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Circular No. 54A.
26—7

FROM

C. S. BAYLEY, Esq., c.s.

Offg. Under Secretary to the Government of India,

TO

The Secretary to the Government of Madras.

Rev. & Agri. Dept.
Agriculture.

Simla, the 8th May 1885.

SIR,

WITH reference to Mr. Holderness' circular No. 65, dated the 5th June 1884, on the subject of the Barilla Industry in India, I am directed to enclose for information a copy of an article on Barilla, prepared, from the reports received from Provincial Governments, by Mr. G. Watt, who is now employed on special duty with the Government of India.

I have the honour to be,

SIR,

Your most obedient Servant,

Chas. S. Bayley

Offg. Under Secretary to the Government of India.

Dictionary of the Economic Products of India.

Reh Efflorescence of Sodium Carbonate.	BARILLA.
[Extract from "Dictionary of the Economic Products of India," presently being published by the Revenue and Agricultural Department, Government of India.]	
BARILLA.	
<p>Barilla (a crude carbonate of soda) is in India obtained from two sources: (a) as an efflorescence on the soil, and (b) from the ashes of certain salt-worts or plants containing sodium.</p> <p>The former is scarcely known in Europe and should receive the name <i>sajji-mati</i>, while the carbonate of soda obtained from plants is, strictly speaking, the barilla of commerce or the <i>khār-sajji</i> of Indian bazars.</p> <p>CARBONATE OF SODA OBTAINED AS AN EFFLORESCENCE.</p> <p>(a) <i>Sajji</i> and <i>Sajji-mati</i>.—The efflorescence known as <i>reh</i> is exceedingly abundant in India, occurring over many large tracts of country, often rendering the soil quite sterile. This has within recent years received the most careful attention both of the Agricultural Departments and of the Geological Survey. Under "<i>Reh</i>" this subject will be dealt with at greater detail, and it is necessary here to refer to it only in so far as it is connected with the subject of <i>sajji</i> or barilla. The decomposition of rocks through the action of the atmospheric oxygen and carbonic acid gives origin ultimately to soluble sulphates, carbonates, and chlorides. These are carried away by the rivers. In the fresh-water alluvial plains of India such salts have accumulated during the lapse of centuries, to an extent sufficient to give origin, by chemical changes in the soil, to the so-called <i>reh</i> efflorescence, the heat of the sun drawing the ultimate salts to the surface. In an interesting report on this subject, published by Dr. W. C. C. Panjāb Chemical Examiner, the process of capillary attraction, or the drawing of the salts to the surface in the form of an efflorescence, is carefully gone into. "These salts, however, are not deposited, as they exist in solution, as new laws come into play. The chief of these is that during evaporation the least soluble salt that can be formed is first deposited; but this is modified by two other laws,—the tendency of certain compounds to form double salts, and the tendency of substances with the same crystalline form to crystallize out together. The efflorescences thus produced consist of three groups: 1st, the neutral, which contain no carbonate of soda (these consist chiefly of sodium chloride and sulphate, and frequently magnesium sulphate); 2nd, the alkaline, which contain carbonate of soda, and alkaline chlorides and sulphates, but no lime or magnesian salts; 3rd, the nitrous efflorescences. These generally contain no alkaline carbonate, but consist chiefly of nitrate of lime and alkaline chlorides. Others contain alkaline nitrate, chloride and sulphate. They are developed where the soil has become loaded with organic nitrogenous matter."</p> <p>"<i>Reh</i> is thus not a special salt or mixture of salts, but a very variable compound. It is really the most easily soluble salt in the earth-water, remaining in solution after the deposition of carbonate of lime, &c., on evaporation. The ingredients and their relative proportions are found to vary in different places, exactly as the well-waters at different spots differ in saline contents, and in the same area there is a close relation between the two."</p> <p>Mr. Medlicott, Superintendent of the Geological Survey (<i>Records of the Survey, Vol. XIII., 273</i>), has also contributed greatly to our knowledge of <i>usar</i> (sterile) and <i>kalar</i> (saline) lands, and has thrown much light on the explanation of <i>reh</i> efflorescences. He has shown that the relative proportion of common salt to sodium sulphate varies from 4 to</p>	
	SAJJI-MATI. 110

