II. Experiment with "Bari" (Alkali) Soil of the Punjab

Next a naturally alkaline soil like the "Bari" soil of the Punjab was similarly tried. This soil is very impervious to water due to the presence of considerable quantities of sodium carbonate and sodium sulphate. Experience showed that care is necessary in packing the "Bari" soil so that breaks in the column do not occur on wetting. This is ensured by loosely packing the soil in the tubes. Tables 3 and 4 give the values for capillary rise in and percolation through the "Bari" soil.

Table 3

Capillary rise in "Bari" soil (in cms.)

Time (Hours)	Water	5% Sodium chloride
1	2·4	8·2
2	3·4	14·0
3	4·0	17·2
4	4·4	21·2
22	10·3	46·7
28	11·2	51·3
48	12·7	61·0

It is clear from Tables 3 and 4 that the movement of a 5 per cent. solution of sodium chloride is much faster than that of water in the "Bari" soil.

Table 4

Percolation in c.cs. through a 10 cm. column of "Bari" soil

Time (Hours)	Water	5% sodium chloride
1	0	0
2	0	1·0
3	0	3·0
21	0	16·5
27	0·5	21·0
48	1·0	48·0
71	2·5	74·5
96	3·0	121·5

The applications of the above findings to the leaching out of the salts from alkali soils are being investigated. Similar experiments with other salts are in progress, and the results will be reported in a later communication.

1. Ramdas, L. A., and Mallik, A. K., *Proc. Ind. Acad. Sci.*, 1942, **16** A, 1. 2. ——, *Ibid.*, 1942, **16**, 16. 3. —— and Pandit, U. P., *Curr. Sci.*, 1942, **11**, 288. 4. Ramdas, L. A., and Mallik, A. K., *Curr. Sci.* 1942, **13**, 42–288.

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THE PROCESSING OF MAIZE TO IMPROVE ITS VALUE AS AN ARTICLE OF HUMAN FOOD

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MAIZE is one of the more important millet crops of India. It is also grown quite extensively in other parts of the world and very large quantities have been imported into India in recent years. It is used as an everyday article of diet in certain parts of the country, while, in other parts, its use is rather unfamiliar or unpopular. Persons accustomed to rice, wheat, tapioca and such other food materials do not like maize because of its hard and fibrous coat, the bitter principle usually associated with the skin and the oil present in its germ. The latter also tends to turn rancid on long storage and renders the grain unpleasant as an article of food.

Whole-Maize is not Popular Over a Large Part of the Country

During recent years, several attempts have been made by the Central and Provincial Governments and also by the States to popularise the use of maize as an article of food. These efforts have met with only moderate success because the average consumer, say, of rice, prefers to go on a reduced ration of his favourite cereal, rather than have extra food in the form of maize which he does not like and which he finds to be coarse and difficult to digest. This is chiefly due to the fact that the maize is supplied to him either as a whole-grain or as whole-flour (coarsely ground), neither of which he is able to utilise satisfactorily. The position will be very different if the grain can be processed to remove the undesirable constituents and then supplied to the public as an article of food.

The 'American Flour'

A few decades ago, processed maize flour was introduced into India, the supplies coming chiefly from America. The product soon became very popular so much so that it found application in a variety of food preparations. In South India, it became very popular as 'American flour' and there was a very great demand for it, though only a few people knew what it was made of.

Processed Maize Products and Their Uses

In Europe and America, processed maize flour is finding extensive application. It is the basis for the usual thickeners of soups, breakfast cereals, various types of sweets as well as meat puddings, ice-cream and so forth. Other preparations like spaghetti and macaroni which are also familiar to the Indian consumers are prepared out of maize flour.

Considering all available evidence, it would appear to be extremely important that maize should be first processed and preferably converted into a clean, attractive flour before it could find general, popular favour in India. The husk and the germ can be separated, the former being used as an animal feed, while the latter can be crushed and used for preparing

maize oil which can be used for soap-making and other purposes.

