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SOIL DESCRIPTION HANDBOOK - Revised Edition by J.D.G. Milne, B. Clayden, P.L. Singleton & A.D. Wilson

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Reviewed by David J. Lowe and Megan R. Balks
Department of Earth Sciences, University of Waikato, Private Bag 3105, Hamilton

Introduction: Background to the Revised Edition

The original edition of *Soil Description Handbook* (SDH) by Milne et al. was published in 1991 by DSIR Land Resources with the stated aim (p. 9) of replacing the system of description of Taylor and Pohlen (1979). A detailed review of the SDH was published in *Soil News* by Jim Pollok (1992). Ben Clayden (1992) replied to many of Pollok's criticisms in a subsequent issue. The impetus to produce a revised edition of SDH arose in part because the original edition had sold out and the publishers felt that there was sufficient demand, chiefly from the universities, to justify another printing. Various suggestions to improve the SDH were made at this time, and so Allan Hewitt and Ben Clayden sent a questionnaire to pedologists and other soil scientists asking for proposed changes to be forwarded to them for collation. Subsequently, Hewitt and Clayden convened a soil classification workshop at the New Zealand Society of Soil Science conference at Lincoln University on 22 November, 1994, where the proposed modifications were outlined and debated. The final stages of revising and editing were carried through mainly by Ben Clayden with help from Allan Hewitt. The revised edition, although with a publication date of 1995, became available in early February this year after printing delays.

Presentation

The revised SDH is, like its predecessor, A5 in size (210 x 148 mm) and has a bright green, semi-glossy, (hopefully) hard-wearing cover dominated by the word 'Soil' in large letters formed from a black-and-white photograph of part of a 'layered' soil profile. The contents parallel those of the original edition, except that the section on macrofabric precedes the section on consistence: *Foreword* (p. 7), *Introduction* (p. 8), *Reference Data* (p. 8-9), *Site Data* (p. 9-34; includes Introduction, Location of profile observation, Annual precipitation, Elevation, Geomorphic position, Erosion/deposition, Vegetation, Land use and land-management practices), *Soil Data* (p. 35-93; includes Nature of described sample, Horizon depth, thickness and boundary transitions, Soil-water state, Soil colour, Particle-size distribution, Macrofabric, Soil consistence), *Parent Material and Substrate* (p. 94-96), *Acknowledgements* (p. 96), *Appendices* (p. 97-149; there are eleven), *References* (p. 150-152), and *Subject Index* (p. 153-157). A new feature is the inclusion of soil description data sheets in a pocket inside the back cover.

Comments

As stated in the handbook's Foreword, there have been minor amendments and additions to the original edition including some new or revised tables (e.g., the table on plasticity now has four classes instead of three) and figures (including new flow charts), minor additions from the new *Soil Survey Manual* of the USDA (Soil Survey Division Staff 1993) to help conform with globally-accepted nomenclature, and alterations to the text to improve clarity. Most of the modifications discussed at the Lincoln workshop have been incorporated, with the major change being the vastly improved layout and the inclusion of an alphabetical subject index. Finding the right page is further simplified by the addition of page headers throughout and of grey marker tabs on the page margins. The presentation of the text, tables, and figures is very crisp and clean. We have found only one typographic error: the flow chart on p. 80 asks 'Can a sample be *found...*' instead of *formed.*

The development of the flow charts is another feature of the revised edition. For example, there are flow diagrams for assessing soil texture, identifying peds (etc.), identifying apedal material, and for determining whether soil material is cohesive or not. All are worthwhile and useful for teaching purposes. However, we found some difficulties when we tried out the texture flow chart (p. 50-51) on our Northland pedology field trip (comprising third-year undergraduate students) in March this year. One problem is that the chart attempts to deal with both texture *groups* and texture *classes*, which is confusing. Some students kept ending up with loamy silts (by answering 'Yes' to the question:

'Does the soil feel slightly gritty and/or slightly sticky?') rather than going on to the (correct) clayey classes. An ironical point here is that we have used a similar version of the flow chart for some years at Waikato University seemingly without such problems, yet our flow chart forms the basis of the one in the revised SDH! Maybe we need to check the wording very carefully after a bit more trial and error and to look at rearranging the procedural order of the chart.