BARILLA.	Reh Efflorescence of Sodium Carbonate.
SAJJI-MATI.	24 per cent. In one district one salt predominates, in another a second is more abundant. Common soda (carbonate of soda— <i>sajji</i>) is sometimes present, and such earths are locally used by the washermen in place of soap. This is, however, a much less frequent <i>reh</i> efflorescence than sodium sulphate; but it seems likely that the so-called <i>sajji-mati</i> of our Indian bazars is a specially selected <i>reh</i> , containing as its principal ingredient carbonate of soda. <i>Sajji</i> , strictly speaking, means pure carbonate of soda.
BERN. II11AL.	Occurrence of Sajji-mati.—In Bengal <i>sajji-mati</i> is said to be found in Behar north of the Ganges at Patna. O'Shaughnessy mentions that it exists in great abundance in the neighbourhood of Monghyr. In a recent correspondence conducted by the Government of India, Revenue and Agricultural Department, and at the instance of Sir J. D. Hooker, the Commissioner of Salt Revenue, Madras, reports: "As soils containing a large percentage (from 30 to 50 per cent.) of carbonate of soda, abound <i>dhobiyer</i> the country and are habitually collected by the people for use as glass by earth, and in dyeing, and for the manufacture of soap and of barrilla tangles, I see no advantage in undertaking the manufacture of <i>sajji-mati</i> in Mysore and Travancore, and a small internal trade exists in conveying it to the town of Madras. It is purified by a simple process of lixiviation: This same practice prevails in some parts of the North-West Provinces where <i>sajji-mati</i> occurs; it is said to be prepared at Ghazipur. In the correspondence referred to it is stated that the Lucknow Paper-mills have, at the suggestion of the Agricultural Department, commenced to manufacture their own caustic soda from the <i>reh</i> earth. By this improvement they have effected an annual saving of Rs. 11,000; they have at the same time abandoned the importation of European caustic soda. In the Panjab <i>sajji-mati</i> is said to be prepared at Multan, carbonate of soda, and Shahpur (<i>sajji-khar</i>). In Bombay <i>sajji-mati</i> or reports that soda efflorescences is met with. The Collector of Ahmedabad the efflorescence is not manufactured from plants in his district, but that in the manufacture known as <i>oos</i> or <i>khār</i> is used in washing clothes and also in the North-West Division of Bombay this <i>oos</i> efflorescence is said to cover a large area. In the Panjab this <i>oos</i> efflorescence is said to cover both the Panjab land; it is used extensively for soap and glass making, import, however, mills and the Soap-manufacturing Company of Bombay prepared artiver, their caustic soda from England, having found the locally manufactured more expensive.
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PANJAB. 114	
BOMBAY. 115	
	Medicott (C. of Sajji-mati).—Speaking of sodium efflorescences, Mr. from the (Official Correspondence) says: "The direct derivation of soda manufacture salts would no doubt be an easy process (for a chemical and it is then; sometimes soda forms a principal constituent of the <i>reh</i> , of the <i>reh</i> is freely utilised by the <i>dhobies</i> ; but the commonest constituent 'soda' man is sodic sulphate, which is the first result in the process of acid. Thus, therefore, by the treatment of common salt with sulphuric acid and the furt the most expensive part of the process would be saved, by the activer conversion of sodic sulphate into sodic carbonate ('soda'). Chemistry, on of lime and fuel is simple." Mr. Pedler, Professor of examined in Calcutta, says that the samples of <i>sajji-mati</i> which he has a commercial consisted mainly of carbonate of soda. He adds: "As barrilla obtain article, I believe <i>sajji-mati</i> is usually more valuable than the 25 or 30 per cent from Spain, for while barrilla rarely contains more than contain as much as 50 per cent. of that substance." (Official Correspondence, 15th, 1884, No. 7816.

