

Buchbesprechungen/Book Reviews

DISSANAYAKE, C.B. & CHANDRAJITH, R. (2009): **Introduction to Medical Geology.** – Erlangen Earth Conference Series, XVI + 297 p., 166 illus., Berlin – Heidelberg (Springer).

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This book illustrates a series of interesting case studies of geo-bio interactions in the tropical realm, an area where over two billion people live – most of them in developing countries. A large number of them is in close contact with the geological environment, obtaining food and water directly from the underground. Thus the geochemical background has a strong influence on their daily life and health. Some diseases have a clear geologic background such as dental and skeletal fluorosis, iodine deficiency disorders, trace element imbalances and so on.

This book, having 12 chapters, is one of the first in this rather young discipline. It serves as an excellent introduction to arise awareness to understand medical geology.

Chapter 1 gives an introduction with historical perspectives and shows some geochemical pathways of trace elements entering the human body (Fig. 1.1.) underlining “We are what we eat and drink”. Chapter 2 (“Geochemistry of the tropical environment”) defines and characterizes these zones, covering approximately 40 % of the earth’s surface. In chapter 3 (“Bioavailability of trace elements and risk assessment”) all aspects of Bioaccumulation, Bioavailability and aspects of epidemiology in medical geology are outlined.

After these introductory chapters some case studies show specific challenges of medical geology. They focus on “Medical geology of Fluoride” (Chapter 4) with case studies from Sri Lanka, India, the east African rift valley and China and inform about defluoridation of high fluoride groundwater; or “Iodine geochemistry and health” (Chapter 5) showing the iodine cycle in the tropical environment as well as the iodine sorption on clays and humic substan-

ces and also effect of microbial activity on iodine geochemistry (case studies from Sri Lanka, India, the Maldives, Vietnam, China and East Africa.

Chapter 6 (“Nitrates in the geochemical environment”) illustrates the nitrogen cycle from various aspects and the effects on methaemoglobinaemia and cancer.

“Medical geology of arsenic” (Chapter 7) shows the presence of arsenic in rocks, minerals, soils and in natural waters as well as arsenic adsorption and desorption. Finally, the geochemical mechanism of arsenic mobility and health effects of arsenic are outlined (case study from the Bengal and Bangladesh basin.

Chapter 8 (“Water hardness in relation to cardiovascular diseases and urinary stones”) shows up the cardio-protective role of calcium and magnesium and characterizes the types of urinary stones (calcium oxalate, calcium phosphate and magnesium ammonium phosphate stones).

Chapter 9 underlines the importance of “Selenium – a new entrant to medical geology” with case studies showing Selenium deficiency diseases in China and Selenium and iodine deficiency diseases in general.

Chapter 10 (“Geological basis of podocniosis, geophagy and other diseases”) points out the risk of ingestion of geomaterials, as it is known from pregnant women in tropical Africa.

In Chapter 11 (“High natural radioactivity in some tropical lands – boon or bane”) indicates the danger of terrestrial radiation in beach sands in Brazil, or some monazite rich beach sands of India as well as high natural radioactivity of the Minjingu phosphate mine (Tanzania) and the high natural background radiation in Yangjiang (China). The last chapter (number 12) is dedicated to underline the need of baseline geochemical data for medical geology in tropical environments including some future prospects for medical geology.

The book closes with an essential sentence: “The human body is only a small part of a larger geochemical cycle – Medicine stands to gain by the proper understanding and application of geology.”

Thomas Hofmann

