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AMERICAN ASSOCIATION for the ADVANCEMENT OF SCIENCE 1515 Massachusetts Avenue, N.W. Washington, D. C. 20005 ance as well. Jefferson advocated public higher education for those who had the "interest, competence, and *character*," to profit from it—a standard closely tied to his view of public service. While qualities of intellect may be easier to judge than qualities of character, both judgments are essential to the determination of merit.

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### Green Revolution: Just or Unjust?

Nicholas Wade's report on highyielding varieties of rice and wheat "Green revolution (I): A just technology, often unjust in use" (News and Comment, 20 Dec. 1974, p. 1093), while it can hardly be called biased, can't be called balanced either. I suppose every one of the thousands of new technological innovations in agriculture that have occurred since man emerged from his hunting status in the forest has tended to favor those who already have in hand the most capital to make the innovations. To argue on these grounds that the innovations should not be made leads to the absurd conclusion that Homo sapiens should never have evolved, for technological innovation is what distinguishes man as a species.

Of course the distribution of income is a major problem. But perhaps social scientists need to give more attention to solving that problem and less to lamenting the social-justice consequences of increasing productivity. The problem has been around a long time; it's not unique to the green revolution. I haven't run a poll, but I doubt if very many economists would agree that the green revolution is bad.

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### U.S. Grain Production

Although I am not a vegetarian, it seems to me that the crux of the problem of protein production is in the growing taste of the affluent nations for meat (U.S. annual meat consumption increased from 55 to 115 pounds

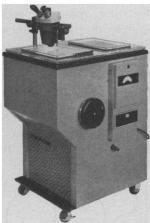
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per person between 1940 and 1970), rather than where Horst Kehl (Letters, 31 Jan., p. 299) puts it. His whole argument that the amount of grain grown on an acre of land will feed more cattle than an acre of grass is irrelevant, since proponents of cutting down on feedlots are advocating that this grain be used for people, not that it be replaced by grass. Cattle would be grazed on nonarable land, and if this implies a somewhat reduced meat production, public education as to health needs would help reduce the demand. That raising cattle on grass "would result in . . . animal protein that would be of poorer quality" is an ambiguous statement. The nutritional quality of the protein would not be changed; the meat would have a higher percentage of protein and a lower percentage of saturated fats.

I doubt the validity of the statement that "agriculture in the United States has proved to be the most efficient in the world." Britain and Japan have higher yields of cereal grain per acre, and if we consider the amount of energy expended, we are very inefficient (1). Attempts should not be made to implant U.S. agricultural methods throughout the world. Some of the real failures in connection with the green revolution occurred where the need for labor-intensive farming with the right expertise and equipment was overlooked.

It is a plain fact that humans certainly can obtain the amino acids they need by very simple combinations of cereals and legumes. As to the affirmation "[o]nly by producing sufficient animal protein can the world standard of living be raised and adequate nutrition supplied," if all people consumed a diet similar to that of present-day Americans, world food production would have to be increased almost eight times. If a reduced consumption of meat in countries such as the United States reverted grain to nations in need, it would serve to improve the nutritional status of these populations. Paradoxically, it would serve also to improve the health of Americans by lessening a diet factor which is probably conducive to heart disease.

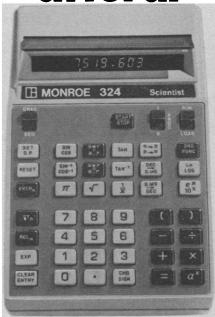
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