the presence of a "crowd."

We have, too, reached the point at which there is a fairly significant number of individuals who are well educated for entry into the social system, who are able to continue the adaptive evolution of the species, but who find no openings for the expression of this education. This feeling of rejection by society has already resulted in some violent lashing out against the system, as it did in the mouse universe.

Calhoun sees the violence resulting from an imbalance between product fabrication and product disposal as our species' first critical sign of trouble. Unless we apply some corrective measures, says Calhoun, "violence will escalate. This will be followed by an autistic-like self-centeredness, characterized by an inability to become involved in any complex behavior, particularly intellectual ones, requisite for survival. It is no accident that violence has come to characterize university campuses around the world. Here is concentrated that portion of the excess products of biological reproduction that are most capable of becoming involved in the development of mankind. In a literal sense, the adult traditionally and socially well-integrated dominant segment of society has rejected much of the youth just as assuredly as the early excess products in our mouse population were rejected."

We have also seen, in our culture, some breakdown of behavior according to established roles. Traditional units of organization, such as the family and the church, are undergoing revision, if not, some say, obsolescence.

Increasing urbanization, coupled with increased mobility and the accelerating pace of social and technological change, are making it more and more difficult to adjust to the world's rapidly growing population. Ultimately, the contacts from increased population become so numerous that they preclude the individuals present from deriving pleasure from repeated social interaction. Calhoun reminds us that the words "crowding, overpopulation, the population bomb, the population explosion, and the population crisis connote the imbalance between attained numbers of men and the inability of the individual to realize his potential for development."



When their "population bomb" went off, the mice lost their ability to procreate. For the mouse, procreation involves the most complex set of activities the species is capable of, as well as being a necessary condition for survival. Reproduction, and the rearing of viable young, require the existence of a stable, integrated social unit.

When we draw the comparison between mouse and man, and look for the areas in which man can fail, we must not conclude that at the next evolutionary phase shift, humans will necessarily be unable to procreate. Rather, like that of the mouse, man's failure is likely to affect the most

complex functions of which he is capable — the creative, the conceptual, the intellectual.

As a producer, man generates ideas, as well as others like himself. Both are essential for his survival and continued evolution. And both are being produced at accelerating rates. Seven cultural revolutions have occurred during man's two-million-year history: the successive establishment of the first three species of the genus, settled agriculture, the period of the formation of the major religious philosophies, the scientific revolution, and the present electronic-communications revolution. The interval between revolutions is decreasing so that each major cultural upheaval now arrives four times as quickly as the previous one. Carried too far and too fast, this acceleration could paralyze mankind.

Should man's conceptual capacities break down under the pressures of increasing population and escalating change, a frightening possibility exists: his creative capacity to solve the problems of social complexity may be disabled to the point where the problems mushroom beyond his control, and the systems that man has created will begin to run away with themselves. Some people already feel that the locus of power and influence is sufficiently complex and unapproachable that they are past the point of being able to correct things. Should this eventuality occur, we will have entered our "die" phase with no possibility of reversing its course.

But dying is not our only option.

We now have the choice of directing our evolution along one of three possible paths. As men, not mice, we have some capability of *prediction*, and, fortunately, at least a partial awareness of the problems that we face. We must, according to Calhoun, make this choice now or the current trends towards uninhibited population growth and failure to properly utilize our products will, in themselves, determine our destiny.

The one catch to the choice that we must make is that it will have to be made in a blind alley. In effect, we have three experiments to perform, but we only have the facilities to do one. The choice will have to be made before entering into the experiment, so that we cannot await knowledge of the consequences before taking our evolutionary gamble.

