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Erratum

In-situ permeability from non-dilatational soil deformation caused by groundwater pumping – a case study

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In Vol. 57, p. 188, left column, line 2, in the first paragraph should read:
the dimensionless quantity $K \cdot t/L$ where L is some character-

Book reviews

Robinson, I.S.: Satellite Oceanography – an introduction for oceanographers and remote-sensing scientists. Ellis Horwood Ltd., Chichester/John Wiley & Sons, 455 p., £ 42.50, 1985

The scope of this book, as described by the author, is "to introduce to marine scientists the fundamentals of satellite remote-sensing over the ocean" (p. 22). He himself is an oceanographer who noticed to wide possibilities and advantages of applying space techniques also in the research of the vertical column of the ocean. Compared to the "classical" ship-born measurements (including instrumented moorings and drifting buoys) here a much wider area of the ocean can be covered.

Thus, in the first section (A), the author reviews the fundamentals of satellite remote-sensing, in the oceanographer's viewpoint. Here, the "possibilities in space" are described – satellites and orbits available, different types of sensors and their capabilities, data transmission, and a survey of the "possibilities for oceanography" seeks to place remote-sensing in the broad context of ocean science.

In the second section (B) specific application areas are examined in more detail, e.g. ocean colour scanners and their application, infrared sensors used to measure sea surface temperature, and passive microwave radiometers. Furthermore the microwave altimeter is described as used to measure the absolute height of the sea surface, which provides an exciting possibility to study large-scale ocean dynamics and tidal motions.

The remainder of the book contains four chapters concerned with the measurement of waves and surface roughness by active microwave devices.

Regarding the scope as mentioned above, this book marks a valuable step towards the use of space techniques in ocean sciences. This is well supported by many references, even up to date. One single disadvantage might be seen in the lack of a chapter on satellites for navigation and positioning. The author himself discusses this point and argues, that "the topic is omitted because it does not offer the oceanographer the fundamentally new vantage point in the sky from which to take a fresh look at the ocean which is the essential subject of this text" (p. 23). Of course, this is true; but mentioning navigation and positioning by satellites might be a suitable way to acquaint the "classical" oceanographer to the use of space techniques, and it would increase the value of the book also for marine geophysicists and geologists!

G. Jentzsch

National Research Council, Geophysics Study Committee: Explosive Volcanism: Inception, Evolution, and Hazard. Ser: Studies in Geophysics. National Academy of Sciences, Washington, D.C., 176 pp., 1984 (Nat. Acad. Press, Washington, D.C.)

"The study on Explosive Volcanism was begun soon after the cataclysmic eruptions of Mount St. Helens. It readily became apparent ... that an assessment of the explosive nature of volcanoes must cover all types of volcanic activity; any volcano can be explosive. Consideration of explosive volcanism must start with the generation of magma. Magma-forming processes are intimately connected with tectonics, and there are pronounced differences in the nature of volcanism between regions of compression and subduction and regions of rifting or broader extension. The cyclic and episodic aspects of volcanic activity form a basis for predicting eruptions and can be sources of information on the rates at which magma and energy are introduced to volcanic systems. Improved understanding of the physics of volcanic eruptions is an exciting goal that is vital to progress in hazard evaluation. Finally the study of explosive volcanism must include an appreciation of the severe social problems that are caused by erupting volcanoes. None is of greater urgency than planning for a crisis. This report considers the progress in research on these aspects of explosive volcanism and the need for additional research efforts."

These sentences are quoted from the Preface since they pretty much cover the whole scope of the book.

For someone nursed in the German earth science scene, it is refreshing to see how here the different earth sciences are united under the heading of geophysics: no territoriality of disciplines but cooperation in the study of explosive volcanism. Of the 13 papers, written by experts (some of them quite young) in their fields, two deal with geochemistry and mineralogy, five with geophysics and physical modeling, two with geology and tectonics, three with volcanology in the strict sense and one with aspects of society and science policy.

