The urban animal:
Population density and social pathology in rodents and man

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Population Density and Social Pathology

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In the celebrated thesis of Thomas Malthus, vice and misery impose the ultimate natural limit on the growth of populations. Students of the subject have given most of their attention to misery, that is, to predation, disease and food supply as forces that operate to adjust the size of a population to its environment. But what of vice? Setting aside the moral burdens of this word, what are the effects of the social behavior of a species on population growth—and of population density on social behavior?

Some years ago I attempted to submit this question to experimental inquiry. I confined a population of wild Norway rats in a quarter-acre enclosure. With an abundance of food and places to live and with predation and disease eliminated or minimized, only the animals' behavior with respect to one another remained as a factor...
Rodent Ecology Project
Johns Hopkins School of Public Health

Figure 1.—Typical backyard scene in the row-house area of Baltimore where the various members of the Rodent Ecology Project conducted many of their studies on the biology of the Norway rat. Photograph by John T. Emlen, Jr.

Fig. 1.—Central block. Alien rats were released in the center of the central court. Yards average 13 feet in diameter.
Figure 4.—View of the pen in late April 1948 looking northeast from the observation tower. The South Alley Burrow is located just to the right of where the observer is taking notes. At the four entrances to the Food Pen in the center are placed the activity recorders in the black tunnel boxes. Photograph by F. Di Gesnaro.

Figure 57.—Aggregation of rats in box 30 on December 22, 1948. In addition to the 14 seen here there were 9 others in this aggregate which were crowded into a burrow nest cavity (see Fig. 33) immediately adjoining the box at the lower right. The unbalanced sex ratio of 17 males to 6 females was one indication of the low social rank of this large aggregate.
Calhoun and Ahuja, UNFPA predictions

From: P. M. Hauser (ed.) World Population and Development, 1979
Naked Ape and Human Zoo
Konrad Lorenz
(1903-1989)
Reclaiming the physical

“… these rat experiments gave some clue as to the social concomitants of the physical pathologies observed in previous behavioral sinks… With these findings as incentive, one might well imagine a groundswell of activity among human ecologists to apply this perspective to human life... Yet… pioneers of ecology have left the study of these crucial phenomena behind them in the dust”

William Michelson, 1970.
“Personally, I feel like an impotent observer standing on the deck of the Titanic as it sails toward destruction, watching the majority of the passengers amusing themselves at their various entertainments... I suspect that the population biologists are correct in their pessimistic predictions.”

Demography and human ecology

Correlations between density and pathology through census and survey.

“We... take the animal studies as a serious model for human populations.”

Births, deaths, infant mortality, illegitimacy, tuberculosis, public welfare and child assistance rates, suicide, venereal disease, mental hospitalization, delinquency, crime and divorce.
The psychology of the “physical”

Experimental:
  Task-related crowding experiments in the laboratory.
  Jonathan Freedman

Institutional/field:
  Statistical, medical and observational studies and in-depth interviews in prisons, hospitals, dormitories, and classrooms.
  Andrew Baum, Paul Paulus.
Andrew Baum and Stuart Valins. 1977. *Architecture and Social Behavior: Psychological Studies of Social Density*

*Figure 1. Floor plans of the dormitory floors. (Part a is the long-corridor floor, b is the short-corridor floor, and c is the intervention floor.)*
“… civil riots in Newark, Memphis, and even Washington, D. C. This ultimate manifestation of population density will not cease until population control is a fact.”

“No small part of this ugly barbarization has been due to sheer physical congestion: a diagnosis now partly confirmed with scientific experiments with rats – for when they are placed in equally congested quarters, they exhibit the same symptoms of stress, alienation, hostility, sexual perversion, parental incompetence, and rabid violence that we now find in the Megalopolis.”

Lewis Mumford 1968
Pruitt-Igoe, 1956-1972

“... social conditions in the project deteriorated to a level close to Calhoun’s (1962) description of a “behavioral sink.” The level of disorganization and conflict was sufficient to produce the Spinks brothers, outstanding in their boxing skills and motor offences...”
A. R. Gillis 1983.
Social Disease
“Everybody assumed that lack of space would be harmful. When in 1975 Freedman announced that he could find no evidence that this was so, there was a collective gasp, similar to the one that must have occurred when a child pointed out that the emperor had no clothes.”

FIGURE 15-3  Floor plans of long-corridor dormitories and suite-design dormitories at the State University of New York at Stony Brook. (From Baum & Valins, 1977.) Which of these dorms would you prefer to live in?
Figure 4. Culture-inducing universe for rats.

The front wall of this 9 x 18 x 12 ft (2.74 x 5.49 x 3.66 meters) space is removed. B = food resource compartments, C = a "STAW", a cooperative drinking device. D = water resource compartment containing 4 STAWS. E = public, intercompartment, space. F, G, H = residential compartments, shelves with suspended nest boxes. E to I = part of 2 ramp and tunnel systems leading to two 9 x 9 x 12 feet (2.74 x 2.74 x 3.66 meters) cooperative, creative, learning spaces. An identity recording portal is attached to each opening between compartments, such as between B and E.
"I would propose that the effects are due at least in part to problems involved in the social interaction among the animals. Much of the evidence indicates that the number of animals may be more important than the amount of space per animal."

Freedman (1975).