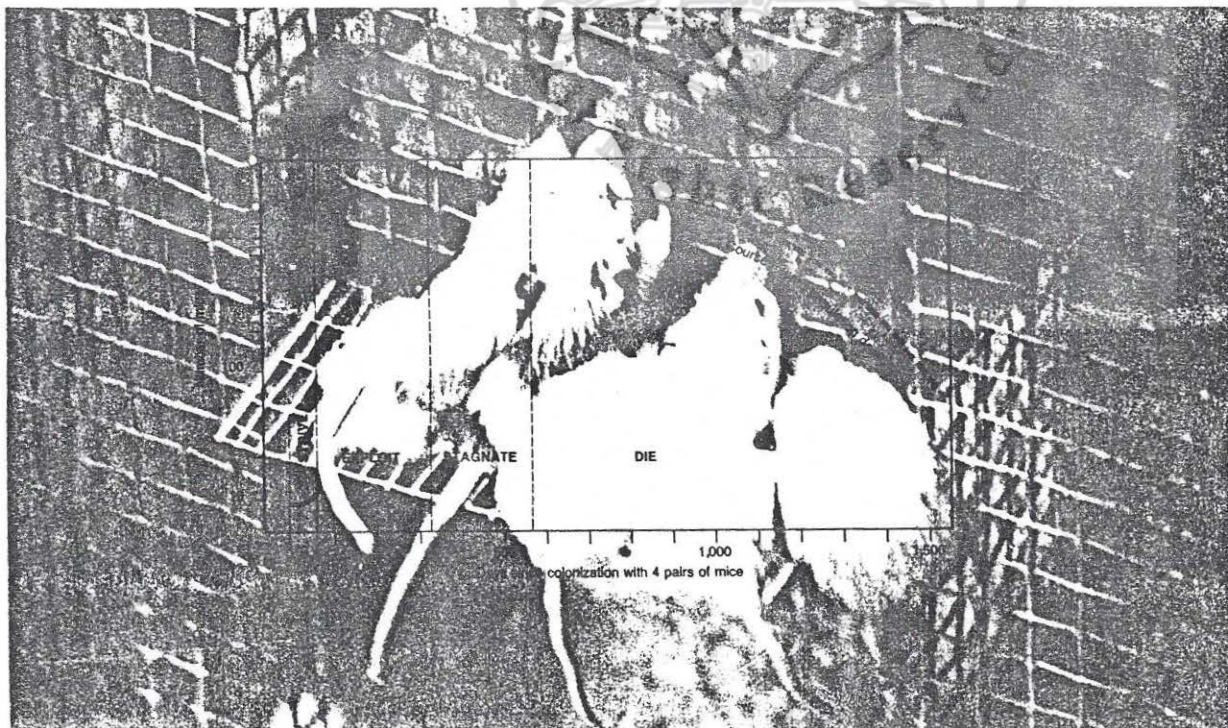
If we choose to do nothing in the face of the increasing number of environmental warning signals, we will have

opted for the way we may exist in the twenty-first century we will live with stagnation and human with society.

We can exist in a "survival" phase, but this evolution problems on, with each case imminent. Ze take place, would accomplish essentially st plicated rather former knowledge societal crisis one on an a

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From utopia to hell in three years: this chart shows the development of the mouse population through the initial phases of striving and territorial exploitation to the final stages of stagnation and death.



The evolution of the rodent society presents us with evolutionary options in terms of population over time.



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opted for the "die" course. In this event, we may expect that by mid-twenty-first century we will be approaching extinction, with stagnation, misery, and large-scale human withdrawal characterizing our society.

We can, on the other hand, choose an "exist" pathway. This road promises survival, but little else. Should man select this evolutionary route, he would meet his problems on a crisis-to-crisis basis, coping with each catastrophe only as it became imminent. Zero population growth would take place, but zero ideational growth would accompany it. Society would remain essentially static, roles would become replicated rather than extended, and only former knowledge would be applied to societal crises as we approached each one on an ad hoc basis.

Other organisms, such as the lung fish, have adopted this

model and survived for millions of years. They have found their ecological niche and shut themselves off—from death, but also from opportunity, from challenge. Our present method of coping with disaster seems, unfortunately, to be a precursor of this avenue of approach.

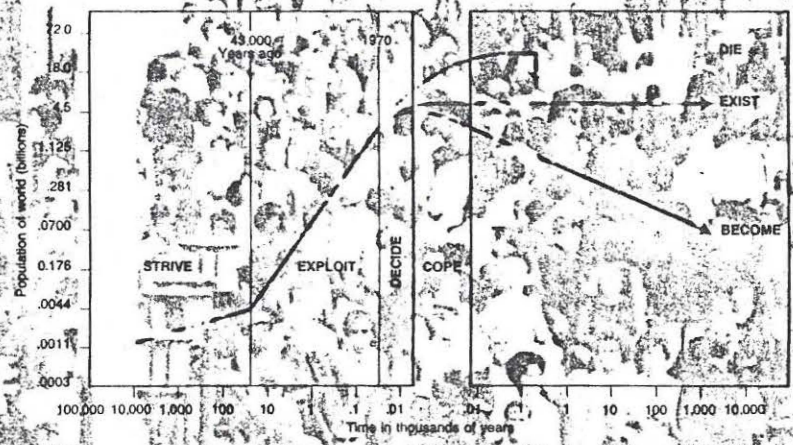
The other open road—the optimistic one—is the phase Calhoun labels "become." He sees its entrance via evolutionary designing and the continued increase of environmental awareness. Two conditions must be met before man can reach this phase: he must decrease his population growth and he must develop systems capable of handling, interpreting, transferring, and utilizing information far more effectively than is being done at present.

