Genetics and Soviet Science

The article on Lysenko by Caspari and Marshak (16 July, p. 275) offered little information which has not already been generally reported and generally believed. What bothers me is that they simply reinforce impressions which, while not wrong, are distorted by a lack of context.

1) To imply baldly that the failures of Soviet agriculture are due to Soviet rejection of Mendelian genetics is professionally immodest and only partly true. Are the tasteless and unattractive Soviet apples the fault of Lysenko? I doubt it. Rather, the apples lack the long history of plant breeding that Western apples enjoyed long before the first professional geneticist was hired to work on apples. (It may be recalled that Burbank was no geneticist.) Also, there has been no history of "agricultural extension" in the lands now composing the Soviet Union. For over a century in the United States, longer in England, there has been a serious organized effort to teach farmers to farm. The most casual perusal of eastern European publications (the Israel Program for Scientific Translations provides these in English) will show that an enormous number of them are devoted to primary problems of farming, which in the United States either have been solved or can be referred to efficient agencies for solution.

Other reasons for agricultural difficulties, such as the lack of mineral fertilizers, have been discussed in popular literature. Of course, the operation of a state or collective farm by people who have a very strong tradition of village farming is difficult. Nevertheless, some of these farms succeed. I visited a successful collective farm near Alma-Ata, Kazakstan. It was named for Michurian.

2) Caspari and Marshak do not differentiate between the intentions of state planning and the unpredictable product of human beings trying to operate a system. Yes, classical genetics was officially liquidated, and several geneticists (including at least one head of an All-Union scientific institute) were exterminated. Nevertheless, there was no general deterioration of Soviet science. Moreover, there was support for some fields which are starved in the United States. For example, a recent publication of the International Biological Project described the Soviet Union as "pre-eminent" in hydrobiology. In my own field of interest, soil algae, the Soviets have probably done more work than the rest of the world combined. Efforts which might have gone into genetics have not all gone to waste.

Marvelously enough, Soviet scientists (being human) are wily in twisting the system in their own directions and in finding the smallest cracks in the system to open new inquiries. In applying for support they can inflate "practical application" as ably as their American counterparts can. . . . My own observation was that a group of plant physiologists (under the acceptable banner of environmental control of development) were probing quite deeply into the mechanisms for control of development and perhaps uncovering flexibility which strong genetic determinists would not bother to seek. A more general conclusion about the capacity of the Soviet scientist to save his soul in his system was reached some time ago by A. Vucinich in *The Soviet Academy of Sciences* (Stanford Univ. Press, 1956).

3) Why has there been a revival of Mendelian genetics in the Soviet Union? I suggest that a good part of the reason has nothing to do with agriculture, but much to do with prestige. (Similar considerations are known to affect directions of research even in the United States.) The revival started under the protection of the prestige-conscious Soviet atomic energy commission—not the Academy of Sciences or the Ministry of Agriculture. I suspect that interest in genetics will increase as long as DNA is the holy trinity of science. . . .

4) Somehow the article disparages Soviet scientists, although by omission rather than by commission. If I am overly sensitive on the point, it is the result of having come to know a number of them as friends. To picture them as cogs in the central plan is a foolish underestimation; the implication that the mere provision of money and equipment will produce scientifically significant results (either in the U.S. or the U.S.S.R.) is debatable.

I can think of an old biologist the most distinguished man I have ever known) who served out his 10 to 15 years in exile and was allowed to go back to work. His studies are not

called genetics any more, but he otherwise remains unbowed.

I think, too, of the younger generation of biologists. Geneticists are among them, and they are known as geneticists in at least three institutes (to my personal knowledge). The younger generation is better and better trained, alert, imaginative, and unafraid. I found that they were well educated in the liberal arts, too, not through formal courses but because they had read and listened. Certainly they will begin to appear at genetic congresses—and elsewhere!

The authors failed to note that a volume on *Genetics and Selection of Microorganisms* was published in the Soviet Union in 1964—not earth-shaking perhaps, but indicative of scientific adeptness and speed.

HERMAN S. FOREST
19 Genesee Park Boulevard,
Rochester, New York 14611

Making the Scene

Have we stressed molecular biology too much? In a recent examination on evolution, I asked the students to "list the five epochs of the Tertiary Period." One answer I received was: "Pliocene, Miocene, Oligocene, Eocene, and *Cytosine*"!

JAMES H. CARLSON
Fairleigh Dickinson University,
Madison, New Jersey

More on Metrics: Clocks, Compasses, Music, and Milk Bottles

. . . We count by tens because we have ten fingers. But twelve is a much better base, and its advantages are so great that duodecimal currencies, weights, and measures have, I suppose, paralleled the decimal counting system throughout history. Even in France, where the metric system has been longest established, the duodecimal system still flourishes; for example a dozen is used there as it is with us, and eighty is expressed as "four score"; and the divisions of the circle, of the year, day, hour, and minute, once decimal, have reverted to the duodecimal system. Book sizes, time division in music, and the intervals of the diatonic scale, in fact the physiology of the sense of hearing, are all incorrigibly nondecimal. I suspect that a little reflection would produce many other similar instances.

It seems to me that the French and Russian revolutionaries missed their greatest opportunity to improve the world: rather than adopting the minor improvement of a decimal system of weights and measures, they could have made a major improvement by adopting the duodecimal system of counting, and a consistent compatible system of weights and measures. . . .

S. T. FISHER
53 Morrison Avenue,
Mount Royal, Montreal 16

. . . Great numbers of persons are already using the metric system in the U.S., and conversion will be of importance to the scientist. But we have to realize that the whole population of the U.S. is not scientists, and the common man has always been very reluctant to change the units he is used to. In many countries the metric system was enforced by law, and there were fines and prison sentences for those not accepting it. To illustrate the slowness of change, I may cite an experience of our engineering firm. Here in Madrid, 100 years after Spain's adoption of the metric system, in a design project for a new highway the prices of the land were given to us for our counterpart of acres and square feet (which are different from the British and different even from those of other Spanish regions). Of course in our plans we have used metric units. . . .

To gain mass support for a conversion, I have proposed a metricized British system [M. Mateos, *Mech. Eng.* **85**, 50 (1963)]. In this system, by making the quart and the pound slightly bigger we could have 1 metric quart (1 m-quart) = 1 liter, and 1 metric pound (1 m-pound) = ½ kilogram; and by making the inch a bit shorter, 1 metric inch (1 m-inch) = 25 millimeters. This change should be made in stages over a period of at least 10 years. It could be done first as a trial by one big industry —for instance the milk or gasoline industry—in order to appraise the results.

MANUEL MATEOS
Torán y Compañía,
Apartado 14432,
Madrid, Spain