MINERALS AND MEDICAL MINERALOGY AND GEOCHEMISTRY

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Since the antiquity, and on an empirical basis, man has accumulated experience on the benefits and risks of minerals (such as, special clay, mud and sand) and other mineral resources (such as, salt, sea water, spring water, underground water, volcanic emissions and dust) on human health. The interaction of the natural environment, particularly when both geologic processes and products are involved deserves more and more interest from scientists, politicians and society. A great number of pharmaceuticals and cosmetics contain minerals *s.l.* (*sensu latu*), that include chemical elements (considered minerals in medical, nutrition and pharmaceutical sciences) and minerals *s.r. (restrictu sensu*), as active principles or excipients. Adopting this concept minerals are in the environment, dispersed and disolved in water (surface and underground), dispersed and disolved in the air, as components of soils and rocks, and as constituents of the human body. They could be the result of either natural processes or of industrial processes. However, in any case, they are in conditions to interact both positively and negatively with the health of human beings, other animals and plants.

The expression Medical Geology, although not so adequate as Medical Mineralogy and Geochemistry, is being used by the scientific community since its proposal in 1996 by the Commission on Geological Sciences for Environmental Planning of the International Union of Geological Sciences (IUGS) and its adoption in 1997. Minerals (like asbestos and crystalline silica) and chemical elements (like some heavy metals and metalloids of natural or anthropogenic origin) could cause hazardous effects, depending very much of the dose intake and exposure time, on human/animal health. However, the indispensability of minerals and chemical elements for good health and wellbeing are undoubtedly reckoned. Both benefits and the risks of minerals and chemical elements on public health should be equally considered.

This presentation discloses examples of the positive effects of a special clay (bentonite) and of a special sand (biogenic carbonate sand) from the island of Porto Santo (Madeira archipelago) which have been traditionally used, almost in the natural state, in topical applications particullarly for the treatment of muscular-skeletal diseases. It is shown that specific properties of minerals, such as crystal size, crystal habit, hardness, specific heat, heat diffusiveness, chemical composition, solubility and dissolution rate are relevant to justify the positive effects of minerals on human health (Gomes and Silva, 2006).

REFERENCES

Gomes, C. S. F. and Silva, J. B. P. (2006). Minerals and Human Health. C. Gomes y J. Silva, eds., 142pp.