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Yale University—and is thought to be the first one born in captivity. Perhaps it is meant that it is the first baby lemur of this particular species born in captivity, although the wording of the statement does not indicate this. Here at the Bronx Zoo baby lemurs (black lemurs) have been born and reared since about 1902. There have not been a great many born, however, and the last was reared here in the late 1950's. Perhaps other zoos in the country have also reared baby lemurs from birth.

DORIS S. CELLARIUS

New York Zoological Society,  
New York

### Shelter Program

Howard Margolis's comments [*Science* 135, 776 (9 Mar. 1962)] on the Peace Research Institute report, "The Shelter-Centered Society," fail to make clear that the report was based on the deliberations of *several* qualified social scientists (the undersigned), and that although the report was written by Arthur Waskow for the institute, there was essential agreement among us on its substance.

Margolis also fails to make clear that the report is concerned with the consequences of a large shelter program—that is, of a "shelter-centered society." We believe, on the basis of evidence and arguments set out in the report, that the evolution of such a society is highly likely once a civil defense program is begun, even if it is the initial intention to keep the program small. And on the one point in the report which Margolis does emphasize (and repudiate)—the probable adverse effects of civil defense on disarmament—direct evidence is presented in the report that the effects have already been disadvantageous where hope for disarmament is concerned. For the future, the report warns of possible regimentation developing from a large shelter program.

The report also emphasizes that careful study is needed to determine whether control of civil defense or juxtaposition of other public programs can mitigate or eliminate the undesirable effects foreseen to follow from a large program.

As social scientists we know that no one is completely unbiased in his interpretation of reality and assignment of priorities; but as social scientists we also believe that understanding of the implications of a shelter system for a so-

ciety's political processes can be greatly increased by carefully applying systematically derived knowledge about men and their institutions. This we assiduously attempted to do during our deliberations and in reviewing drafts of the report, by recognizing the limits of humans as "objective" evaluators, the limits on the present armamentarium of social science, and above all, the limits on foreseeing the future.

To this end the report states: "Applying the established knowledge of social scientists to the situation which might be created by the existence of a civil defense system cannot, of course, produce iron-clad predictions of what will happen. But it can point to the kinds of problems that are likely to develop—problems whose avoidance or solution will tax all the ingenuity of people and government, problems which therefore demand serious thought before action is taken that could make them and their consequences impossible to cope with."

RAYMOND BAUER  
URIE BRONFENBRENNER  
MORTON DEUTSCH  
HERBERT HYMAN  
ERIC LINDEMANN  
DONALD MICHAEL  
DAVID RIESMAN  
ARTHUR WASKOW  
STEPHEN WITHEY

In "News and comment" [*Science* 135, 776 (9 Mar. 1962)] Howard Margolis discusses the civil defense debate. In commenting on the papers published by a group of eight scientists, he does not realize that these papers purposely do not speak for or against shelters. Yet, he does understand that they prove the utter foolishness of the government program.

In his presentation, Margolis does not bring out the following salient points.

1) A pure fallout-shelter program will protect at best only a small portion of the American population in the event of a nuclear war. To deny this would be to assume that the adversary would, out of sheer kindness, not aim at the large population centers.

2) If a substantial part of the population is to have any chance of survival, thermal effects in shelters cannot be disregarded.

3) Because of the heat generated by the human body the temperature within the shelters will rise within a few days to unacceptable levels un-

less cooling equipment is provided or cold air can be drawn in. Such ingestion of cold air would bring with it the danger of drawing in air contaminated by fallout particles.

4) In order to reduce the unacceptable rise in temperature in the shelters, it would be necessary to make the shelters much larger than the government proposes.

5) Concerning the cost of shelters, much more than the mere construction costs have to be considered. When all costs are taken into account we find

that a program which may make it possible for 120 million Americans to survive would cost in the neighborhood of \$300 billion.

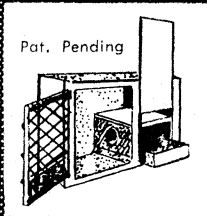
6) Such a program would require a construction effort five times the present total national effort and, therefore, would require that all civilian and military construction, including construction of all armaments, be ended, unless the program should be stretched out over many years.

