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ter at Duquesne University. In that regard, I welcome the comments, suggestions, and cooperation of scientists everywhere who share these views.

JULIUS S. GREENSTEIN
Department of Biology, Duquesne
University, Pittsburgh, Pennsylvania

Village Solidarity

Peter Suzuki [*Science* 132, 891 (1960)] makes a most important point and one which I had almost despaired of seeing in a "neutral" journal—that of "village solidarity." While he may overstate the case by saying that what "is generally taking place in many of the underdeveloped countries is a ruralization of the cities. . ." (since the majority of these cities were hardly urban within the meaning this term has assumed in recent years), yet it must be stated repeatedly that, with few exceptions, aid administrators continue to err in failing to recognize that this group attitude is a prerequisite if their rural programs are to meet with success. The opposite view, held in the past and still the principal method of assistance—that this sense of common identity and common purpose must be altered or eradicated before change can take place—has resulted in the almost unqualified failure of rural development programs carried on by the International Cooperation Administration and its predecessors throughout the so-called "underdeveloped nations." I am therefore quite happy that Suzuki has supplied us with an additional case study to substantiate my criticism of the direction these programs have taken. [*"Social and political aspects of Philippine economic development,"* Philippine Council, Institute of Pacific Relations (Kyoto Conference, Pacific Council, Institute of Pacific Relations, 1954) (mimeographed)].

CHARLES O. HOUSTON, JR.
Division of Industrial Cooperation,
Smithsonian Institution,
Washington, D.C.

Developmental Selection of Mutations

We should like to comment on the interesting and provocative report by L. L. Whyte entitled "Developmental selection of mutations" [*Science* 132, 954 (7 Oct. 1960)]. Whyte is well known as a perspicacious and imaginative thinker and, as always, his writings are worthy of consideration. If we understand his report correctly, however, the problem to which he alludes does not really exist.

Whyte's main point seems to be that there is a class of mutations whose role in evolution has not been appreciated by students of the evolutionary process. These are the mutations which prevent "internal organizational efficiency permitting continued growth." In other words, he is referring to lethal and detrimental mutations whose effect is manifest during morphogenesis, as opposed to those genes whose morphogenetic effect is to produce an adult ill-adapted to the adult environment. We are rather aghast to learn that a perusal of the literature has left Whyte with the impression that such genes have been neglected. The existence of a very large class of embryonic lethals is very well known to evolutionists and geneticists in general. Elementary textbooks of population genetics always begin by a discussion of gene-frequency changes in populations, in which unconditional lethals are segregating, before going on to the discussion of more subtle forms of natural selection [see, for example, C. C. Li's textbook, *Introduction to Population Genetics*]. If general works on evolution fail to deal explicitly with such lethal genes, it is largely because they are so well known that it hardly seems worthwhile calling further attention to them. As a matter of fact, Lewontin and Dunn have recently published [*Genetics* 45, 706 (1960)] a report on the evolutionary dynamics of a series of unconditional embryonic lethals in wild populations of *Mus musculus*.

There is, however, a more subtle and more important point here. Students of evolution have emphasized the interaction of environment with genotype because they have for some time realized that there is no real distinction between "developmental selection," as Whyte so aptly calls it, and post-embryonic adaptation. There is no sharply defined boundary between unconditional embryonic lethals and those whose effect is intimately bound up with environment. There is, rather, a continuous spectrum of gene effects, from those genes whose action seems virtually independent of any environmental modification, to those whose sensitivity to environment encompasses every slight change of physical and biotic milieu.

We would venture so far as to say that no gene is totally independent of environment in its expression, and therefore the fitness of every genotype is in some measure a function of environment. It is, of course, true that early embryonic lethals whose effect is to completely disrupt the normal morphogenetic pattern to the point of death are less susceptible of modification. But they are not wholly insensitive to it. In general, the more protected