Biological evolution is hardly the issue here. Rather, social evolution, or the effective relating of vast numbers of problem solvers constitutes the task at hand. Our present networks are proving inadequate to effect change directly, so we must look beyond existing institutions to a core of environmental designers who could emerge from diverse disciplines. Calhoun believes we must first identify representative individuals in each of the disciplines, and then provide them with the opportunity of developing recommendations and de-

fining goals with the assurance that their efforts will be met with institutional response.

Once these environmentalists have been located and given their tasks, they may concern themselves with the tactical problems of our polluted water and air, our burgeoning population, and our unlivable cities. But these involvements must be put into perspective as actions necessary to fulfill a more comprehensive strategy of evolutionary designing. Research must be continued regarding the effective operation of our increasingly complex systems. We cannot afford to be boxed in by the monsters we have created. Alerting units should be established to condense and relate information, continually monitoring the effects that our systems and institutions have on the environment. In this way we may hope for nearly instantaneous feedback regarding the consequences of our actions. And, finally, we must have an ongoing evaluation of both present and future policies that may disturb or enhance our environment.

The evolution of man can be shown to parallel the course of the rodent society. Here, Calhoun presents us with three evolutionary options, defined in terms of population growth over time.





Despite an increasing popular concern regarding our environmental problems, and despite the many small steps that somehow get taken, URBS' ambitious program seems difficult to implement in the face of our increasingly unresponsive established institutions.

These difficulties become apparent when one considers that URBS remains partially crippled by its organizational position within the morass of a huge government structure. Despite the fact that NIMH is one of our more compassionate institutes, and despite the fact that both the head of NIMH and the head of Intramural Research provide effective leadership, URBS is constrained by the typical problems of a large bureaucracy.

The structure of NIMH relegates URBS to a firm slot in the Intramural Research Division. This slot more or less restricts the group to a pure research environment, tending to shield it from confrontation with the outside world. This is fine for the scientist who would like to concentrate on his controlled subjects, but not so great if he also wants to affect the uncontrolled people outside. Then, too, URBS and the Intramural Division operate under somewhat different biases. One has the feeling that NIMH would still like to see conventional parameters, would opt for investigation of a few parameters at a time, rather than extended social implication and analogue.

URBS, while recognizing the classical value of a step-by-step approach in studying smaller and smaller aspects of reality, does not think we can afford the time or the money to perform the thousands of experiments that this traditional scientific logic would demand. URBS is trying to shake up society, and the careful step-by-step investigation of minutiae rarely has much impact.

The people at URBS refer to themselves as the bastard, but accepted, children of NIMH. They are looked at as being just a bit different from all those other research groups. They are supported, just adequately, but not really nurtured or overfed. And they are kept within the system as though someone realizes that, sooner or later, they're going to be quite useful.

Just as the mouse universe is a reflection of what man—at his worst—may approach, the effort at URBS represents the type of thinking and working that might just save us from getting there.

As this article was being finished, URBS was elevated to section status. Rather than constituting a group under the Section on Perception, URBS became the Section on Behavioral Systems (SOBS) of the Laboratory of Brain Evolution and Behavior. This lab was housed in a brand new building, and properly dedicated according to government custom. Although this dedication represented merely the construction of a new edifice, it must mark a heightened recognition of the importance of the group's work.

This recognition has come from both the scientific community and the government. In commenting on Calhoun's "careful behavioral and physiological investigation," Edward T. Hall, professor of anthropology at Northwestern, remarks that "the implications of this work to humans are valid—our anatomy and the way we respond to stress both correspond to rodent characteristics. It's highly relevant to anything having to do with the crowded situation, and that's certainly where the world is going."

On April 1, 1971 Sen. Bob Packwood of Oregon entered several of Calhoun's papers into the Congressional Record, stating that "he is studying one critical and timely aspect of the population problem. Certain lessons can and should be learned as our finite earth looks forward to four billion people."

So people are sitting up and taking notice. But if it took three months to acquire the orchid paint through the intricate mechanisms of government, how long is it really going to take to change the world?

Completion in 1973 of the research discussed in the present article led to a National Institute of Mental Health approval in January 1975 of the initiation of a massive last effort by Calhoun. His intent was published in 1976 in *Populi*, a journal of the United Nations Fund for Population Activities:

Calhoun, J.B. 1976 A Scientific Quest for a Path to the Future, *Populi*, 3: 19-28.

