

Nuggets from an old book: *A Practical Handbook of Water Supply* by F. Dixey (1931)

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Frank Dixey's A Practical Handbook of Water Supply, published in 1931 is briefly reviewed. The text is correlated with current knowledge and experience. It is evident from the book that some of the present challenges in the water supply sector have been around for a long time which leads to the conclusion that effecting a change takes time. Development agencies therefore need to set realistic targets and time frames. Some of the rather old texts should be consulted and reviewed periodically as they may contain very useful information.

Keywords: book review, groundwater supply, surface water supply, professionalizing of drilling

ON A RECENT TRIP TO THE UK, I visited my 89-year-old friend, Robin Hazell, and his wife, Ursula, in their cottage in Bodmin, Cornwall. Robin is among the first generation of groundwater specialists. He had been employed by the British Colonial Government in the Geological Survey of Nigeria, and subsequently worked as a consultant in several countries in a career that has spanned almost 70 years. Robin asked me to help myself to any of the books in his library, as due to advancing age, he was unlikely to make use of them again.

One of the several gems I picked up was Frank Dixey's *A Practical Handbook of Water Supply*, published by Thomas Murby and Co. London in 1931. Frank Dixey was a geologist in the British Colonial Office early in the 20th century and worked in several African countries. Robin said the book was one of the only two books available on the subject of groundwater (the term 'hydrogeology' was yet to be coined) when he began his career in the 1940s.

The 571-page book covers water resources in general, surface water supply, groundwater supply, and the water supply conditions in six countries. Probably underscoring the importance of groundwater in water supply, and the bias of the author, 389 pages are devoted to groundwater supply while 123 pages cover surface water supply. From first-hand experience, Dixey describes the water supply conditions in South Africa, South Rhodesia (present day Zimbabwe), Nyasaland (present day Malawi), Tanganyika (present day Tanzania), Kenya, and Uganda.

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<http://dx.doi.org/10.3362/1756-3488.2017.006>, ISSN: 0262-8104 (print) 1756-3488 (online)

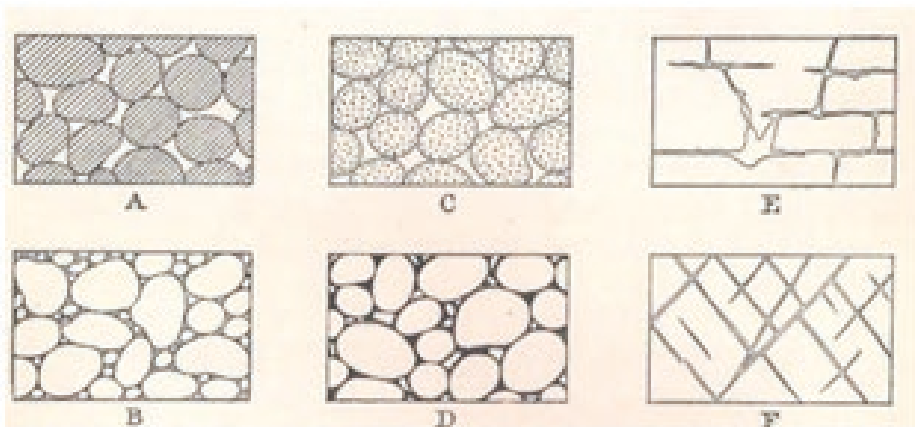


Figure 1 Diagram showing several types of rock interstices and relation of rock texture to porosity

Going through the book, one is amazed at how much was already known at the time when the book was written. For example the Rural Water Supply Network (RWSN) recently developed a training module titled 'Understanding Groundwater without Jargon' for the benefit of non-technical people involved in rural water supply. Dixey did the same 80 years ago. The preface to the book states that the 'practical aspect of retaining or of recovering water is treated mainly from the point of view of settlers, missionaries and administrative officers who are faced with the necessity of developing small supplies although inexperienced in such work'. Thus, the language of the book is very simple throughout. Instead of 'precipitation', it simply states 'rainfall'. Instead of terms like aquifer, aquiclude, or aquitard, it says 'rocks may be classified as water bearing or non water bearing or more correctly as water yielding or non water yielding'.

The illustration of porosity of rocks in Figure 1, which has appeared in virtually every groundwater publication over the years, also appears in the book. The book attributes the drawing to O.E. Meinzer (1923).

It can be deduced from the book that some of the current challenges in ensuring cost-effective water supply boreholes, such as the professionalizing of water well drilling, have been around for some time. Dixey says, 'boring must be carried out by those accustomed to the work' and that, 'the employment of a first class boring supervisor of experience is essential'. He goes on to say that, 'it is of great importance that a geological report should precede efforts to obtain permanent water supplies and not as so frequently happens be asked after one or more costly attempts have failed'. He uses the expression 'permanent water supply'. Today we would say sustainable water supply but permanent is a stronger and more affirmative word. He argued against water divining because 'it may lead to serious waste of time and money'.

He addresses the question of whether or not to pay for dry boreholes; a controversy that rages on today. He lists the four methods of payment being used for drilling contracts as:

- cost per foot;
- cost per borehole delivering a specified quantity of water: no water – no pay;

- cost per day of boring;
- actual cost plus a percentage.

He says, 'with regard to the second method, very few contractors will take it on except at very high prices with the right to choose their own site which is usually the cheapest but often not the most desirable spot'. This is still the situation today.

In June 2016, at a meeting at Queens University, Belfast, Northern Ireland, Professor Alan MacDonald of the British Geological Survey gave a paper on the relationship of igneous intrusions into fractured shales and groundwater occurrence. Dixey in the handbook makes similar observations and conclusion on the subject as Alan's paper. When I mentioned this to Alan, he commented that it seems our generation is rediscovering things which were already known to the older generation.

That some of the challenges of today have been around for quite some time could be an indication that it takes a long time to effect a change and for development to take place. However, development agencies need not despair but should adopt more realistic time frames in their planning.

Also in these days of internet search engines, there is still some merit in looking at the dusty old books in the library; they may contain nuggets of wisdom and relevant information so that resources are not wasted reinventing the wheel.

Reference

Meinzer, O.E. (1923) *The Occurrence of Ground Water in the United States*, U.S. Geological Survey Water Supply Paper 489, Washington, DC: Government Printing Office.