There are three new appendices. Appendix 3 (p. 102-103) provides a recommended procedure for soil-profile description. Some of our students on the Northland trip followed this; others used their own system. Appendix 11 (p. 132-147) is essentially a copy of Clayden and Hewitt (1989) but with minor modifications (e.g., the section on lithological discontinuities has been changed slightly). The inclusion in SDH is welcome and reduces by one the number of field books needed to be carried around by today's pedologist. Appendix 12 (p. 148-149) lists soil drainage classes (curiously absent from the original edition), which are based on the hydromorphic classes developed for Hewitt's (1992) New Zealand Soil Classification (see Appendix in Hewitt 1993).

The inclusion of the soil description record cards is a good move – these cards (or rather, photocopied versions of them) proved popular with our pedology class on the Northland field trip. One of the cards is a key to computer codes. The essential cards can be photocopied onto a single A3-sized sheet, which is convenient for recording information in the field and keeping it all together. We would find it helpful if texture, macrofabric, and consistence were all on one card as we tend to deal with them together, but that's only our preference. One problem with the cards is that they tend to fall out of the book very easily. This is because the pocket inside the back cover is not large enough to keep them in place.

A final suggestion: the term 'Agroforestry' could be added to the section on land use (p. 32-33).

Conclusions

We are pleased to see the revised edition of SDH and strongly commend Ben Clayden and Allan Hewitt, and Greg Comfort (Manager, Manaaki Whenua Press), for their efforts in seeing the handbook through to publication. The terms and methods are becoming more familiar to us since we started using the original version around three years ago, and the revised edition is considerably easier to use through better layout and other improvements, some of which are noted above. It is still a comprehensive and daunting document, maybe even frightening to some people (as noted by Ben Clayden in correspondence to us in 1995), but we would emphasise that a rational attitude to it helps overcome such inhibitions – we are quite selective in which properties we get our students to describe, and the degree of detail they achieve depends on their experience and the time available. Pollok (1992) rightly stated that the (original) handbook is essentially one of definitions, creditably gathered together between one set of covers, but at the same time warned that there is a danger 'that the definition of a soil property will be mistaken for the truth about it' and that 'our soil properties are smoothed out to a degree by having to conform to their corresponding definitions'. We see the point and appreciate that 'innocent, unbiased observation is a myth' (a quote ascribed to Peter Medawar in Paton et al. 1995). Indeed, Charles Darwin (quoted in Paton et al. 1995, p. 87) stated:

> 'About thirty years ago there was much talk that geologists [read pedologists today] ought only to observe and not theorize; and I remember someone saying that at this rate a man [or woman] might as well go into a gravel pit and count the pebbles and describe the colours. How odd it is that anyone should not see that all observations must be for or against some view if it is to be of any service.'

Furthermore, Ernst Mayr (quoted in Paton et al. 1995, p. 129) stated:

> 'One cannot arrive at explanations without using one's own personal judgement and this is inevitably subjective. A subjective treatment is usually far more stimulating than a coldly objective one because it has a greater heuristic value.'

But we would argue that description (observation) is surely necessary to any credible explanation or end point, whether that end be a (subjective) genetic interpretation of a soil, or a soil management strategy. The SDH is a means to an end, not an end in itself. Clayden (1992, p. 100) stated that:

> 'The [original] handbook was prepared to provide a comprehensive and definitive system for soil description that could be pruned or otherwise adjusted to meet the operational requirements of the specific project. Genetic interpretation was avoided and priority given to objective description, in the manner followed by the true naturalist.'

In any event, and irrespective of philosophical viewpoint, the revised SDH has made soil description more objective than previously, especially when used in conjunction with Hewitt (1992), and deserves a lot more use in the field and promotion to the wider soil community.

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