which, according to him, "does offer promise of assistance to those who wish to predict future populations."

Unfortunately, politeness forbids us to respond to Shinbrot's remarks because this would involve him in a controversy which—in his own words—can only be on "a controversy among fools." Otherwise we would have pointed out our agreement with his feeling that it is unkind to perform a Dedekind cut on a man. On the other hand we could *not* write our differential equation in the form suggested by Shinbrot because we do not know of any integer-triple $N(n),N(n-1)$, and α_0, which would fit for $k \neq 1/i$ $(i=1,2,3....)$, his sugested difference equation. Obviously he must know such triples, and thus his suggested relationship will remain forever "Shinbrot's last theorem."

In the meantime, while we were displaying our wits and know-how in more or less learned discussions about the perennial question of how many angels can dance on a pin point, over ten million real people of flesh and bone, with hopes and desires, with sorrows and pain, have been added to our family of man. Our responsibility demands that we be ready with an answer when these millions ask for their right to live the span of their human condition in dignity.

Let us join forces so that we will not be caught in a dispute seen prophetically by Francesco de Goya y Lucientes: "Of what will they die?"

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References and Notes

1. B. Russell, *Human Knowledge* (Simon and Schuster, New York, 1948), p. 481.
2. For comparison of our Eq. 11 with estimates of the prehistoric human population, we are grateful to F. Meyer for having drawn our attention to his article "L'Accélération de l'evolution," in *L'Encyclopédie Française* (Larousse, Paris, 1959), vol. 20, p. 24.
3. E. V. Condon and H. Odishaw *Handbook of Physics* (McGraw-Hill, New York, 1958).

History of the Microscope

In Paul Klopsteg's article, "The indispensable tools of science" [*Science* **132**, 1913 (1960)], there are several statements on the historical aspects of microscopes and microscopical discoveries which are inaccurate. In the interest of keeping the historical record correct, I submit the following.

It is considered [see, for example, A. J. Kluyver's notes on Leeuwenhoek's letter to the Royal Society dated 9 October 1676, in *Collected Letters of Antoni van Leeuwenhoek*, Swets and Zeitlinger, Eds. (1939, 1941), vols.

1, 2] that bacteria were undoubtedly observed and described by Leeuwenhoek as early as 24 April 1676, and *not* 1681, as stated. Further, De Waard [see A. Schierbeek, *Measuring the Invisible World* (Abelard-Schuman, 1959)] has discovered that Zacharias Janssen was born in 1588, and his son Hans, in 1611, so that neither could have invented the compound microscope in 1590.

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Food Additives

The 27 May 1960 issue of *Science* [**131**, 1581 (1960)] gave editorial approval to the report of the Panel on Food Additives of the President's Science Advisory Committee. The principal recommendation of the panel was to set up an advisory board "to weigh evidence and make recommendations to the Secretary of the Department of Health, Education, and Welfare on the basis of available scientific data on applications for the approval of food additives." In evaluating this recommendation two facts should be considered. First, the panel probably would be under heavy pressure from corporations who would want exemption *now* for additives for which there is *some* evidence of carcinogenic effect in animals. Second, on the basis of present data and techniques, there is no way to make a reliable prediction of the "safe" level of a carcinogenic compound, and—to quote the report—"definitive answers useful in extrapolation to man may not be expected for many years to come."

While the report discusses a number of the major difficulties in the path of scientific decision-making in this area, there is one particular difficulty (which gets bare mention in the report) that we would like to stress here because it is often overlooked. This difficulty arises because (i) the population at risk is of the order of 10^8 persons; (ii) our primary emphasis is on controlling the *number* (rather than the proportion) of cancer cases; and (iii) direct estimates of the risk probabilities would be based on relatively small experiments (10 to 10^3 animals). Since we would be concerned if an agent produced, say, 100 cancer cases, a "safe" level would require risk probabilities of the order of 10^{-6}. Statistical theory indicates that to obtain adequate direct estimates of such small risk probabilities would require a sample of 10^6.

From this standpoint, consider the decision rule: If no cancers develop in 1000 test animals, classify the corresponding level of the agent as "safe."