

Zeitschrift: Bulletin der Vereinigung Schweiz. Petroleum-Geologen und -Ingenieure
Herausgeber: Vereinigung Schweizerischer Petroleum-Geologen und -Ingenieure
Band: 27 (1960-1961)
Heft: 72

Buchbesprechung: Buchbesprechungen

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Buchbesprechungen

Geological Nomenclature (1959)

Edited by A. A. G. SCHIEFERDECKER

Published by the Royal Geological and Mining Society of the Netherlands
Gorinham, Holland; about \$ 9.—

In continuation and improvement of a nomenclature of geological terms in Dutch, this new edition has been prepared by a number of Dutch specialists, in cooperation with some seventy-five colleagues in Europe and the United States. At the same time a glossary and a dictionary, this new volume contains 5489 items with almost no duplications. The listing is arranged with the English term and definition first, followed by the Dutch, the French, and the German equivalent terms or phrases.

The first part (p. 1—350) contains the terms and definitions organized according to the fields of geology, as listed below. As a rule the English term currently used, or the most appropriate one, is printed in bold-face type. Synonyms are placed in successive order of importance behind the preferred term. Then follows a brief definition of the term in English, followed by the Dutch, French and German equivalents (of the term or terms only). When in one of the four languages no equivalent term exists, the space reserved for that language is simply left open. Although normally the leading term is given in the English language, occasionally a typical French or German term has been inserted when only known in that language.

The second part (p. 351—519) is an alphabetical index of all the terms defined and translated in the first part; it lists these terms in all four languages and gives the reference number of the definition and translation in the first part.

The arrangement according to fields of geology bears the marked advantage that the individual fields have been covered and coordinated more homogeneously than in strictly alphabetical glossaries. Also, much duplication has been avoided by offering an exact and ample definition only in English and only for the major terms. Sub-terms are usually only translated and additional definitions are only given, if an additional concept is involved.

To mention an example from geophysics, the term "seismogram" is fully defined, the following sub-terms, which also are not numbered, are only translated: *character*, — of the . . .; perceptible; moderately strong; strong; local, symbol d (*domesticus*); near, symbol v (*vicinus*); distant, symbol r (*remotus*); very distant, symbol u (*ultimus*); sudden beginning, symbol i (*impetus*); gradual beginning, symbol e (*emersio*). Definitions of specific rock terms such as granite, spilite, propylite have been omitted, whereas the processes forming them, e. g. propylitisation, have been defined.

The individual fields are: Geomorphology (1386 terms, including weathering; ground-water hydrology; speleology; rivers; lakes, swamps, marshes, moors; glaciology; oceanography; coasts and islands; reefs); Genetic Physiography (585 terms); Sedi-

mentology (434 terms); Stratigraphy (423 terms); Tectonic Geology (515 terms); Geophysics (369 terms); Vulcanology (821 terms); Orogenesis (145 terms); Mineral Deposits (334 terms); Petrology of igneous and metamorphic rock (469 terms).

As an excellent example of the subdivision of the individual fields the one on mineral deposits may be listed. This collection is, incidentally, unique. It contains: I. General terms. II. Structure and shape of mineral deposits. III. Orientation of mineral deposits. IV. Distribution of values in mineral deposits. V. Processes of formation of mineral deposits. VI. Hypogene rock alterations. VII. Supergene rock alterations. VIII. Cosmo- and geochemistry. IX. Classification of mineral deposits. X. Textures and structures of ore minerals. XI. Various mineral terms. This well organized grouping may serve as a guide in repeating or brushing up on the basic principles of economic geology. The editors of this section are J. Westerveld, University of Amsterdam; E. Raguin, Ecole Nat. Supérieure des Mines, Paris; and Paul Ramdohr, University of Heidelberg.

A close examination of the quality of the definitions has revealed that, on the space used, the definitions are accurate and remarkably free of dogmatic concepts. One may occasionally miss information on the origin of terms and on their etymology. The authors of specific definitions have been indicated in many cases, with the publication date. The printing is clear and virtually no errors could be detected. This new dictionary and glossary can be highly recommended to all geologists as a valuable complementary addition to the AGI Glossary.

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Water Witching U.S.A.

