

Dr. Gale, yet a variation not at all too great to be fully explained by the increased volume of the lake, and the consequent decrease in concentration. An investigation of the water by Allen in 1869 (see King's report) showed the total solid matter to be 14.9934 per cent. The present writer made an analysis on water taken from the lake in December, 1885, with the following results:—

	Grams per Litre.	Per Cent. by Weight
Sodium chloride (NaCl)....	152.4986	15.5556
Sodium sulphate (Na_2SO_4)..	15.9540	1.4213
Magnesium Chloride (MgCl_2)..	12.6776	1.1296
Calcium sulphate (CaSO_4)..	1.6979	0.1477
Potassium sulphate (K_2SO_4)..	4.8503	0.4321
Total solid matter.....	187.6181	16.7182

This water had a specific gravity of 1.1225. Another sample of lake-water taken in February, 1888, showed a density of 1.1261. A further test was made in June, 1889, the water being 1.148 in density; and in August, 1889, the water was 1.1560. The figures resulting from the latest determinations show a considerable increase in the proportion of solids; and this is fully explained by the succession of excessively dry seasons to which the Great Basin has been subjected since 1882, causing a remarkable shrinking of the lake volume. In August, 1889, the lake was lower than at any times since the inauguration of Gilbert's "new regime." A sample of water was taken from the lake during that month, and analyzed, with these results. The water possessed a specific gravity of 1.1569, and contained,—

	Grams per Litre.	Per Cent. by Weight
Sodium chloride (NaCl).....	182.131	15.7430
Sodium sulphate (Na_2SO_4)..	12.150	1.0502
Magnesium chloride (MgCl_2)..	23.270	2.0114
Calcium sulphate (CaSO_4)..	3.225	.2788
Potassium sulphate (K_2SO_4)..	5.497	.4742
Total solids.....	226.253	19.5576

It would be a difficult task indeed to determine the mean composition of the lake. Its waters rise and fall, and become more concentrated or dilute, according to the conditions controlling the rates of supply and evaporation. The latest analysis reported above, indicating 19.5576 per cent solid matter, though it is a closer approach than usual to the earliest figures, and the ones most widely published, is hardly to be considered typical, since the season of 1889 was one of unusual drought. Two or three consecutive winters with heavy snows would dilute the water to its condition of a few years ago. In the opinion of the writer, it would be more correct to quote

the average contents of the Salt Lake water at sixteen per cent solid matters than at twenty-two per cent, as is most frequently done.

Our subject presents an economical aspect which is well worthy of attentive consideration. The composition of the water is such as to suggest the easy manufacture of a number of chemical substances therefrom. Branches of such an enterprise have already been instituted, and the results achieved have kindled the brightest hopes of increasing success.

The preparation of common salt from the water would be naturally the first undertaking of the kind to suggest itself, and this process has been in successful operation on an industrial scale for a number of years. There are now half a dozen establishments for salt manufacture on the lake shore. At several of these places, however, the preparations for salt-making consist simply in constructing a number of evaporating ponds below the level of the lake, and separated from the latter by dykes of such a height that during periods of rough water the waves beat over the embankments, and fill the ponds with brine. The evaporation of the water thus enclosed goes on without any artificial aid, and a bountiful supply of salt in the season thereof is the result. In such cases the evaporation is carried to completion. All the solid constituents of the brine remain in the salt, there being no attempt made to get rid of the mother-liquors after the deposit of crystals.

At other of the works, however, notably at the Inland Salt Company's Gardens, a different plan is pursued. This establishment is the largest salt-works in the West, and is situated near Garfield Beach, the most popular pleasure-resort on the lake. The method employed by this company differs from those already described in that the water is pumped from the lake into ponds prepared for its reception, and situated above the level of the lake surface. The mother liquors flow off—are returned to the lake, in fact—when the evaporation has reached the proper stage. From the establishment of the works until 1883 the lake was close to the ponds; but, owing to the unusually high rate of evaporation attending the dry seasons of the immediate past, the water has receded, so that at present it has to be conveyed over 2,500 feet to the evaporating receptacles. This is effected by the aid of two centrifugal pumps, raising

together 14,000 gallons of water per minute. The pumps throw the water to a height of fourteen feet, into a flume, through which it flows to the ponds. These are nine in number, and are arranged in series. In the first pond the mechanically suspended matters are left as sediment or scum, and the water passes into the second in a clear condition. The ponds cover upwards of a thousand acres, and the drain channels leading from them aggregate nine miles in length. The pumping continues through May, June and July. A fair idea of the rate of evaporation in the thirsty atmosphere of the Great Basin may be gained by contemplating the fact that to supply the volume of water disappearing from the ponds by evaporation requires the action of the pumps ten hours daily in June and July. This is equal to the carrying away of 8,400,000 gallons per day from the surface of the ponds.

The "salt harvest" begins in August, soon after the cessation of pumping, and continues till all is gathered, frequently extending into the spring months of the succeeding year. An average season yields a layer of salt seven inches deep, which amount would be deposited from forty-nine inches of lake water. The density at which salt begins to deposit, as observed at the ponds, and confirmed by laboratory experiments, is 1.2121, and that of the escaping mother-liquors is 1.2345. The yield of salt is at the rate of 150 tons per inch depth per acre. The crop is gathered on horse cars which run on movable tracks into the ponds. At the works the operations are simple and effective. A link-belt conveyor carries the coarse salt to the crusher, thence to the dryer, after which a sifting process is employed by which the salt is separated into table salt and dairy salt.

It will be seen from the foregoing that the preparation of salt from the lake water consists of little more than evaporation and crushing, and the former part of the operation is effected wholly through natural agencies. The simplicity of the process, and the lavish yield, enable the manufacturers to put their commodity on the market at an incredibly low price. The Inland Salt Company sells dry, coarse salt for the eastern trade, packed on cars at the works, at one dollar per ton.

The quality of the lake-salt is of the highest grade. Several specimens of the commercial article, as manufactured and sold by