

## Mineralogy, environment and health Preface

*Hippocrates, the Greek physician known as the “Father of Medicine”, once noted that “If you want to learn about the health of a population, look at the air they breathe, the water they drink, and the places where they live.” While the overall significance of clean air, land and water on human health is well known as far back as 2500 years (Hippocrates, 460 BC), the relationship between chemical elements and compounds on health could not be established until 4–5 decades ago. It was not until the advent of sophisticated analytical equipment aided by powerful computers that we began to gain a better understanding of how the geochemical environment of a place affects the health and well-being of a population. This recognition in effect laid the foundation of a new specialty that came to be known as “Medical Geology” (Selinus et al., 2005).*

*Medical Geology is an emerging scientific discipline that examines the impacts that geological materials and processes have on human and ecosystem health (Selinus et al., 2005).*

*Thus, Medical Geology:*

- *Identifies and characterizes natural and anthropogenic sources of harmful materials in the environment. In line with Hippocrates, this could translate into the new precept: “Acquire knowledge on Environmental Mineralogy (or Geology)”.*
- *Predicts the movement and alteration of chemical, infectious, and other disease-causing agents over time and space. Hence “Acquire knowledge on chemical flux and speciation (Environmental Physics and Chemistry)”. See Reeder et al. (2006) for a detailed definition of speciation and bioavailability.*
- *Provides an understanding of how people are exposed to harmful materials and describes what can be done to minimize or prevent such exposure. Hence “Determine environmental health impacts (Toxicology and Ecotoxicology)”.*

*At the junction of several disciplinary fields, the “International Symposium on Mineralogy, Environment and Health” was therefore held at the Paris-Est Marne-la-Vallée University, France, on 17–18 September 2009. The symposium provided a forum for discussing recent advances in research and development at the interfaces between environmental mineralogy, toxicology and medical geology.*

*The topical sessions were (1) nanoparticles, environment and health; (2) environmental health: sources of exposure and health effects of trace elements, toxic metal ions, metalloids; (3) mineral dusts and human health; (4) soil–plant transfer; and (5) environmental toxicology.*

*From these topical sessions, four papers related to session 3 (Ibanez et al., Ghorbel et al., Le Bot et al. and Dogan et al.) and two related to session 2 (Rubinos et al., Sivry et al.) have been chosen. These papers aim to understand, respectively, how the geological characteristics of mineral dusts (and the source materials from which the dusts are derived) may influence their roles in human health, and under which conditions by-products of metallurgic activity sequestered in riverine sediments may or may not be released into our environment.*

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### References

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- Selinus, O., Alloway, B., Centeno, J.A., Finkelman, R.B., Fuge, R., Lindh, U., Smedley, P., eds. (2005): *Essentials of Medical Geology*. Elsevier, Amsterdam, 812 p.