7) Even if we were to go in for such a program, the survivors coming out

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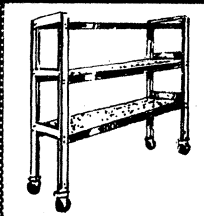
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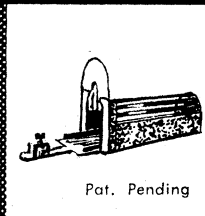


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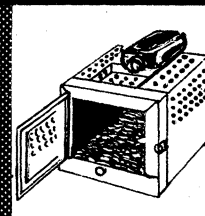


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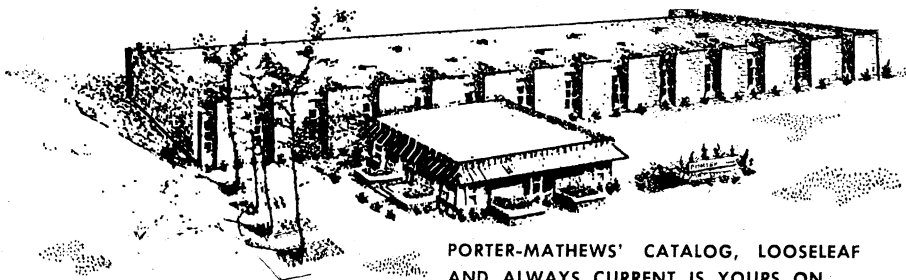
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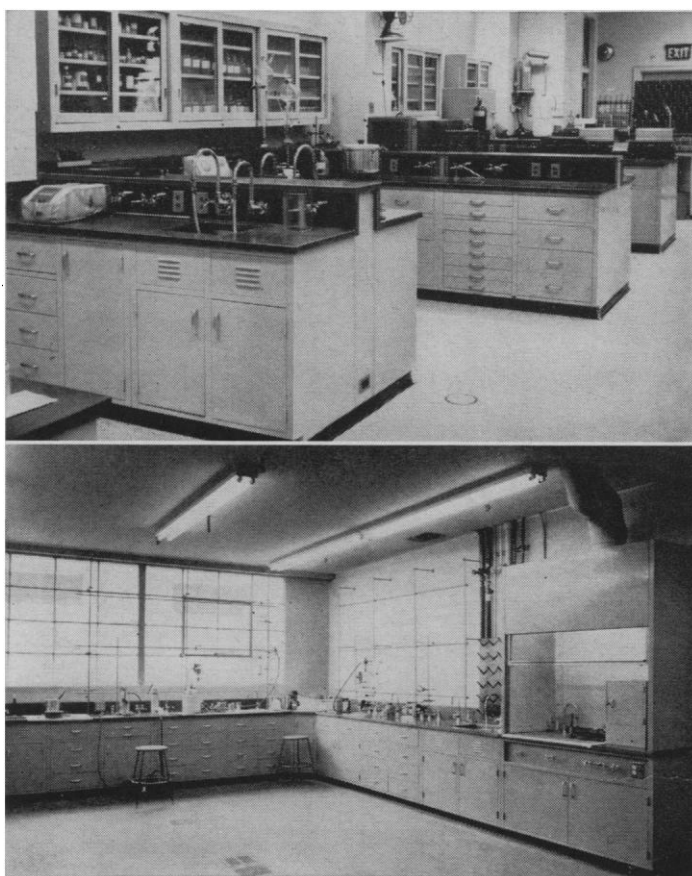
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of shelters would find their surroundings nonviable.

8) Since the building of shelters may increase international tensions, it is possible that such a shelter program would endanger rather than save lives.

If Margolis had tried to disprove any of the contentions in the papers one could argue with him, but unfortunately he did not discuss the contents of the papers.

V. PASCHKIS

*Heat and Mass Flow Analyzer  
Laboratory, Columbia University,  
New York*

I am not sure what our correspondents mean by a "large" program. The term is defined only as it is related to a shelter-centered society, and *this* term is not defined at all, either in the letter or in the report. If they consider the currently proposed program "large," then I can hardly have misled anyone by not specifically saying the Peace Research Institute was talking about the proposed "large" program, since that was what my entire article was about. If they mean large as compared to the proposed program, then they are surely guilty of seriously misleading their readers. The report clearly and unambiguously says it is talking about the "impact of the newly proposed shelter program." Equally clearly, the argument that the program might grow is stated in the report neither as emphatically nor as prominently as the reply to my comment may suggest, and it is, in any case, given as a possible additional hazard of going into civil defense, not (as the reply may seem to suggest) as the basis for the analysis. In sum, then, if the writers of the PRI report were talking about the proposed program, their complaint is trivial; if, on the contrary, they were talking about some undefined "large" program, then they have drastically misled their readers.