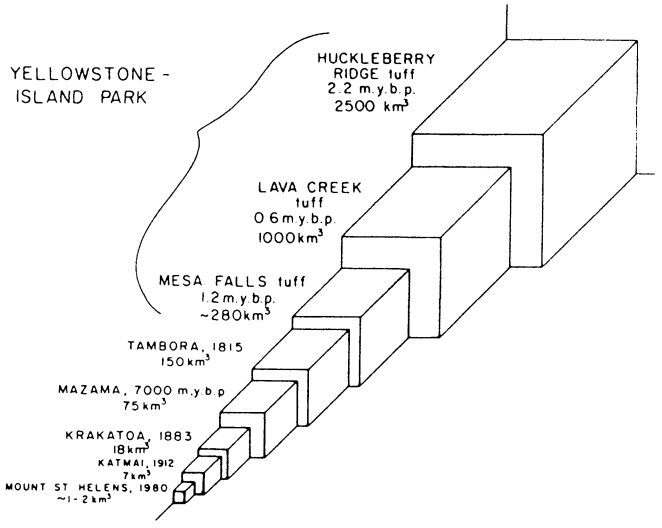

Fig. 7.1. (from Smith and Braile, p. 98) Relative volumes of some wellknown volcanic eruptions (from Williams and McBirney, 1979; Decker and Decker, 1981)

As I would expect from a collection of individual papers, there is considerable heterogeneity, which however will appear different to different readers. Because of the individual nature of the contributions I shall list them here: A.L. Boettcher: The source regions of alkaline volcanoes; R.W. Carlson: Tectonic influence on magma composition of Cenozoic basalts from the Columbia Plateau and northwestern Great Basin, U.S.A.; I.S. Sacks: Subduction geometry and magma genesis; R.L. Smith and R.G. Luedke: Potentially active lineaments and loci in western conterminous United States; B.D. Marsh: Mechanics and energetics of magma formation and ascension; R.L. Christiansen: Yellostone magmatic evolution: its bearing on understanding large volume explosive volcanism; R.B. Smith and L.W. Braile: Crustal structure and evolution of an explosive silicic volcanic system at Yellowstone National Park; T. Simkin and L. Siebert: Explosive Eruptions in Space and time: durations and intervals, and a comparison of the world's active volcanic belts; R.W. Decker and R.L. Christiansen: Explosive eruptions of Kilauea Volcano; Hawaii; J.G. Moore and C.J. Rice: Chronology and character of the May 18, 1980, explosive eruptions of Mount St. Helens; S.W. Kiefer: Factors governing the structure of volcanic jets; K.H. Wohletz and R.G. McQueen: Experimental studies of hydromagmatic volcanism; R.S. Fiske: Volcanologists, journalists and the concerned local public: a tale of two crisis in the eastern Caribbean.

Evidently there is preponderance on volcanism in the United States, but this is justified by the knowledge and experience of the authors; other parts of the world are taken into consideration.

According to my own inclination, I find the paper on mechanics and energetics of magma formation and ascension particularly enlightening. It is a discussion of the thermodynamic and convection aspects of the problem and gives a number of qualifying order-of-magnitude estimates of processes and effects. Very impressed I am also by the two discussions of the Yellowstone volcanic system. Fig. 7.1 of Smith and Braile, reproduced here, puts perspective to the dimensions and powers explosive volcanism can reach, dwarfing the eruption of Mount St. Helens in May 1980. Human history lacks experience with disasters of the Yellowstone type or e.g. of Lake Taupo, New Zealand (not shown in Fig. 7.1). It is thus somewhat frightening to learn that the geological and geophysical observations of crustal structure and evolution give us no reason to believe that Yellostone has ceased to live. In view of the geological time scale involved there is also no reason to panic and there is hope that pending big volcanic explosions will become predictable in the future, although predictions will always involve elements of uncertainty and hardship. It is a curious fact of life, that the most dangerous places on earth mostly are also the most attractive ones.

The aim of the book is to focus attention on explosive volcanism and to give recommendations for future work. Not surprisingly these are mainly that more work needs to be done and that all disciplines must cooperate. One of the fruits may be the 1983 symposium "Calderas and Related Volcanic Rocks: The Krakatau Centenial" published in the Journal of Geophysical Research, Vol 89, Issue B10, 30 September 1984.

The book is well produced and well documented. It is a good introduction to the subject of explosive volcanism and will certainly also serve as a good reference book for the specialist.

W. Jacoby