

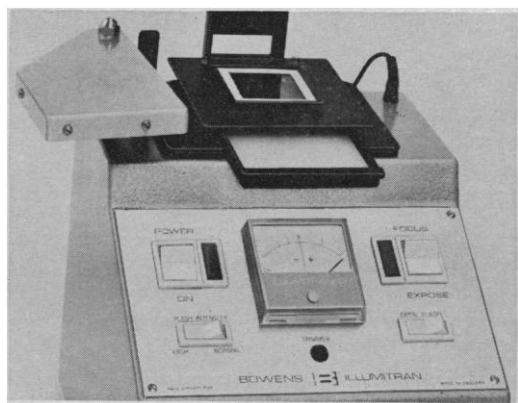
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rine advisory service through the National Sea Grant Program and its other component organizations. This program was inaugurated by NSF years ago under PL 89-688 and is providing the same services to the marine community as the "environmental extension system" recommended by Hersman. There are now 28 separate marine advisory programs located in the 30 coastal and Great Lakes states. These programs are concentrating on fisheries, coastal zone development, recreation, and marine science education.

HOWARD H. ECKLES
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Deepwater Illumination

I wish to propose a means of creating a captive marine ecology that might prove of benefit in mariculture. Light at intensities sufficient to permit photosynthesis could be introduced into circumscribed regions in the ocean at depths at which such light intensities are normally not found. Such an experiment could be conducted with submerged banks of lights turned on and off in a circadian rhythm. However, for long-term study another method could be used in which no expenditure of electric power is needed. Towers that are either hollow or made of material more transparent than seawater could be built in coastal waters to reach to depths of 100 to 300 meters. Sunlight could then be transmitted directly into the deeper waters. The algal growth and its dependent fauna that would be made possible by such illumination would be truly captive, in that the conditions of pressure, temperature, and light intensity necessary for this ecology would exist only in the immediate vicinity of the tower, and harvesting would be greatly facilitated.

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"Miracle" Sorghum

As one who has some acquaintance with growers of sorghum and millet in the savanna regions of East Africa, I would like to comment on Deborah

Shapley's report "Sorghum: 'Miracle' grain for the world protein shortage" (12 Oct. 1973, p. 147). The report suggests that the development of new high-protein strains of sorghum will aid the poor in less developed countries—principally Africans, East Asians, and Indians—who have been bypassed by the green revolution. This suggestion rests on several untenable assumptions insofar as it relates to the Africans I know. First, the people described as "poor" are not necessarily poor in their own eyes. What, then, does it mean to say that the new sorghums will help them? Are we planning to force them to grow "miracle" sorghum for their own good? The second assumption is that these people will desire to grow the new grains because they are hungry. This is nonsense. These Africans make decisions about growing new crops on the basis of the economic context in which they live. In the 1950's, the Nyaturu of Tanzania generally refused to cooperate with government plans for the construction of storage silos for bulrush millet. The plans were designed to alleviate the stress of periodic droughts, but the Nyaturu thought that storing the millet would threaten their basic economy—they exchanged grain for livestock in order to achieve wealth, and the periodic droughts appeared to them to increase the frequency of exchange.

The claim that the high-protein content of the new sorghum will alleviate kwashiorkor is particularly strange, since so many of the sorghum growers also raise livestock and consume more meat than other Africans do.

Isn't it about time that the brilliant technical expertise which has led to such dramatic improvements in crops is combined with a more sophisticated understanding of the non-Western economies they are meant to serve? Most particularly, shouldn't we explore the possibility that when the emergency conditions which bring hunger are not present, the people in less developed countries evaluate new crops, as we do, on the basis of such considerations as opportunity cost, marketability, and relevance to their society? American farmers don't grow hybrid corn just because it gives better yields or is nutritionally more adequate. Africans will also evaluate new plants on more complex economic grounds.

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