Our correspondents quite properly point out that "no one is completely unbiased" but that this does not rule out useful analysis by social scientists. But there is a reasonable limit to the degree of bias that can be excused in this way. On the disarmament question, for example: In its description of a spectrum of possible policies to deal with the threat of war, the report presents effective pursuit of disarmament as flatly incompatible with a civil defense program. Do our correspondents really believe the report presented

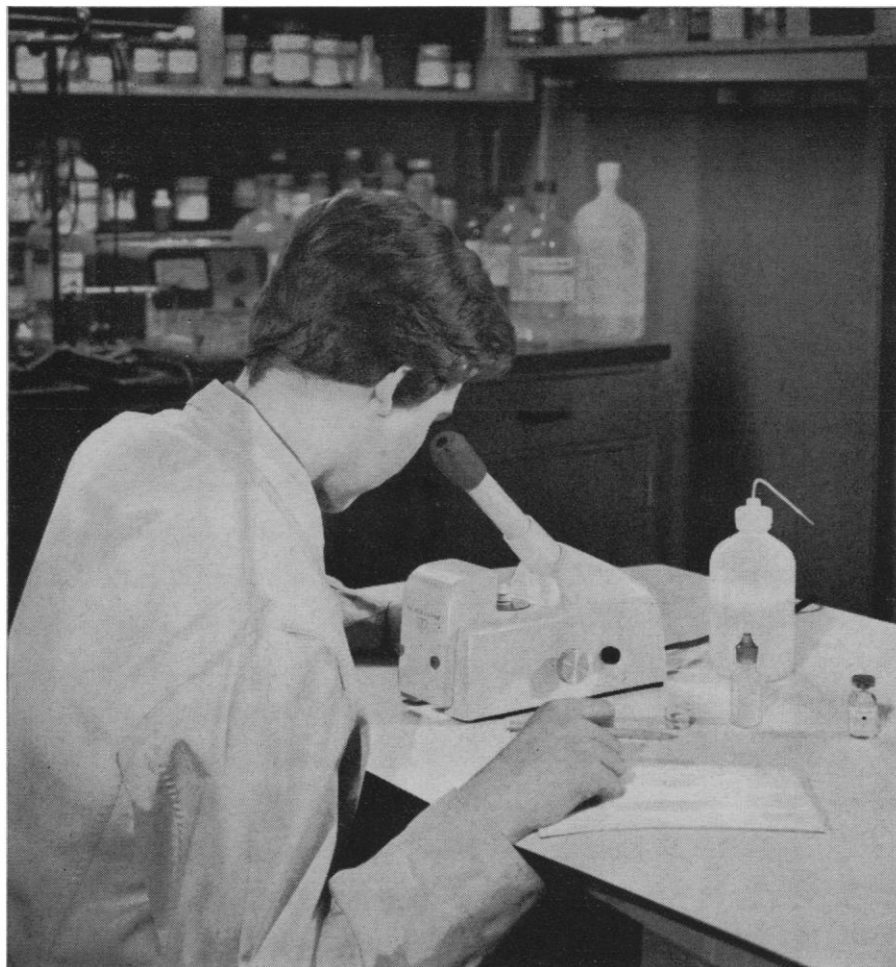
enough, or any, "direct evidence" to justify giving readers the clear impression that a choice *must* be made between having a civil defense program and seeking disarmament?

As for Paschkis's letter, in my comments I said that the papers were largely irrelevant to a discussion of the proposed program. The report is directed, or misdirected, mainly toward demonstrating the "utter foolishness" of a deep-shelter program, which no one in a responsible position has advocated. This misdirection comes from the fact that the preface to the report assumes, without any argument more detailed than what is given in Paschkis's point 1, that the only kind of nuclear attack worth considering is a massive attack on our cities. From this, the report assumes that any shelter program "must" include blast as well as fallout shelters. The point is not that these are necessarily unsound assumptions but that once you have accepted them you do not have to read the report. If a shelter program, to be even worth considering, must include blast shelters, then the Administration program, which does not include blast shelters, is not worth considering.

It is possible to dig out some arguments that could be used specifically against the Administration program, but the report, because of its underlying assumptions, is not organized to present a coherent case against the program. Consider, for example, the paper summarized in Paschkis's point 3: Shelters of the kind the government is recommending have 100-percent air intakes. Therefore the fairly detailed discussion in the report of overheating where there is whole or substantial reliance on self-contained air systems is irrelevant. A discussion of how seriously, if at all seriously, the air intake would reduce a fallout shelter's value would have been very relevant. But there is no discussion of this point beyond mention of it as something to consider.—HOWARD MARGOLIS

### Space Messengers

Although Leslie C. Edie, of Bellmore, N.Y. [see *Science* 136, 184 (13 Apr. 1962)] and I are separated by less than a mile in distance, we are many miles apart in speculating on the possibility of "intercivilizational" communication via coded messages on "meteorites, comets, and other space travelers."



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