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Acknowledgments

The photographs have been taken from the following books:

Plate 1: Goldscheider, L. 1975. Michelangelo - Paintings - Sculptures - Architecture. Phaidon Press. London

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EGGS OF DIPHYLLOBOTHRIUM PACIFICUM IN PRECOLUMBIAN HUMAN COPROLITES

Adauto Araújo, L. Fernando Ferreira, U.E. Confalonieri and L. Nuñez, Fundação Oswaldo Cruz, Rio de Janeiro

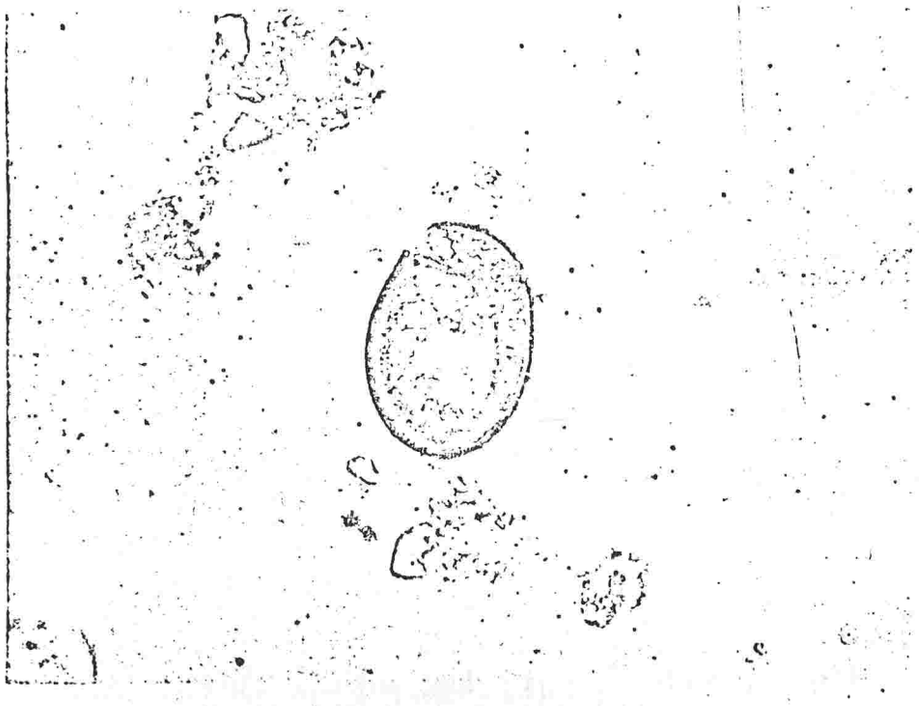
Paleoparasitologists frequently find helminth eggs that are not easy to diagnose. The main reason is that the coprolites are collected in archaeological sites where both animal and human samples can be found together, so that it is sometimes a problem to establish the origin of the coprolite. On the other hand, parasite eggs not commonly found in human feces can also make diagnosis difficult.

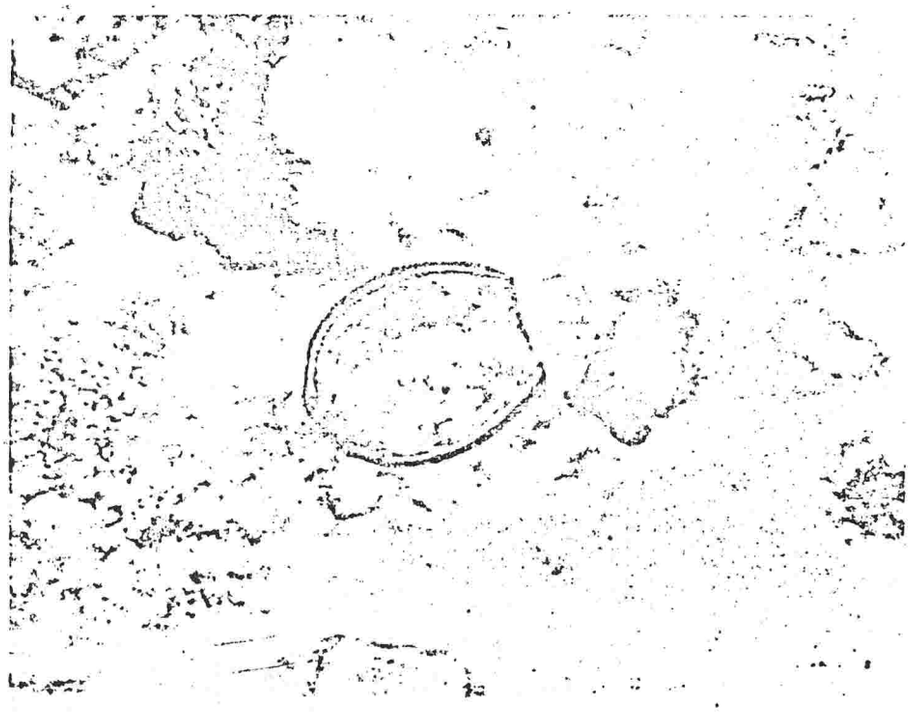
Professor Lautaro Nuñez, from the Universidad del Norte, Chile, recently sent us twenty six coprolites collected from the archaeological site of Tiliviche 1-B, in the arid province of Tarapaca, Northern Chile, 40 km from the coast and at an altitude of 950 m. The site where coprolites with helminth eggs was found was dated from 4,110 B.C. (S.I. - 3 114) to 1,950 B.C. (N - 3773). It is remarkable that such a large number of marine species was consumed by this primitive population, with foliaced and lanceolated stone artifacts, milling implements and typical fishhooks made of snail shells (Nuñez & Moragas 1978).

The coprolites showed clearly the consumption of local cactaceae (Opunti sp) and the presence of particles of coal and quartz, confirming the use of fireplaces and the milling instruments recovered during excavations. Fish remains from the Pacific ocean and local rivers were also found, demonstrating the combined use of both resources.

After rehydration in a trissodion phosphate solution (Callen & Cameron 1960)

Figs. 1 & 2. Eggs of Diphyllobothrium pacificum (× 400)





microscopic analysis was performed. Four of the twenty six coprolites contained operculated eggs (Figs. 1 & 2) measuring 53.63 ± 2.82 u x 39.42 ± 5.64 u (53 eggs measured). The microscopical analysis of the coprolites strongly suggests their human origin, pointing to a diet that includes marine and freshwater fishes, mammals, and plants toasted in fireplaces.

The morphology of operculated eggs points to the genus Diphyllobothrium. Human Diphyllobothrium latum infection in Chile has been described ever since Neghme et al. (1950) reported the first autochtonous case, always related to the ingestion of freshwater fishes in the southern region of the country. There is another species, Diphyllobothrium pacificum, also found in man on the Peruvian coast and in Northern Chile. D. pacificum is a parasite of the South American sea lion (Otaria flavescens), but it can also affect man as a result of his eating marine fish (Baer et al. 1967; Atias e Cattan 1976; Sagna et al 1976).

The differential diagnosis between these two species based on the size of the eggs is stressed by Baer et al (1967), who also, in studying the recent infection by D. pacificum on the coast of Peru, pointed to the possibility of infection among prehistoric populations (Baer 1969).

Based on the morphology and on the measurements of the eggs, we diagnosed them as Diphyllobothrium pacificum, establishing a link between modern populations and the prehistoric one, in both their food resources and in their parasitic infections.

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