

# To the Editor

## Food from the sea

Dear Sir: Having been involved for several years in the development of methods for producing fish protein concentrate, I was particularly interested in two items on the schedule for the recent AAAS meeting held in Washington. These were the symposium on World Food Supply and the panel discussion of U.S. Policy on Food and the World's Future. Organizers of both of these meetings included representatives of the Department of Agriculture, the Agency for International Development, universities and private industry. Since I was unable to attend these meetings, I read with great interest the reports which appeared in the Jan. 6 issue of SCIENCE (pps. 56-58) and the Jan. 7 issue of SCIENCE NEWS (p. 18).

In SCIENCE, Lester R. Brown, administrator of the International Agricultural Development Service of the USDA is reported to have "held out little hope that increases in food supplies through the expansion and improvement of conventional farming will be sufficient" to provide enough food for the expanding population of the world. On the other hand, Assistant Secretary of Agricul-

ture Dorothy A. Jacobson is reported by SCIENCE NEWS as stating that "USDA studies showed that the best way to feed these people was by improving local agricultural practices to the point where the community could not only take care of its own nutritional needs but have sufficient surplus to sell in neighboring cities."

SCIENCE NEWS further reports that "AID's Assistant Administrator, Herbert J. Waters, told the AAAS meeting that AID is giving 'highest priority' in its overall program to the problem of helping other nations provide themselves with sufficient food to feed their burgeoning populations." SCIENCE, however, reports that in a lengthy discussion of the development and use of high-lysine corn and wheat and cereal grains fortified with synthetic amino acids, serious discussion was given to "controlled" feeding experiments" in which "statistics might be collected on comparative death rates among children" with and without lysine-fortified wheat in their diets!

SCIENCE reports that the use of pro-  
(Turn to p. 156)

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# SCIENCE NEWS

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## . . . To the Editor

tein from oil-seeds was discussed and of course the example of Incaparina was mentioned. The use of soy protein to make simulated meat products was also discussed, and indeed ". . . some of them may be marketed for as little as 20 cents a pound." And, of course, "exotic . . . high protein foods" were mentioned, "including a process for producing quality protein high-purity hydrocarbons. . . ."

I suppose it is obvious that I was disturbed by the contradictions in these various views which were apparently not noted by the reporters, and I fail to understand the excitement generated by the experiments on growth of bacteria on petroleum products, which is, after all, production of plant protein from a limited resource (high-purity hydrocarbons?). But basically I am disturbed by the continuing emphasis on agricultural solutions to animal protein deficiency problems, and what I find incomprehensible is that no mention was made of the potential productivity of the seas, the one presently existing source of desperately needed animal protein, large enough in extent to supply all the needs of perhaps 10 times the present world population, and waiting only to be harvested and utilized. While there is variation in estimates of the potential sustainable harvest of edible fish, there is substantial reason to believe that it is anywhere from 500 million metric tons annually to 2 billion metric tons. This means an estimated annual harvest 10 to 40 times as great as the 54 million metric tons harvested in 1964, and even these figures do not take into account the possible increase in production of fish when fish farming techniques are eventually used.

When these amounts are translated into protein, the implications are staggering. If this harvest could be realized and converted into fish protein concentrate, for instance by the process we have been using at the Bureau of Commercial Fisheries, it could supply the entire daily "high quality" protein needs of 5.5 billion to 22 billion people, based on an estimate of 30 grams a day. Using a more realistic figure of 20 grams of animal protein a day as a protein supplement, we find the seas could provide this protein supplement for 8.2 billion to 33 billion people every day of the year.

Norman L. Brown  
Washington, D.C.

(Mr. Brown is a physical chemist associated with the Bureau of Commercial Fisheries' fish protein concentrate development program.) (SN:2/11; p. 138)