

population trend and policy are moderate in spite of the limitation of the official data. Modernization of the Japanese population structure was analyzed in Chapter 4 by Thomas O. Willkinson focussing on the aspect of urbanization which accompanied industrialization. He places stress on the role played by induced abortion in the lowering of fertility and on rapid economic development as its background. The point in which the reviewer is especially interested is whether or not the Japanese experience is suggestive to other Asian countries. A future task for students in this field will be comparative, in depth studies concerning this question.

Indonesian population problems (Chapter 5, by Everett D. Hawkins) are focused on the possibility of transmigration in order to cope with the excessive concentration of population on Java. Pakistani population problems (Chapter 6, by Anwar Iqbal Querishi) are treated in the context of food and family planning programs. A racial analysis of Malayan population problems is made in Chapter 7 by J. C. Caldwell. Taiwan's achievement in lowering fertility is favorably noted but doubts are entertained concerning the results of a public poll which was carried out employing a method which seemed appropriate to advanced countries (Chapter 8, by William Petersen). The last three chapters are devoted to an analysis of Australian population and a discussion of population problems, immigration policy in particular. Although the role of international migration in solving population problems has become relatively small as compared with the past, its importance cannot simply be ignored. Criticism of and proposals for the so-called White Australian Policy are persuasive.

As is clear from the above, the appearance and nature of the population problems of each Asian country differ as determined by their own social, economic and cultural environment. However, population increase as a result of an abrupt decline in mortality becomes a serious problem for every Asian country as has appeared in the process of development.

This book is a result of the International Seminar on Asian Population Problems, held in Melbourne in 1963, which was the first attempt to grasp Asia's population problems in their entirety. It will be especially valuable to publish a supplementary volume in which the Asian countries not involved here will be treated. With these two books it would become possible to conduct comparative studies between countries whose socio-economic conditions are comparatively alike and for research in the field to progress further. (Haruo Sagaza)

*Seeds of Change: The Green Revolution and Development in the 1970's* by Lester R. Brown, New York, Praeger Publishers, 1970, xv+205 pp.

The author, well-known as a specialist on the world food problem, has expanded and supplemented into book form his article "The Agricultural Revolution in Asia," *Foreign Affairs*, July 1968, an article which attracted considerable public attention. The book is the first in which a single author has attempted an over-all study of the "Green Revolution," the latest agricultural topic in developing countries. (For the record, U.S. House of Representatives, Committee of Foreign Affairs, *Symposium on Science and Policy: The Green Revolution*, U.S. Government Printing Office, 1970.) So that the book may be easily understood by people concerned with aid programs in developing countries. It is written in plain language. Perhaps because of this, both analyses of some points at issue and the development of argumentation are not

completely thorough. Moreover, certain false understandings of a few detailed facts could be pointed out. However, in spite of such rather minor shortcomings, the book is very useful in obtaining a general picture of the "Green Revolution" and the current trends in cereal production in developing countries of the world, particularly in Asia, as well as offering insights into the economic and social implications of this revolution. The book could also be recommended to academic researchers as a good and instructive source for an understanding of the way in which Americans—a major promoter of these new trends—view and deal with them.

The author views the Green Revolution as follows. The pattern of increased cereal production in developing countries was established in the 1960s through the development and extensive application of high-yielding seeds, representative examples of which are "miracle rice" and "Mexican dwarf wheats." (He terms this process "the production breakthrough.") Such production breakthrough has not only brought about many "second generation" problems, but also exposed to the light many important problems which had hitherto lain concealed in the shadow of the food problem. (Analysis of this aspect is not completely thorough.) The nature of these problems is such that they cannot be solved technically either by farmers themselves or by scientists, but as they are of a political nature, their solution rests mainly on the shoulders of politicians, in developing, as well as advanced, countries. The success of the Green Revolution depends primarily on how these problems are dealt with, and herein lies the great task for the world community in the 1970s.

The author contends that the production breakthrough was made in the 1960s for the following two reasons. First, the successful development of high-yielding seeds, together with irrigation strategies, mainly in the sphere of small-scale irrigation, has been chiefly instrumental in bringing about the yield take-off of wheat and rice. The other is that the continuing development of such new seeds and related modern technologies, as well as the transfer of these technologically improved practices beyond national boundaries, has been institutionalized, through the building-up of a global research network centering around private foundations and through the activities of multinational agribusiness corporations, whose activities have become particularly remarkable since the mid-sixties. Of course, there has also been the aid program extended to developing countries by the Government of the United States. As a successful example of the United States foreign aid program, the author regards the Green Revolution almost comparable to that of the Marshall Plan.

As "second generation" problems, the author lists the following:

- (1) social instability in connection with the distribution of benefits accruing from the increase in cereal production—that is, the conflict of interests between landlords, tenant farmers and farm laborers, between rich farmers and poor ones, between regions, between urban areas and rural districts, and between farmers and agribusiness operators,
- (2) overloaded marketing systems,
- (3) the threat of plant diseases,
- (4) resistance of consumers' taste to new varieties,
- (5) increase in foreign exchange burdens as a result of the termination of food aid programs, (developing countries are compelled to import, on a commercial basis, fertilizers, insecticides and other agricultural chemicals, as well as various equipment and materials for agricultural production, in place of food aid),
- (6) credit facilities to small farms,
- (7) the problem of market availability for increased output, as well as difficulties

caused by the drop in prices for cereals.

