

EXTRACTS.

World Production and Trade in Rice.

In the general report on cereal cultivation presented by Prof. Brizi to the XIIIth International Congress of Agriculture held at Rome in 1927 it is stated that the world production of rice *possibly* amounts to 1,300,000,000 quintals. The aggregate figure cannot be stated precisely as there is no registration of statistics in the case of several countries including China. One authority calculates the world production at 1,600,000,000 quintals.

The following figures may be given of the area cultivated in rice and of the production for the year 1926-27, the data being however incomplete in respect of the Asiatic countries: area 54 million hectares, production, 846 million quintals.

These figures may be compared with those of the production of wheat, which in 1925-26 was 1,059,200,000 quintals.

The technicians and economists who have made a special study of the subject of rice from the world economic point of view state that this question, in common with the general question of cereals, forms part of the whole problem of foodstuffs and scarcity, and therefore is to be included in the examination of the means of meeting the world food crisis.

It should be noted that the importance of rice in Europe does not consist solely in its direct consumption as food. A considerable part of the production is employed as raw material in certain industries; but in whatever way this cereal is prepared or transformed whether for human food or for industrial purposes, there are always residues which are of value for feeding or fattening stock. Hence those countries which import and use in industry large quantities of rice tend to accumulate large quantities of stock feeds which become transformed into meat, milk, or fertilising material. For example,

Germany, a non rice producing country, was before the war much ahead of other European nations where rice is grown, and imported and exported this cereal on a large scale using it as an element in a large number of industries.

Generally speaking the technicians and students of public health questions recognise in the first instance that the preparation of foreign rice is an important source of wealth for Europe, and that on this account the importation of Indian and Asiatic rice would promote the solution of the food crisis, besides stimulating labour and trade, but they maintain further that it would be of great advantage to extend rice-growing in Europe. The arguments are: that rice forms in Asia the staple food of the whole population; that its world production is already by far the most widely diffused of all the cereals, and could moreover be considerably further extended by making use of marsh lands or lands capable of a high degree of irrigation; that contrary to the opinion formerly held the rice crop, if carried on by improved methods far from encouraging malaria is a crop that tends to improve swampy and unhealthy lands which have been on this account left waste and uninhabited; that rice, even where as a branch of farming the production is in excess of the demand, is always a safe and remunerative export commodity. Certain legal authorities add that the legislation restricting rice growing in certain countries is no longer in harmony with the progress of scientific knowledge about malaria, nor with the principles of political economy, and that unwise restrictions due to antiquated beliefs and long standing opinions must give way to measures calculated to promote the cultivation of rice and to encourage trade in rice, if this crop can really make fertile lands either lying waste or only partly cultivated, and this can promote the development of home colonisation.

It may be remarked, moreover, that agricultural civilisation in S. E. Asia is based primarily on this cultivation, and in comparison with wheat growing the following characteristics are to be observed. Where rice is grown, the crop rotations are more rapid and more intensive. As rice growing develops, it absorbs a larger quantity of labour. The labour in fact accounts for half the cost of cultivation, but the economic advantage of this inevitably diminishes,

since the cost of irrigation and fertilising increases, and thus arises the necessity of introducing into the rotation, or substituting, other more remunerative crops, so as to keep the worker employed, and to attach him to the farm and the land. Thus as a result of the formation of rice fields in swampy and deserted localities, in the long run there is effected coordination of productive farming, more scientific distribution of the land among the various types of cultivation, the most appropriate crop rotation, and the satisfactory line of progress for the rural population and for the rise of rural industries. On the other hand it is to be also noted: that varieties of rice grown intensively tend to deteriorate, and it is important to introduce exotic varieties and at the same time so to direct the selection as to restore or improve the original characteristics. Research workers on the spot direct the choice of varieties suitable for export and acclimatisation, and it is essential to maintain for the purpose permanent mutual understandings between the producing countries so as to facilitate periodical and systematic importation and acclimatisation of approved varieties as opportunities offer for the development of trade between distant countries and for the formation of links of interdependence and solidarity between rice growing countries, while it becomes possible to check unfair competition.

As a rule in proportion as the area devoted to wheat cultivation is extended in a given geographical region, statistics show that there is a reduction in unit yield per hectare. Speaking generally, that is to say, a country with a fairly considerable population has a small percentage of lands so fertile and so particularly adapted to wheat as to give the maximum yields.

In Japan the general position of the problem of rice cultivation is in fact the problem of associating another food crop with rice.