The existing Starch Factories can be used for the Production of Processed Maize Food

Some years ago, a number of starch factories were started in different parts of the country to meet the increasing demand for starch from textile and other industries. There are now about twenty fair-sized factories in India with a capacity for handling hundreds of tons of maize per day. These factories were working very actively during the war, but, recently they have been thrown mostly out of commission because of the necessity for distribution all available maize as an article of human food. As already mentioned, the results of this change have not been as happy as was originally expected. While the starch factories have been mostly idle, maize is not finding much favour as human food and quite large quantities are perishing in different parts of the country.

A modern starch factory has the necessary equipment for the steeping, efficient removal of the skin, separation of the germ and other processing of maize. These operations form a part of the process connected with starch manufacture. It appears very desirable, therefore, that instead of keeping the starch factories idle, their equipment could be utilised for processing the maize in such a way that they will turn out acceptable articles of human food. It should be possible for an average starch factory to turn out a flour that would exclude the skin and the germ, but include the rest of the grain as a fine flour. This flour would be attractive and can be used for a variety of purposes. There is strong justification for preparing bulk specimens of the finished products and conducting consumer tests with them over different parts of the country.

The Maize Grit

The above would be a wet method of processing the grain. That would necessitate the drying of the final product. There is also some risk of a part of the maize oil being carried along with the maize gluten which would form a part of the flour. There are also dry methods which could be used for the removal of the skin and the germ. The remaining part of the grain could be converted into a form which is commercially known as maize grit and which can be used for a variety of purposes. The equipment for the manufacture of maize grit is available and can be easily obtained from abroad. If some maize grit could be prepared in India or imported from America, some consumer-trials could be carried out with it and the public given the benefit of demonstrations in regard to its varied uses. Arrangements could then be made for the importation of the necessary machinery.

The Industry can be Easily Started and Extended

Some of the manufacturing firms in the country are already familiar with the methods of producing processed maize flour and also maize grit. They could obtain the required equipment and set them up if the necessary assistance is given. Once maize products could be made popular to the average rice and wheat-eating sections of the population, its future would be quite assured, and there will be enormous demand for maize products all over the country. The various factories in the country will have also have plenty of work to do; in fact many more new factories will be needed. The Government can investigate the matter through its Food Technical Panel and plan the organisation through its appropriate Food Industrial Panel.

Any important process successfully applied in the case of maize would also be generally applicable in the case of jowar and other coarse cereals. By suitable processing both human food in popular forms and also concentrated animal food out of the coarser fractions can be obtained. In this manner a balanced system of food production can be evolved with increasing benefit both to man and to

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AIR MASS INTERPRETATION OF SEN'S VORTEX METHOD OF WEATHER FORECASTING

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IN his review of Indian Weather in Köppen Band, Normand[1] pointed out that the concept of different air masses is old and implicit in the terms usually employed by the weather forecasters in India, but lacked the pictorial appeal of the theories which had then recently become common in the extra-tropical latitudes. A deep coist of monsoon current and a dry current were the main distinctions employed. Simpson and earlier workers[2] considered the monsoon stream as the continuation of the S.E. Trades of the southern hemisphere. Many workers tried to find out the different sectors and air masses that were required in the period of S.W. monsoon and for the cyclonic storms at other periods.[3] Roy and Roy[4] found that the monsoon depressions could be considered as consisting of three sectors with the following air masses; (*a*) fresh monsoon air, (*b*) monsoon air deflected by the hills in N.E. India and (c) the dry continental air. The very nomenclature restricted the scope of enquiry into the ultimate origin and properties of the air masses. Due to various reasons the origin of the air masses was left vague by other workers also. The position could not be described as satisfactory. Many forecasters including the author were content to find facts which could be used as simple criteria and sometimes use the concept of air mass when the signs for the latter were definite. The analysis of extensive weather charts and a technique of uniquely drawing isobars,[5] even when pressure gradients were weak and the number of ob-