In addition, the author lists the following as new problems which may emerge as a result of the agricultural breakthrough:

- (1) increase in the flow of population into cities as a result of inappropriate farm mechanization,
- (2) rising pressures for agricultural reform,
- (3) shift in emphasis from the population-food problem to the population-employment problem,
- (4) shift in emphasis from caloric hunger to protein hunger.

The author believes that the effectiveness with which the governments of developing and advanced countries tackle these various problems will determine the future of agriculture in developing countries in the 1970s. What he emphasizes above all is the revision of agricultural protectionism of European countries and Japan. Particularly he asserts that the Japanese market should be opened up for the surplus rice of Asia, casting a sharply critical eye upon Japan's attitude.

On the whole, this book is colored strongly by the American outlook. This, it is believed, has caused biases in evaluation and some mistakes in the understanding of certain facts. Some examples of these points are cited as follows.

In the first place, we could question the author's view that the breakthrough in cereal production in developing countries was completed in the 1960s. For, while he includes the threat of plant diseases and the resistance of consumers' taste to new varieties (problems which remain unsolved) in the "second generation" problems, these should be included in the "first generation" problems, as they are directly concerned with the nature of the "breakthrough." Moreover, we still have some doubts on the continuance of increased cereal production, a point which will be taken up again later.

In the second place, the author thinks that the process of development and extensive application of new seeds and related technological practices has become an integral part of the agriculture systems in underdeveloped countries, having been institutionalized through the activities of private foundations and multinational agribusiness corporations and being essentially not a "one-shot" affair. However, this view is open to question. For, in my opinion, a production breakthrough can be institutionalized and a yield take-off in the real sense can be initiated, only when a developing country, as for instance in the case of the Republic of China (Taiwan), has acquired the ability to develop and spread new varieties by its own efforts. Otherwise, development will be likely to cease with the termination of foreign aid.

Further, full consideration has not been paid to the force of nationalism. For example, the author is correct in asserting that the extensive application and wide adoption of new rice seeds in Asia owes a great deal to the activities of the IRRI (International Rice Research Institute). But it should not be overlooked that nationalism in recipient countries has played no small part in this process. In Indonesia, people like the IR-8 and IR-5 varieties and are eager to adopt them, because these are the ones produced by a hybridization with their native variety *Peta*—a variety of which they are very fond. In Malaysia, farmers show a marked preference for IR-5, because this is the improved variety developed by a cross with their own *Tangkai Rotan*, as one parent; they have also developed by their own efforts a sister variety *Bahagia* and are active in promoting its spread. Moreover, though it is true that one of the reasons for the recent and rapid development of new varieties through self-help efforts in Asian countries is, as the author points out, that the varieties developed at the IRRI are a great help in conducting rice breeding work, it should not be overlooked that

the nationalist desire of Asian countries "not to be beaten by the United States" has also provided a great stimulus. Likewise, I believe that the author should have paid due consideration to the force of nationalism both in the Republic of China (Taiwan), where the varieties *Taichun Native 1* and *Deo-geo-woo-gen* have been developed, and in Japan, which has made scientific contributions to the development of new varieties of rice and wheat.

Finally, I would like to point out the following as examples of the author's misunderstanding of certain facts.

(1) In the development of new varieties of rice and wheat, agricultural sciences and breeding techniques in Japan have made considerable contributions. The new improved varieties of both rice and wheat have common characteristics of short, stiff straws, slender and erect leaves, and early maturity, characteristics which reveal that Japan's science and technology have been adequately made use of in breeding work. Naturally, the degree of Japan's contribution is greater for rice, than for wheat. Furthermore, Japanese scientists and technicians took part in the experimental work at IRRI. In spite of these various contributions, the author mentions only the contribution of the Japanese variety *Norin 10* to the breeding of new wheat varieties, and does not even refer to Japan's contribution to the breeding of improved rice varieties.

(2) The author contends that road construction has made a great contribution to agricultural development and cited as an example the Friendship Highway in Thailand, constructed with the assistance of the United States. He evaluates the contribution made by this Highway to the development of maize crop in Thailand very highly. But this evidence can hardly be said to apply. For the main maize producing areas in Thailand are not situated in North-eastern Thailand, through which the Highway passes, but are rather located in the north-eastern and northern parts of the Central Thailand, where other roads, canals and rivers serve as means of transportation.

(3) When considering why the Green Revolution, which started in Mexico, has spread not to Latin America but rather to Asia, the author views the large-scale land ownership system of Latin America as responsible. However, the author overlooks the fact that India, Pakistan and the Philippines (the first countries in Asia to show signs of the Green Revolution), are countries where similar land ownership systems have been well and firmly established, and where no effective land reforms, if any, have been carried out. The relationship between the systems of land ownership and the Green Revolution must be both theoretically and substantively re-examined.

(4) The author is extremely critical of the agricultural protectionism of European countries and of Japan (though he criticizes the protectionism adopted by the United States only in the field of sugar). The author appeals to Japan to dismantle her protectionist measures in regard to rice and to resume rice imports from Asian countries, as he sees these measures as absolutely necessary for the success of the Green Revolution in rice producing areas of Asia. Here he overlooks the fact that, to the Japanese consumer, the Japonica-type rice and the Indica-type rice are altogether different in quality—so substantially different in taste that one might say that they are entirely separate commodities. I, too, am in favor of revision of agricultural protectionism (naturally, the United States could not be an exception), but it should be born in mind that the rice varieties produced in Asia under the Green Revolution cannot replace Japanese rice in the Japanese diet.

(Kazuo Saitō)