Pop + Food

INTER-OFFICE CORRESPONDENCE

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Pop
Agric.

FROM: WFL

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TO:

WW	NOV 22 '49	WW

COMMENTS: 915 Pop Population

SUBJECT: WFL Notes on "World Population and World Food Supplies."

This article by Sir John Russell, President of the British Association, reported in <u>Nature</u>, September 3, 1949, would seem to be a most excellent summary of the world population versus world food production problem. Sir John does not take up the present diets in different parts of the world from a caloric point of view, but instead focuses on the main methods of increasing food production in two main categories:

1. Extensional increases.

2. Intensional increases.

He gives an interesting historical insight by showing that fifty years ago (1898) Sir William Crookes, then President of the British Association, startled the world by declaring that by the 1930's the world would suffer hunger unless agricultural yields were raised and powerfully advocated the introduction of nitrogenous fertilizers. When the 1930's came in fact no such dire predictions had actually arisen and an opposite picture held. For the glut in wheat production for example was so great that relief measures became necessary and in the Argentine wheat was burning the locomotives instead of coal. True, nitrogen replacement had become a major industry but also the unforeseen development of plant genetics (drought and frost resistant varieties, etc.) had changed the picture completely.

It is interesting to note that this serious article on food problems originated in England, of all countries, which, along with Belgium, is probably most conscious of not supporting itself agriculturally. Similar problems of course exist in Egypt, India and Southeastern Asia, which he points out cannot balance the picture as England can "by importation in return for manufactured goods, but must rely on intensification of present agricultural methods. He also accents the interesting facts that whereas approximately one in four Europeans are farmers, in Asia nearly two-thirds of the population are engaged in agriculture and yet can only survive by the far more efficient if less tasty method of being vegetarians.

Sir John makes the following interesting breakdown of the problem:

100% total world acreage receiving sunlight (roughly 100,000 million acres)

33% land area (35,700 million acres)

11% climatically suited area (11,000 million acres)

3.3% acreage actually cultivated (3,500 million acres)

3% area used for food production as against industry production (3,000 million acres)

Thus, 3% only of the world is used for converting sunlight into food, a conversion process that he says is less than 5% efficient. Thus he suggests that the over-all efficiency of our tapping incoming solar energy through present agricultural methods is only 3% x 5% of 0.15%.

Obviously this wastage of 99.85% of the incoming solar radiation could be increased:

A. Increasing the efficiency of photosynthesis such as described in the algae-pond method.

B. Utilizing the climatically suitable ocean areas for agriculture.

C. By dry-ice and other methods of climate control, utilizing some of the 24,700 million acres of land not presently suitable for agriculture because of climatic reasons.

D. By diagnosing the causes (such as zinc, copper, molybdenum, etc., defficiency) responsible for our not presently using the 7,500 million acres of climatically useful land.

After the extensional analysis such as given above (which has been somewhat recast by WFL) he takes up the intensional methods of increasing agricultural production. These he lists as:

A. Anti-erosion, where he points admiringly to the United States Conservation Service with its program in the "Dust Bowl" states, that is, Oklahoma, Kansas, Texas, and the T.V.A., etc., as well as quoting General Smuts' dictum that soil erosion in Africa transcends all political problems.

B. Fertilizing methods. He describes Professor Pearsall's findings concerning the oxidation-reduction potential in water-logged soils: oxidation taking place in the soil-water surface, but reduction lower down, and mentions the immediate use of the Japanese experts in using this "pure science discovery" and effectively increasing the yields of rice paddies. He mentions, incidentally, that no fertilizer shortages are likely to occur for thousands of years, that is, nitrogen, phosphate and potash, etc.

C. Weed control. Obviously any sunlight-erosion control, fertilizers, water table conservation methods, etc, etc, that end up in the increasing production of weeds robs the whole process of efficiency in so doing. Newer

methods of weed control such as 2 : 4 D are of great interest here.

D. Storage problems. The storage of the vast wheat surplus presently existing is obviously one of anti-insect and anti-vermin control. Chemicals such as D.D.T. are being used in attacking this problem.

E. Other scientific advances in food production. Russell briefly mentions the synthesizing powers of yeast to make fat, protein, etc., such as reported by Spoehr, as well as other new work connected with auxins, hormone treatment of milk producing cows, artificial insemination, etc.

F. Administrative methods. He makes the important point that much of the problem is not only scientific in nature but also administrative, citing the practical methods of the United States Conservation Service in erosion control in the Western states, where farmers apparently are effectively cooperating with the government. He points to Asia as a particularly difficult area in which to work because of the low standards of education and concepts of progress, etc. Indeed, he makes a good case for the point of view that what is needed for increased food production is added extension of what may be called the industrial revolution of agriculture, whereby agricultural personnel are taken off the land and put to work in factories to make farm machinery, as presently occurring in America.

SUMMARY: This would seem to be a first-class article on the food production aspects of the world population problem.