E. Z. VOGT and R. HYMAN (1959)

Univ. Chicago Press (3.70 \$), 248 p., 23 figures

PAULI and great doctors and psychologists like C. G. JUNG and FREUD stated that scientific thoughts, theories and ideas are greatly influenced by images and patterns emerging from our subconscious. We have the tendency to object to this idea if our own thinking is shown to be controlled by, and to a certain degree born out of the unknown depths of our soul. But if we read the new book on «Water Witching U.S.A.», we see that alchemistic concepts are by no means gone and eliminated from geological thinking.

The motto to Chapter I on «Why water witching?» is a quotation on this subject from AGRIGOLA (1556). This chapter explains more why and how the authors became interested in investigating the scientific meaning, the history, the psychology and anthropology of water witching, and also their research procedure.

Chapter II reviews the history of water divining, starting with Moses as «the first water witch», and turns then to the written record beginning with AGRIGOLA's *De re metallica*, from which figure 2 is a reproduction, and to LUTHER's proclamation against the rod in 1518. The spread of the practice is reported to have taken place mainly through German miners in England and through European settlers all over the world. «Witching in our time», «the tools of the trade», «the witching technique» and «some witching folklore» are other topics discussed in the second part of this chapter.

The titles of chapter III: «Does it work? Case histories and field tests», and chapter IV: «Does it work? Controlled experiments», are selfexplanatory. These chapters record in careful but interesting detail various experimental approaches to

the subject. They might be supplemented by the results of the experiments of F. GASSMANN.

Chapters V to IX integrate the important geological relationships discussed in chapter I to IV, with the present knowledge of Anthropology, Psychology and Philosophy. Fortunately the book does not conclude that water witching is not «reasonable» or «scientific». Instead, the authors penetrate the barriers raised in the minds of many «natural scientists» and combine *their* findings with established geological knowledge and thereby reach conclusions which are much more basic and complete than any statistical result alone. A statistical result is but one prerequisite of an integrated conclusion and experience shows that experimental results expressed in numbers alone are not going to eliminate superstition. Such integrated approaches as those by VOGT and HYMANN or by C. G. JUNG in his paper on flying saucers («a modern myth») are critically needed in geology as well as in other sciences.

Chapter V, «From talking horses to talking twigs» contains a comparison of the moving rod with other magic phenomena such as the magic pendulum, Clever Hans of Berlin, table turning, etc. Chapter VI offers an answer to «why does the Rod Move?» as seen from the realms of physiology and psychology. The experiments of such physical scientists as MABY and FRANKLIN (1939) and S. W. TROMP (1949) who explain the «motor behavior of living organisms» with «the action of external electromagnetic fields upon cellular processes, nerve condition...» etc., are also discussed and analyzed, and it is shown that all these pseudoscientific «proofs» contain a long chain of assumptions which are with the one who defends them subconscious and therefore tabu. It is interesting to follow the mechanism of selfprotection if one attempts to show us that a statement we make is an assumption and therefore weak ground. The authors might helpfully have added a few comparisons with examples from some other fields in which sciences become pseudosciences because of intrusions of subconscious contents.

Chapter VII on «Who's who in witching» is an interesting account which goes as far as to offer a table on groups of people «most frequently checked for practice of witching» with a list of «groups most frequently checked as a predominant part of the County». Both lists check with one exception. The following chapter VIII on «for whom the witch tells» discusses the numbers of diviners per 100,000 persons of the ten major ground water regions, and correlates witching with reasons for hiring a diviner and with other variables. The concluding chapter IX describes «Water witching as magical divination». A distinction is made between «series decisions» or «institutional decisions» and the «individual decisions», and it is shown that in «individual decisions» made by a man seeking water in his property the magical factor has a strong influence, whereas in the «series» or «institutional», i. e. usually repeated decision, rational motives are stronger, and probably will be stronger in the future. Thus: whereas «we have reached the conclusion that water witching does not work as a reliable empirical technique to locate underground water» (p. 190), water witching will continue to flourish because individual decisions will always be made with a certain use of magical divination. Other factors are considered and may be illustrated by one quotation: (p. 199) «contrast the clear-cut indications of the rod with the vague suggestions of the scientific geologist. The rod's message is decisive and unambiguous. The geolgist supplies general information but leaves the pinpointing to the consumer. The scientist supplies guidance alone; the diviner relieves the consumer of all responsibilities for choice».