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Comments the Author

*Population alarmists talk of simply reducing numbers of people. Others maintain that these numbers need only be redistributed. These are not real cures.*



Nina Laserson

It's difficult to live and work in any large city and *not* think about overcrowding. The trouble is that the thoughts you have while pushing through the crowds are rarely the sort that can lead to solutions.

Living in the city, and considering only urban congestion, you lose a sense of perspective. Escape to the suburbs or the country becomes a solution. Pouring more money into newer and higher buildings becomes a solution. But these "remedies" merely serve to redistribute the population and fail to consider that the problem is really global.

We cannot afford to ignore the problems of distribution of people, the effective relating of these people through governmental or institutional networks, and the reduction of numbers. But we cannot assume that any one of these tactics will work by itself.

We need global systems thinkers, environmental designers, or, specifically, people who can maintain a sense of evolutionary perspective while trying to help the world out of its immediate difficulties.

John Calhoun is one of these men. I first heard about his research at a Columbia Graduate School colloquium. At the time, the mouse universe was barely a year old, and although the social problems this population was experiencing were apparent, it was not clear to me that the mice would wind up on the road to extinction.

The colloquium was fascinating, although having heard it in the sterile, removed classroom, and having listened with the somewhat jaded attitude of a graduate student, I didn't go home and lose much sleep over the plight of the people-world. Now, more than two years later, I found my visit to URBS much more compelling. Looking at a dying group of animals is a much more powerful experience than hearing about them.

So my next task was to communicate this experience to a group of readers who were quite removed from the laboratory. Would the devastating implications of the research come across, and, if they did, what could an individual do about the situation we face? My first reaction was that if I had managed to frighten people just a little bit, increased awareness of our predicament might lead to ready acceptance of the solutions—if and when they are offered. But then, perhaps *Innovation* readers are in a position where they can help solve the problems. Concerned with "creativity" and technological improvement, concerned with the effective relating of people within networks, maybe this readership would include potential environmental designers.

And if not, perhaps Calhoun's research, as well as the way he runs his lab, might just say something about organizational effectiveness. Before putting the issue down and lapsing into standard routine, there are some questions the reader could consider.

► The people in Calhoun's lab say that they work well under the pressure of "keeping up with an inveterate complexity-seeker." In your organization, are employees isolated from the complexities—the challenges—which can serve as powerful motivators? In short, are you overprotecting?

► Because the URBS people do not have clearly defined roles, there is a great deal of variety in the tasks they perform. Although the very small size of URBS makes such functional diversity relatively easy to implement, certainly even in the large corporation monotony imposed by limited job definitions can be reduced. Are your employees constrained by the specs of their jobs? Are their abilities optimized or ignored?

► URBS' research amplifies a theme that has run through *Innovation* since its earliest days—that the environment (physical and social) in which people work has a far greater impact on the way they function than we are yet aware. Furthermore, we are just learning how to manipulate this environment towards favorable ends. This theme was treated from various viewpoints in "Building a Creative Environment" (Issue 5) and "Offices as Disaster Areas" (Issue 21). If you take these warning signals seriously, then shouldn't you have at least one person in your organization who is the kind of environmental thinker that Calhoun calls for?

► And, finally, are you falling into a mousetrap? The rodents in Calhoun's study were following an essentially predetermined course to doom. They did not have the ability to change their route. They were organized into flexible social units. Is your corporation so rigidly put together that it cannot bend when social, psychological, or physical factors demand restructuring? Will your organization be able to recognize and respond to changing environmental circumstances? Isn't this flexibility what innovation is all about?

Nina Laserson

**Beyond This Article**

Of necessity, this discussion of the URBS work has explored only the highlights of the research. For those readers who would like further insights into the experiments, the predictions, and, particularly, the philosophy of Dr. Calhoun, the following articles are suggested:

"The Social Use of Space," pp. 1-187 in Vol. 1, *Physiological Mammalogy* (Academic Press, 1964, \$13.50) and "Space and the Strategy of Life," *Ekistics*, Vol. 29, No. 175, 425-437, both detail the principles of social organization as they are related to the physical use of space.

"Population Density and Social Pathology," *Scientific American*, Vol. 206, 139-148, discusses a previous study, conducted with rats, that explains how proximity of individuals can become pathological when the developed need for association with others overrides basic needs.

Calhoun's chapter "Promotion of Man" in *Global Systems Dynamics* (S. Karger, Basel, Switzerland, in press), talks about the processes that influence man's prospects for living hospitably with his environment.

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