During the war it was recognised in Japan that it was essential to secure independence as to the food supply and attempts were made to induce the population to adopt some substitute for rice. It was realised that to maintain the feeding of the nation on the rice basis, it would be necessary, as the population increased, to extend

the crop to arable land already used for other crops and less suitable for rice, a policy neither advantageous, nor practicable. If on the other hand it were possible to reduce the national consumption of rice and to combine it with that of another cereal, the problem of supplies and of the national independent food supply of Japan would be capable of solution even in view of an increase in the population and the increase in rice consumption.

It may be noted that the value of the rice production alone in Japan is equal to 60 per cent. of the total value of the agricultural production of foodstuffs, and that while there is a small export of rice there is a considerable importation on the part of the Japanese colonies. The food situation of the country thus essentially depends on the rice supply. The deficiency in the Japanese production of rice as compared with the total consumption, has gone on increasing from 1893 onwards, in spite of the extension of rice growing on improved lands and the augmentation of the average yield of the rice fields. The difference is met by imports.

It may be added that in Japan the consumption of rice has always been higher than the production; hence the position is the exact opposite of that of Italy and other European countries which are producers and exporters of rice, Japanese consumption is increasing by two-thirds in proportion to the increase in the population and by one-third in respect of the average consumption per inhabitant. The index of the consumption per inhabitant has risen from 100 in 1888-92 to 149 in 1913-17, while in the same period the index number of the population has risen from 100 to 135.

Correspondingly the price of rice has risen from 12.54 *yen* per *koku* in 1909 to 57 *yen* in 1919, and in consequence the Government since 1920 has made proposals for meeting the future deficit, by crop improvement, by increasing the importation from Corea and Formosa, by giving up to rice cultivation waste lands which are wet or irrigable, or by encouraging the adoption of some food substitute.

The Japanese Government, in order to control the price, exempts the rice import from payment of duties

when the national crop is below a certain level and encourages importation, itself leading the way, whereas in the event of a good crop the duty is raised and right of private importation restricted, in spite of the protest naturally made by the consumers.

It is the opinion of agricultural experts that the best method of bringing waste land under cultivation, provided it is irrigable, is to place it under rice, as no other crop gives from the first year onwards such a yield as rice. Accordingly the experts are asking that special statistical economic world enquiries may be made into the whole subject. They demand also the passing of legislation in favour of this branch of production and trade, and of land reclamation, as well as the adoption of general measures for adjusting the equilibrium of world food production. A programme relating to the collection and elaboration of the Far East data is also confidently looked for, as facilitating systematic and sustained enquiry into distribution of rice crops, cultivation costs, return from capital and course of prices. In this way the bodies directing the agricultural policy of the different States will be in a position to follow the world economy of the production of this most widely diffused of the cereals.

Such a development of international research and enquiries on rice is a subject of special interest at the present time, since the European rice-growing countries are undergoing a crisis of prices in this branch of their national production.

The crisis depends on the fact that the production cost increases and that the home consumption in these countries is less than the production: accordingly the home price is closely connected with that of the world market, and in regard to this product the effect of the protective duty is small. The consequence is that some of these European countries, as for example Italy which leads in Europe with a production of rice of 6,900,000 quintals, Spain with a production of 3,200,000 quintals, Bulgaria with 170,000 quintals, Portugal with 175,000 quintals, and other European countries with a lower production, are obliged to make

immense competitive efforts among themselves so as to meet, though not very effectively, the Asiatic, African, and American competition.

The world situation may be regarded as follows :—

Europe produces in the aggregate about 10,500,000 quintals: accordingly this European production, as compared with the world production, does not reach 0.8 per cent. On the other hand, Asia which is the great continent of production yields 95.2 per cent. of the world production. Africa contributes 2.4 per cent., America 1.6 per cent. Europe is thus the continent with the smallest production.

As is shown by graph No. 1 (omitted) the world production from 1909-1913 to 1926 has undergone a certain variation. Up to 1924 it steadily increased from year to year reaching in that year the figure of 856,636,000 quintals, it then fell in 1925 to 853,647,000 quintals in 1926 to 845,587,000 quintals. Asia forms the great centre of production, with more than 95.2 per cent. of the world production and a maximum in 1924 of 805,541,000 quintals.

(1) Taking into account that these figures do not include data for China and for other countries where it is impossible to obtain statistics, it may be estimated that the world production of rice varies round about 1,200 to 1,300 million quintals: a figure nearly equal to that representing the production of wheat.

