

BOOK REVIEW

ELEMENTS OF GEOGRAPHICAL HYDROLOGY. Knapp B. J. (1978).
George Allen and Unwin, London England, 85 pp.

This book is presented as a concise introduction to hydrology in a geographical context, aimed to serve the requirements of the English A-level syllabus. The text is divided into two parts. Part one, dealing with theory, consists of two chapters: the first, on processes, deals with elements of the hydrological cycle, and with analysis of stream-flow data; the second, on catchment systems, fits these elements together into the real world. Part two applies the theory to the solution of geographical problems. The three chapters in this section cover soil development and management, slope development, and water resources. These are followed by a glossary, list of further reading and an index.

The theoretical treatment is elementary, and most points are demonstrated by practical examples. A thorough working knowledge of graphs is needed to follow the examples and to solve some problems. There are only two equations in the book, and both contain simple trigonometric functions.

Three prime requirements of a school text are that it presents *factual* material in a *simple, readable* form. This text fails on all three.

I particularly object to Knapp's abuse of the English language that is inexcusable in an educational text. Try for instance "a frequency of only once in a hundred years or less". A classic appears on page seven where we read "when precipitation reaches the ground, it is intercepted. . . . This is of course, why rainfall takes such a long time to reach the ground . . ."

For simplicity, who among us would find it "convenient to consider the land-based part of the hydrological cycle as a linked series of cascading reservoirs"? Who knows what a gleyed rendzina is? You will not find out from this text, but it is labelled in figure 3.9. Then there are hamadas, ergs, and solonchaks and a profusion of other unnecessary and unexplained jargon. Do you want to know what a solonchak is? The woefully incomplete glossary is no help. I dispute 16 of the 43 entries in the glossary. "Base flow" is "the low flow in a river due to ground water and slow throughflow, which occurs when there has been no rainfall for a prolonged period", but figure 1.12 shows base flow occurring throughout a storm hydrograph. "Recession" is "the decline in river flow after the storm contributions have passed"; I thought it was the decline in river flow after the storm. "Shear strength" is defined as the force that resists a shear stress. There are obvious problems when "factor of safety" is defined as the ratio of shear stress to shear strength.

For facts, "it is worth remembering that one metre of snow is equivalent to only eight centimetres of rain", but don't bother in New Zealand. On page six and seven, *the* major component of the general global circulation is omitted in an erroneous oversimplification, leaving the reader to infer incorrectly that the "fronts" of the text are the "polar front" of figure 1.2. On page 25 glaciers are described as the last vestiges of the Quaternary cold periods, and another popular misconception is perpetuated in "much erosion was accomplished by fluvial action as ice sheets melted at the close of each cold period". There must be a typographical error on page 26 where the Engabreen catchment has a hydrograph peak of 5.2×10^6 cumecs off 39 km² for 125 mm of rain!

Even the index suffers. "Solonchak" has two page entries listed, but the term appears only in one of them. On page 47 a sentence refers to "fairly high *effective* rainfall" (reviewer's italics). A glance at the index refers the reader to page 14. Here one finds "**unit response graph** . . . the hydrograph of storm runoff (without base flow) that is produced by a storm of known *effective* rainfall" (reviewer's italics). The inspired reader who glances at figure 1.12 might be able to relate the text to the small section labelled "rainfall effective in producing runoff".

Overall the poor writing fails to gain, let alone hold, the reader's interest, so the wealth and variety of the excellent practical examples are to no avail. I cannot recommend this text.

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PUBLICATIONS RECEIVED

Gheorghe, A.: "Processing and Synthesis of Hydrogeological Data", English Edtn, 1978. Abacus.

Massey, B. S.: "Mechanics of Fluids", 4th Edtn, 1979, Van Nostrand Reinhold.