



The Age of the Dead Sea

There is a way of calculating the age of the Dead Sea. This interior lake contains concentrated solutions of salts. These salts flow into the sea with the waters of its tributaries. Thermal springs bring salt to the Sea of Galilee, and the Jordan carries them to the Dead Sea, which has no outlet. From the surface of the Dead Sea, in the deep hot rift, the water evaporates, leaving the salts behind. By calculating the amount of salts in the sea and the amount that reaches it annually by way of the Jordan and other streams, as well as from thermal springs on its shores, the approximate age of the Dead Sea can be determined. Such an attempt was partially made. The magnesium salts in the Jordan served as a basis for the calculation. It was reckoned that the present annual rate of influx of magnesium in the water of the Jordan alone, when related to the concentration of magnesium in the Dead Sea, should give a figure of approximately 50,000 years as the age of the sea.⁽¹⁾ The author of this estimate admitted that even this figure is probably too high; the salinity of the Jordan must have decreased with time, for the thermal sources carry more salt when they are young and their temperature is high.

In the above calculation, it was estimated that the Jordan carries six million tons of water daily to the Dead Sea and that it deposits 181 million tons of magnesium annually. However, on an average day more than double that amount evaporates from the Dead Sea,⁽²⁾ and its surface does not fall, other sources must be making up the difference.

The rivers Zerka (Callirhoe) and Arnon, which flow into the sea from the east, carry salt solutions from many springs. The shores of the Dead Sea abound in highly concentrated thermal springs which contain rich amounts of magnesium. These sources flow directly into the sea, bringing a richer influx of magnesium than the Jordan.⁽³⁾ In addition there are, on the shores of the Dead Sea, abundant vestiges of thermal springs with rich sediments of salts that are inactive at present.⁽⁴⁾ It is highly probable, too, that there are submarine sources in the Dead Sea which may provide magnesium, but they are indeterminable.⁽⁵⁾

When these factors are taken into consideration the age of the Dead Sea, computed on the basis of its magnesium content, must be drastically reduced.

A computation that takes, as its basis, the amount of sodium in the Jordan points to a recent date for the origin of the Dead Sea. The proportion of sodium to magnesium in the water of the Jordan is about 4:1; in the Dead Sea it is 1:2.⁽⁶⁾ If the Jordan were the only source of the sodium for the Dead Sea the age of the Dead Sea would be only about 6,000 years. But the thermal sources on the western, eastern, and southern shores contain sodium too; so may the submarine sources, which cannot be evaluated. It is likely, therefore, that the sea has existed for only about four thousand years. When again the fact is taken into account that the thermal sources are usually more concentrated when they first break out and when they are at a higher temperature, it may well be asked why the age of this sea should not be reduced still more. It is probable that deeper levels of water have a greater salt concentration.⁽⁷⁾

Fifty thousand years as the age of the Dead Sea was an unexpectedly low estimate: the rift in which the Dead Sea is situated is considered to be the result of a catastrophe at the beginning of the first glacial period.⁽⁸⁾ Now a simple reckoning shows that the saline sea with the Jordan has not existed longer than five thousand years.

References

1. W. Irwin, "The Salts of the Dead Sea and River Jordan," *Geographical Journal* 61 (London, 1923), p. 434. [Yaacov K. Benter's 1961 publication arrived at a figure close to 12,000 years. See *Scientific American* Oct. 1983, p. 103.]
2. *Ibid.*, pp. 435-436; [cf. J. Neumann, "Tentative Energy and Water Balances for the Dead Sea," *Bulletin of the Research Council of Israel*, G, Vol. VII, nos 2-3 (1958); cf. also H. Haude, "Ueber Klimatische und menschliche Einwirkungen auf den Wasseraushalt des Toten Meeres in seiner Vergangenheit," *Zeitschrift des Deutschen Palaestina-Vereins*, 88 (1972), pp. 105-139.]
3. Blanckenhorn, "Entstehung und Geschichte des Todten Meeres," p. 29; cf. L. Lartet, *L'exploration geologique de la Mer Morte* (1874), p. 297.
4. R. Sachsse, "Beitraege zur chemischen Kenntniss der Mineralien, Gesteine und Gewaesser Palaestinas," *Zeitschrift des Deutschen Palaestina-Vereins*, 20 (1897), pp. 25ff., esp. p. 33; cf. H. St. J. Philby, "The Dead Sea to 'Aqaba," *The Geographical Journal*, LXVI (1925).
5. Irwin, "The Salts of the Dead Sea," *op. cit.*, p. 438.
6. *Ibid.*, p. 434. Cf. H. Boyko, *Salinity and Aridity* (The Hague, 1966), p. 15.
7. The figures for magnesium according to Terreil, quoted by Irwin (p. 431), are: At the surface of the sea, at the north shore, magnesium constitutes 13.20 percent of solid salt; 120 meters below the surface, five miles east of Kasel Fesaka, magnesium amounts to 16.80 percent of the solid residue; and 300 meters deep at the same point, 15.99 percent. From the account of Tacitus (*Histories* V. 6) it would appear that the Dead Sea was already saturated with salts nineteen centuries ago.
8. Blanckenhorn, *Naturwissenschaftliche Studien am Todten Meer*, p. 115.