It is well known that rice is the food basis of the whole Asiatic world. Seven hundred million persons living between Tokio and Colombo, taking Shanghai, Canton, Saigon, Batavia, Bangkok and Calcutta on the way, make their daily meal of rice almost exclusively.

The increase of the production in 1924 may be due to the fact that the year was favourable to rice cultivation in all rice growing countries, to reasons of economic supply policy of the Oriental countries and their inter-Asiatic trade in rice, and to increases in the production of food stuffs.

As shown above the area cultivated in rice in Asia reaches very high figures, in comparison with the other countries as is seen in the graph No. 2 (omitted). The maximum area was reached in 1909-13 when the percentage was 96.4, while in 1925 it was as high as 94.6 on the total.

*Comparison between the World Production of Rice
and the Asiatic Production.*

PRODUCTION OF RICE.					
Years.	General Total. 1000 quintals.	Asiatic production. 1000 quintals.	%	Other countries. 1000 quintals.	%
1909—13	774,543	743,094	95·9	31,440	4·1
1923 ...	798,763	752,078	94·1	46,685	5·9
1924	856,636	805,541	94·4	51,095	5·6
1925	853,641	803,916	94·2	49,731	5·8
1926	845,581	796,150	94·1	49,437	5·9

*Comparison between the total area and the Asiatic Area
under rice cultivation.*

AREA CULTIVATED IN RICE.					
Years.	Total Area. 1000 hect.	Area in Asia 1000 hect.	%	Other Countries 1000 hect.	%
1909-13 (1909-10 1913-14)	48,171	46,445	96·4	1,726	3·6
1923 (1923-24)	52,679	50,174	95·2	2,505	4·8
1924 (1924-25)	54,317	51,401	94·6	2,916	5·4
1925 (1925-26)	55,090	52,164	94·6	2,926	5·4
1926 (1926-27)	54,255	51,194	94·4	3,060	5·6

In 1925 the total area under rice cultivation showed small increases as compared with 1924; but the climatic conditions were not wholly favourable in certain Asiatic producing countries, *e. g.*, India, Indo-China, the Philippines. These slight declines in yield, observed in these countries, have occasioned a reduction in the average yield in the whole of the Asiatic production, in spite of the satisfactory results of the crops of other producing countries.

The following figures show the world trade in rice. While the excess of imports of the other continents amounts in 1909-13 to the figure of 18,563,000 quintals and in 1923

to 12,676,000 in 1924 to 13,797,000 in 1925 to 18,061,000 and in 1926 to 14,085,000 quintals, the excess of exports from Asia amounts in 1909-13 to 20,898,000 quintals, in 1923 to 11,109,000, in 1924 to 13,299,000 in 1925 to 16,814,000 and in 1926 to 14,769,000 quintals.

It must be remembered that China with its enormous production has a closed market: that Japan imports from its own possession Corea over 5,000,000 quintals of rice: that Siam alone exports about 12,000,000, and Indo-China about 10,000,000 quintals, that Madagascar with a production of 10,000,000 quintals exported 417,000 quintals in 1925 and 219,000 in 1926; while on the other hand the Dutch Indies import from 5 to 6 million quintals, although the island of Java has a production of 52,000,000 quintals of rice.

This world situation does not easily admit of modification, simply because the European peoples who are meat and wheat eaters cannot adapt themselves to a combination of rice with their daily food. Consequently although it forms the basic food of more than half the earth's population, rice cannot easily command wider markets. While in Japan the annual consumption per inhabitant is over 150 kilogrammes, and in Siam and the island of Formosa it exceeds 120 kilogrammes, in Italy which leads in this respect among the producing countries of Europe, the consumption does not exceed 7 kilogrammes per inhabitant, as compared with 180 of wheat.

The question of the tastes of the consumers is however balanced by that of prices which also calls for serious consideration.

From 1900 to 1926 the price of cleaned rice in Italy was much higher than that of wheat. The 1900 to 1914 averages exceed those of wheat by 22 per cent. (31.37 liras as compared with 25.75); the war period price averages are 23 per cent. higher than those of wheat (63.70 liras as compared with 51.86); those of the period 1920-25 are 48 per cent. higher (183.21 liras as compared with 123.31). In 1926 the ratio of the higher price fell to 9 per cent.; and in 1927 it fell lower, almost to par; the consequence is that the rice growers are now afraid of the situ-

ation becoming reversed ; a contingency against which they cannot safeguard themselves as it is extremely difficult to ensure an increase in the home consumption of rice and equally difficult to reduce the production costs of rice which are considerably higher than those of wheat.

