



The Origin of Nitrate Deposits

The Dead Sea, for many centuries proclaimed to be dead and capable of yielding nothing, is today one of the greatest reservoirs of natural nitrate under exploitation in the world, competing with the deposits of Chile.

The deposits of nitrate in Chile are found in a narrow strip over 1400 miles in length, in the great desert in the northern part of the country. The origin of the nitrates is a problem that has not been solved.

This is a moot question on which no two geologists agree . . . One [theory] is that in prehistoric times the entire nitrate zone was a part of the Pacific Ocean, and that through volcanic disturbances that portion of the sea was cut off and the water evaporated by a very slow process. Fish skeletons found in the caliche furnish good proof of this assertion, as does the fact that the Pacific coast is rising gradually. This theory is, however, contradicted by the fact that no bromine exists there—a substance naturally looked for in deposits thus formed.”

Another theory attributes the origin of the *caliche* to an electrical process. A passage of an electric spark through the moist air produces a combination of nitrogen and oxygen resulting in nitric acid. Electrical storms—a frequent occurrence in the Andes—may have acted in this way and formed great quantities of nitric acid. . . .⁽¹⁾

But thunderstorms occur in many other places all over the world, near and far from the sea, and yet there are no deposits of nitrates in these places.

“A later theory maintains that the deposits are an accumulation of land drainage brought down through ages from the highlands along the coast.” But how was it formed in the highlands of Chile? “Others explain the formation as the work of microbes, or as the result of the action of volcanoes discharging through their craters ammonia-charged steam there condensed.” But deposits of nitrates are not formed in other volcanic regions.

No explanation satisfied the chemists and geologists, and therefore new ideas were constantly launched. In the laboratory a very efficient method of building oxides of nitrates is applied: “passing air through a powerful electric arc, in which the nitrogen and oxygen of the air combine chemically to form oxides of nitrogen.”⁽²⁾

Nature is a great laboratory too. The Dead Sea region was the scene of an interplanetary electrical discharge when a powerful electrical spark leaped down from above or sprang up from the earth.

A similar event created the Chilean deposits of nitrates, and the recollections of the Incas of Peru preserved the memory of this grandiose discharge. “Fire came down from heaven and destroyed a great part of the people, while those who were taking to flight were turned into stones.”⁽³⁾

References

1. Enrique Cuevas, transl. in P. G. Beery, *Stuff, The Story of Materials in the Service of Man* (1930), p. 41.

2. *Ibid.*, p. 43.
3. Christoval de Molina, *An Account of the Fables and Rites of the Yncas*, transl. and ed. by C. R. Markham (London, 1873). The chronicle is dated 1574. The event it refers to is said to have occurred “in Pucara, which is forty leagues from the city of Cuzco on the Collao road.

