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THE SALT-BEARING SANDSTONES OF TASMANIA

Introduction

It is a conspicuous fact that salt lakes are found in arid or semi-arid regions, and of course do not possess a permanent outlet. In short, salt lakes are formed in districts of inward drainage where evaporation is greater than or equal to the rainfall. Since exact equilibrium is of rare occurrence it follows that such lakes are usually drying up. Although, most salt beds have been formed by the dessication of island lakes, in some cases the enormous thickness of such deposits can be explained only by the evaporation under special conditions of vast volumes of sea-water in a nearly enclosed marine basin. Such probably was the mode of formation of the Stassfurt deposits. In some instances underground movement of such salts after original deposition has led to the formation of salt domes as cores of anticlines and as domes at the crossing of two folds.

Rock-saltsbeds are common - not so beds containing salts of potassium and magnesium. Owing to the high solubility of these latter salts they are not deposited unless dessication is complete, or nearly so, and this seems rarely to have happened. In consequence, large deposits of potassium salts are few and the commercially important ones can be counted on the fingers.

The Nature and Composition of the Salt Beds

In the Ross sandstone member of the Trias-Jura formation near Buckland are beds containing extraordinary proportions of common salt and epsomite. The Stratum comparatively rich in common salt is about 15 feet thick, and consists of white, slightly felspathic, siliceous sandstone. Twenty feet below that is the epsomite stratum, 5 feet thick, consisting of similar fine-grained sandstone of a yellow to light pink colour flecked with brown. In this rock the epsomite is evenly distributed, and, immersed in water the sandstone, following the dissolution of the salt, readily disintegrates into its component particles. The rapid disintegration of these strata on the weather side is well illustrated by numerous extensive caves formed along the cliff-faces overlooking Bluff River. In these caves the salts have been redeposited on the floors from percolating solutions.

These strata can be traced without interruption many miles but the salts contents vary appreciatively from point to point. The following are the results of analyses of the epsomite sandstone and salt sandstone respectively:

No. 500 hydrous magnesium sulphate 4.64 per cent

No. 501A sodium chloride 1.46

These common salt and epsomite beds have been observed by A. Montgomery in the valley of Kangaroo River, and by W.H. Twelvetrees and the writer in the neighbourhood of Ross and other parts of the Midlands. The removal of these salts from the sandstones by solution in water has

resulted in the formation of the salt-pans or sinks so commonly found near Ross and Tunbridge.

The Value of the Deposits

These beds of rock salt, epsomite, and gypsum are found at a particular horizon in the sedimentary series of the Midland formation. In no place, however, except in the "pans" and in caves cut into these salt bearing sandstone beds are deposits of concentrated salt known or likely to be found. The reason given is based on the fact that folding of the containing strata to allow of concentration of particular points by the agency of percolating underground water, is not in evidence. On the contrary, these strata have been disrupted in an extraordinary manner by intrusive diabase, and many ways of escape have thus been provided for the solutions. This is exemplified by the salinity of the waters from the numerous springs in the sandstone member of the formation.

Summary

The salt beds are of local value only.

Details of analysis of the sandstones near Buckland are given in the sub-joined tables:-

Epsomite Sandstone Bed.

Silica	82.72	per	cent
Ferric oxide	1.96	"	"
Alumina	6.58	"	"
Lime	1.82	"	"
Magnesium sulphate (epsom salt)	4.64	"	"
Sodium Chloride (common salt)	1.70	"	"

Common Salt Sandstone Bed

Silica	88.82	per	cent
Ferric oxide	2.54	"	"
Alumina	5.04	"	"
Lime	0.34	"	"
Magnesium sulphate	1.73	"	"
Sodium Chloride	1.46	"	"
Sodium sulphate	0.06	"	"

Analysis of Common Salt from floor of Cave.

Silica	10.40	per	cent
Ferric oxide	1.11	"	"
Alumina	1.47	"	"
Lime	1.18	"	"
Magnesium sulphate	0.75	"	"
Sodium chloride	85.16	"	"
Sodium sulphate	0.53	"	"

From the analyses it will be noted that the salts are composed almost wholly of sodium chloride and magnesium sulphate, the salts of potassium being in very

small proportion - so small as not to be worthy of inclusion in the certificates of analysis. The magnesium sulphate in sandstone at the place sampled, if truly representative of the bed as a whole, is in high proportion and may prove of commercial importance. Further investigation is desirable to determine the average value and extent of the deposit.

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