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Barilla or Sajji-khar.	BARILLA.
CARBONATE OF SODA OBTAINED FROM THE ASH OF CERTAIN PLANTS—BARILLA.	BARILLA.
(b) <i>Khār-sajji</i> , or <i>Sajji-khar</i> , or <i>Barilla</i> .—This is carbonate of soda obtained from the ashes (<i>khār</i>) of certain salt-worts. This must not be confused with pearl-ash or the form of potassium carbonate obtained from most other plants. In the correspondence to which reference has already been made this mistake occurs, lists of pearl-ash plants having been enumerated as those from which barilla is obtained. The manufacture of barilla first assumed commercial importance in Spain, and was an article of considerable value until Le Blanc discovered his method of preparing soda from common sea-salt. Since then it has considerably declined. Before this important discovery the demand for barilla caused attention to be directed to India as a country to which the trade might possibly be extended. Roxburgh at the beginning of the century recommended the cultivation of one or two plants on the coast of Madras, but there is no evidence of this having been acted upon.	SAJJI-KHAR.
Mr. Baden Powell (in his <i>Panjab Products</i> , Vol. I, 86) has given a most instructive account of barilla manufacture as practised in the Panjab. The process by which this substance is prepared is carried on during the month of October and the three following months. The plant after being cut down is allowed to dry. The next step is to dig a pit of a hemispherical shape, about 6 feet in circumference and 3 feet deep. One or more vessels with holes perforated are inverted and placed in the bottom of the pit, the holes being kept closed when the operation begins. The dry plants are gradually burned, and during the process a liquid substance is found to run down into the inverted vessels. After this has taken place, the residue is stirred up by means of a flat piece of wood and kept covered over for three or four days till it cools. Care must be taken not to allow water to get to the molten liquid, otherwise the whole mass would blow up. In the inverted vessels will be found a pure form of <i>khār-sajji</i> , and in the bottom of the pit an impure form containing a mixture of ashes. This process differs only very slightly from that followed in Spain. In the latter country the plants are burned on iron bars placed across the mouth of the pit, and vessels to separate the substance into pure and impure barilla are not placed in the bottom.	MADRAS. 116
In the correspondence to which repeated reference has already been made, the Panjab Government has supplied some interesting information regarding the present condition of the manufacture of barilla. The industry exists only to a limited extent in Montgomery and Jhang, and not at all in Jhelum, Rawal Pindi, Gujarat, and Mozafargah. "In Shahpur and Multan, however, the manufacture of <i>sajji</i> is considerable. The Deputy Commissioner of Shahpur reports that the output is from eight to ten thousand maunds a year, and the revenue derived by Government by the lease of <i>sajji</i> -producing lands amounts at present to over Rs. 500 per annum. The price, too, from various causes has risen from Rs. 2 to about Rs. 10 per maund since 1865.	PANJAB. 117
"The income derived in the Multan district is also increasing, and though not so high as it was ten years ago, is higher this year than in any year since 1880." The Deputy Commissioner of Multan says that in his district the plants are cut in the months of January and February, and not in October and November as stated in Baden Powell's <i>Panjab Products</i> . He adds: "I can find no evidence that the introduction of soda salts manufactured by purely chemical processes has injuriously affected the trade in barilla." He adds that the land on which barilla-yielding plants grow was leased for 1883-84, and realised Rs. 7,007, which is higher	

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No. 3845

1885.

GOVERNMENT OF INDIA.

REVENUE AND AGRICULTURAL DEPARTMENT.

AGRICULTURE.

To

Circular No. 54A.
26-7

Dated Simla, the 8th May 1885.

So. No. 2767
Circular through the
S^d of Revenue to
the District R. S. O.
The note up to what
has been done in refer-
ence to So. No. 1021
of 10 Sept. 1884.
H. W.
14-5-85

SUBJECT

Forwards Dr. Watt's article on the Barilla Industry in India.

1-6-85

1/6 The Board of Revenue
with the Secy to Govt.

Recd 3845