The action of the rod also provides reassurance at a time when the anxious seeker for water most needs it. The scientist, ever honest and ever aware of the fallibility

of his method, qualifies his judgement and does not guarantee success. The water diviner goes about his business with the certitude that comes from blind faith. «These characteristics of the decision to hire a water diviner are cited «because they make plausible our assertion that water witching can be a form of magical (irrational) divination and still be an understandable and psychologically defensible form of action» (p. 202).

«Scientific divination», for example by a geologist, is compared with «magic divination» by a rod man. Although in general the nature of geological information is well understood by the authors who are not geologists, the reader is left uncertain as to whether the true nature of «scientific divination» or, to use a more proper term, «scientific interpretation» is really understood.

The last pages on «water witching and education» may be of interest to educators. This subchapter starts with a quotation from BERTRAND RUSSELL's discussion of «the divorce of science and culture» and ends with a statement that the authors «also feel that knowledge of Chevreul's classic study of the pendulum, Faraday's ingenious investigation of table turning, and Pfungst's painstaking exposure of Clever Hans would alert people to look before they leap to conclusions about the divining rod, the pendulum, the doodlebug, and other devices dependant upon involuntary motor action that still engage the energies and passions of a large portion of our «educated» population» (p. 220).

The reader who is familiar with the wealth of data on similar phenomena, and the methods and principles of interpretation available in the textbooks and studies of analytical and complex psychology, will miss references to these works. A chapter providing a link to the more extensive analyses and interpretations of complex psychology would be useful. The «subconscious memory» (p. 219) is mentioned as playing an important role in many magic actions, but the subconscious archetypic patterns and symbols such as water and fire and precious stones and their impact and influence on our thinking are not mentioned. The shape of the divided rod is itself a symbol which in other instances is believed to have magic properties; for example as wishbone or as bewitched bifurcated roads, etc. The devil is often pictured with a fork, bifurcated horns of animals are often put on roofs or over doors to keep bad spirits away, etc. Such an extended treatment of the subject might have exceeded the intended scope of the book but should probably be mentioned at least in an appendix in a future edition. Reference has been made in this review to JUNG's publication on «the flying saucers, a modern myth». Many of the magic features discussed in the book on «Water witching U.S.A.» are thoroughly discussed and carefully analyzed and grouped in this and such writings of C. G. JUNG as «the archetypes and the collective unconscious»; «Civilisation in transition» (including «the undiscovered self» and «flying saucers»); «Psychology and alchemy» (all in Bollingen Series). «Water Witching U.S.A.» is a valuable sourcebook for studies on archetypes and on the roots of our «conscious knowledge».

The numerous references to geological work and the general interest of the problem of water witching for geologists make this book a most welcome and valuable complementary addition to scientific geological literature on the subject. Its unique importance lies, however, in the integration of the results of a geological and statistical nature with the methods and the knowledge of psychology and anthropology.

Two appendices and a bibliography including (only) 100 references add to the value of the book. The titles of the appendices are: I. «Letter of Explanation and Dowsing questionnaire mailed to County Agricultural Extension Agents» (6 pages), and II. «Water-Well Location by Scientific Divination», by H. E. Thomas, Branch

area chief, Pacific Area, Ground Water Branch, Water Resources Division, U.S. Geol. Survey.

A very worthy feature of the book is its entertaining and pleasantly fluent style, which in places is almost facetious but never crosses the margins permissible for a scientific text and never ridicules. This assures wide reading and should encourage trends toward the more complete and more integrated education which the authors discuss on page 214.

The book is dedicated to the County Agricultural Extension agents of the United States, and its quality and well organized contents guarantee that, through these Agents, it will also reach and change the «magic decision» of many who are basically capable of rational reasoning.

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Veröffentlichungen schweizerischer VSP-Mitglieder in der ausländischen Fachpresse

Hofmann, F. (1960): Prüfverfahren zur Bestimmung der spezifischen Oberfläche, der Kornform und der Kornstruktur von Gießereisanden. — «Gießerei», Heft 3, Düsseldorf.

Laubscher, H. P. (1960): Role of fluid pressure in mechanics of overthrust faulting. — Bull. Geol. Soc. Am., vol. 71, p. 611—616, May 1960.