ports on promising compounds have been sent to study sections. Some of these leads have formed the basis for individual or small-group research supported by other branches of NIH. In the field of hormone bioassay, over 2500 compounds have been tested to determine a profile of endocrine activity. Relationships of chemical structure to biologic activity cannot be properly presented until enough of the profiles are completed. The first of a series of monographs has recently been prepared on androgenic and myogenic compounds. Others are in preparation on estrogens, progestins, and corticoids. Numerous compounds tested for pharmacologic and toxicologic activity have given rise to promising therapeutic approaches which will take years to carry out. The reports, again, have been made not in the usual manner but in the form of internal reports to clinical groups, drug evaluation committees, and so forth.

It is suggested that more funds be made available to the administrative section of Cancer Chemotherapy, for the employment of a staff for data analysis, condensation, and dissemination to the scientific world as well as to the general public. Simple data such as the LD_{50} in mice of 75,000 drugs are now available and need to be prepared in a more accessible form.

The efforts of the Cancer Chemotherapy Program may be compared to an iceberg in that only a fraction of its bulk is apparent. The investment of relatively small amounts should make available masses of useful information.

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Biologists' View of Mars

The recent report, *Biology and the Space Sciences* (National Academy of Sciences–National Research Council, Washington, D.C., 1965), by a committee of biologists set up to advise the federal government on space studies, is disturbing. The report implies that there is every reason to believe that life on Mars is a reality and that this nation is justified in putting enormous effort and much treasure into an attempt to identify such life. It is apparent that the sense of this report is diametrically opposed to the view expressed so well in Abelson's editorial "The Martian environment" (12 Feb., p. 683). I am particularly concerned about the *certainty* expressed by the committee. One would think from the tenor of the report that there is available solid information which would allow us to conclude that life is present on Mars. It may be that secret information not available to run-of-the-mill biologists was available to the committee, for I do not know where in the published literature they could obtain sound data to support their very strong conclusions and recommendations.

It seems clear from a variety of sources that virtually no free oxygen can be expected in the atmosphere of Mars. One speculation suggests that oxygen in the form of ozone may be found at the surface of Mars; as we know, ozone is somewhat toxic to life. In addition there is little probability that water exists in any biologically usable form on Mars. One estimate suggests that the partial pressure of any water, in all the possible forms in which it might exist on Mars, equals only about 0.043 g/cm^2. These two factors alone suggest great caution in predicting that life is present on Mars. Estimates of the energy required to obtain biologically usable water from the rocks suggest that temperatures as high as 538°C and up to 3704 kcal per liter of water would be needed. It is a little difficult to associate these demands with any reasonable speculation concerning life on Mars. One must not forget that ultraviolet radiation, a potent sterilizing agent, is not filtered out by the Martian atmosphere as it is on earth. Consequently one expects that the surface of Mars would be constantly exposed to the sterilizing effect of unfiltered radiation of solar origin.

There are a respectable number of responsible scientists who feel that there are critical and challenging problems right here on earth—problems which have every probability of being solved if sufficient energies and treasure can be expended on them. These problems need immediate attention; they should be supported with enormous sums of money. By the same token, some of us who have devoted our lives to science for a good number of years feel that the low degree of probability of finding life on Mars does not justify giving this effort a very high priority in our overall national scientific endeavor.

In this age, when the opinions of scientists are listened to with great respect by the general public, it is mandatory that scientists be extremely cautious in making statements and proposing programs. I think the committee's report is not characterized by appropriate caution. In my view it contains all too little science and entirely too much enthusiasm. It certainly does not represent a consensus or a majority opinion of American biologists.

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Population Control: Births, Deaths, and Statistical Inference

In his letter (14 May, p. 893) discussing Wynne-Edwards's article "Self-regulating systems in populations of animals," H. Frederiksen concludes that "the reduction in the birth rate appears to be a consequence of the reduction in the death rate," but this is only one of the possible interpretations of the correlations he describes. High correlation between crude or adjusted rates of natality and mortality could reflect common cause quite as easily as cause and effect. Moreover, a decline in the crude death rate must reduce the crude birth rate unless the absolute *number* of births increases.

Concerning the relation between the numbers of births and deaths, correlation between the rates may be totally uninformative. Even in the unlikely circumstance that all three variables—births, deaths, and population—were totally uncorrelated, there would usually be positive correlation between ratios formed by using any one as a denominator. If the coefficients of variation were comparable in size, this positive correlation would be moderately strong; and if the coefficients of variation of the numerators were smaller than that of the denominator, it might be very strong. A reduction in the death rate may be, as Frederiksen says, a "precursor" of a reduction in the birth rate, but in itself permits no inference about changes either in the numbers of births and deaths or in the population density.

If the number of deaths could be sharply reduced or eliminated without any change in the number of births, the birth rate would drop sharply but there would be a substantial *increase* in population density. If it were the birth and death rates that required food