The problem thus is for the European rice growers to find an export market; rice may become a partial substitute for imported wheat, but it cannot hold its own against the competition of wheat which is a product greatly preferred by the consumer.

The following point is also worth noting. On the London market the price of cleaned rice in 1926 was 9.4 per cent. lower than in 1925 and in 1927 it was 22.7 per cent. lower. On the Italian market it was 20 per cent. lower in 1926 than in 1925, and in 1927 it was 37 per cent. lower. The decline on the European growers' market is thus much more pronounced than that on the British markets which are merely import markets. Hence we are led to the conclusion that extra-European types of rice have undergone less decline in value than has been the case with the European growths.

As regards cost of production the following facts should be noted.

In Italy precise calculations on the unit production costs have been made by two eminent students of the subject, Dr. Salvatore Pugliese and Ing. Andriano Tournon. The result may be stated thus; on a cultivation unit of 230 hectares of rice land the average yield was 57.73 quintals per hectare, the cost of each quintal of the reaped rice was 103.63 liras. And as the best Italian rice sells today at 78 liras per quintal at highest, for the agricultural year 1926-27 the Italian loss varies from 25 to 30 liras the quintal. Special monetary causes may however be responsible.

Spain is suffering from a similar situation ; and in order to protect its rice production it has been arranged to grant a premium of 3 pesetas per quintal to be applied when the price of rice is lower than 48 pesetas per quintal.

Accordingly the European countries not prepared to adopt a system of export premiums must try to increase

consumption by means of special measures, *e. g.*, using rice in bread-making, difficult because consumers object; or must reduce the area under cultivation, equally difficult as causing agricultural unemployment. It is enough to consider, in regard to this second point, the case of Italy where the cost of cultivating meadowland is reckoned at 726 liras per hectare including 316 liras for labour, while the cultivation costs of rice are 3,991 liras of which nearly 1,920 represents labour whereas in the cultivation of wheat the labour is represented by 1,040 liras. The meaning of this is that the cultivation of rice absorbs 93 percent. more labour than that of wheat and nearly 500 per cent. more than meadowland cultivation. In other words: the question because a social question with a view to the prevention of unemployment of a specialised form of labour and resolves itself into a question of food and supply policy.

Further comment is not out of place as regards Italy, since conditions there are typical and may represent in general the European position.

The Italian rice crisis is undoubtedly in connection with the marked and rapid decline in the prices of the chief agricultural products; but the fall in the price of rice which for certain regions of Northern Italy constitute the most important present day agricultural problem, has been enormous: since the price of cleaned rice fell from 213.12 liras the average quotation of the first half of 1926, to 152.85 liras in the first half of 1927 and to 118.49 liras in the third quarter; and rough rice fell correspondingly from 145.04 liras 106.06 liras and to 78.97 liras and finally at the end of 1927 to 70 83 liras per quintal.

In Italy the principal problem is the maintenance of the level reached by Italian production which was 6,800,000 quintals of rough rice in 1926; taking into account the average of cleaned rice calculated at 4,200,000 quintals; of the home consumption calculated at 2,800,000 quintals; and of the remaining 1,400,000 quintals of cleaned rice available for export. Italian rice must maintain on the world markets the competition with the Asiatic kinds, which are of lower intrinsic value but of considerably lower price owing to

low cost of labour or to fortunate climatic conditions; with the Spanish rices, which are of similar quality and are similar in price; with the American rices which cost less than the European, because in both North and South America the price of land is lower, as well as taxes and irrigation costs; and moreover the cultivation costs are lower, in so far as rice cultivation can frequently be carried out by intensive methods making use of the reserves of fertility stored in the soil.

To pass from the European crisis in rice-growing to the consideration of the world situation, nearly 52,000,000 hectares are under rice and in the agricultural year 1925-26 the production has exceeded 800,000,000 quintals of rough rice. Africa comes next with 1,632,000 hectares under rice cultivation and a production of more than 23,400,000 quintals; then America with about 1,040,000 hectares and production in excess of 16,000,000 quintals. In Europe only 204,000 hectares were under rice in 1927 and the production was about 10,000,000 quintals. Australia comes last, and has recently begun to cultivate about 4000 hectares, with a production of 58,000 quintals. Among the great continents Europe has the smallest figures of area and production, but it stands first in yield per hectare.

The maximum European yield 47·2 quintals per hectare, was reached in 1925-26, while the American rice lands hardly reached 15·7 quintals, the African 15·6 the Asiatic 15 and the Australian 15·5 per hectare.

(Int. Rev. of Agri. Eco. & Socio. Feby. 1929).
