made to introduce Crambe into the United States as a source of protein. Some of these species, however, contain toxic materials and careful testing is essential. Finally, strains of normal plants with a particularly favourable amino-acid composition may be developed. There is some evidence that certain strains of groundnut are twice as rich in lysine as other strains. Dr Woodham concluded that the short-term answer to the world protein shortage will lie in the development and better utilization of plant proteins, although other sources of protein may become more important later.

Some of the economic and production problems were discussed by Dr G. B. Galliver (Unilever Research Laboratory, Sharnbrook), who said that because purified protein is odourless, tasteless and without apparent attraction to the consumer, it is not surprising that it is not readily accepted as an addition to the diet. To make better use of protein foods, advertising will be necessary to stress the nature, source and value of the protein and to ensure that the products are actively sought and consumed. It is necessary to sell the product as a food and, above all, to avoid any suggestion that it is only for the poorer people, thus leading to the belief that the product is inferior. It is also necessary to establish the supply of raw material on a sound footing and to carry out "pilot-plant" production of the material close to its potential market to eliminate any problems before large-scale production is attempted. This point was echoed by Mr J. C. McKenzie (Office of Health Economics), who was "confident that within ten years, perhaps even less, we shall know how to persuade people to change their food habits".

WATER RESOURCES

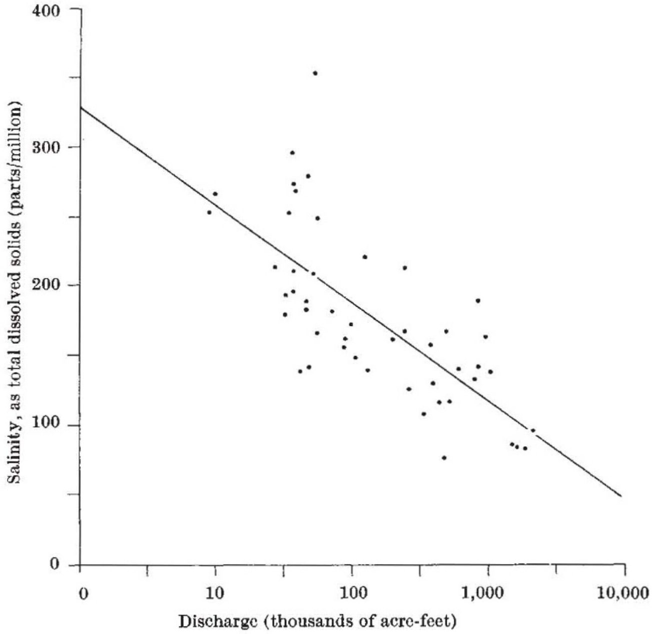
Salinity in the River Murray

from a Correspondent

THE quality of water in a river is always affected by factors such as the proportion of salts dissolved from the rocks of the catchment, the proportion of salt in the rain water, and the effects of evaporation in concentrating soluble matter. In the case of the River Murray in South Australia three factors are particularly important.

First, the average annual potential evaporation exceeds 60 inches over much of the area and increases the concentration of dissolved salts in bodies of surface water. Second, although the flow of the Murray is progressively more and more regulated, it varies considerably about the average annual discharge of 19,176,000 acre-feet. The possibility of extremely small flows is important because salinity usually increases as discharge decreases. Third, the inflow of very saline water from various sources increases the salinity of Murray water[1]. Some of this comes from saline springs and seepages in the banks and bed of the river, though more important is the uncontrolled disposal of highly saline drainage water (which can contain up to 20,000 p.p.m. total soluble salts) from a number of the irrigation schemes along the Murray Valley.

This combination of factors has produced a definite trend towards greater salinity throughout the Murray, apart from the general downstream increase in salinity, which is even more marked when river flow is low[2]. As long as South Australia receives the flow to which it is entitled under the River Murray Waters Agreement, water quality remains satisfactory[3]. In spite of the regulation of the river, however, there are periods of very low river flow—as experienced in 1965 and 1967–68—which are the more serious because low river flows are invariably associated with high salinity. In a catchment where drought is a recurring problem, the regularity of flow can only be improved by the construction of water storages. The chief function of the now deferred Chowilla Dam was to provide further storage capacity and greater regulation of the Murray's flow in South Australia[4]. But the establishment of a very large reservoir in an area where evaporation is so high could only result in an overall increase in the salinity of the water stored.



Salinity and discharge at Lock 9, River Murray, for monthly observations, July 1963 to June 1967. The correlation coefficient is $-0{\cdot}717$, significant at the 0·001 level. The regression equation is $y=326{\cdot}876-69{\cdot}556x$. Based on data provided by the River Murray Commission, Canberra.

In five of the past ten years the River Murray has provided more than 40 per cent of South Australia's domestic water consumption. Far more, however, is used for irrigation, particularly of horticultural products, many of which are classed as "extremely sensitive" to total salinity[5]. The estimated loss of horticultural production in South Australia exceeding $A2·5 million per annum as a result of saline irrigation water is not surprising and is probably an underestimate. More storage schemes are essential to guarantee South Australia's share of Murray water. But if the result is an overall increase in salinity there will have to be major changes in the whole concept of irrigation in the South Australian Murray Valley.

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3 *South Australian Parliamentary Debates*, Legislative Council (August 23, 1966).
4 Crabb, P., *Australian Geographer*, **10**, 309 (1967).
5 Allison, L. E., *Advances in Agronomy*, **16**, 139 (1964).