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To advance the science and art of good land use

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Cover: Water quantity and quality issues are in the spotlight. See pages 312, 325, 333, and 335. Soil Conservation Service photo by Ron Nicols.

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The Soil and Water Conservation Society is dedicated to promoting the science and art of good land and water use worldwide, with emphasis on conservation of soil, water, air, and related natural resources, including all forms of beneficial plant and animal life. To this end, SWCS seeks through the *Journal of Soil and Water Conservation* and other programs to educate people so that mankind can use and enjoy natural resources forever.

PEN POINTS

The T-value debate goes on

Anyone who has investigated the research supporting T-values is aware that the evidence is contradictory and sometimes vague. Leonard Johnson's lucid presentation [*JSWC*, May-June 1987, pp. 155-160] of just how contradictory and slippery this research is is a timely contribution, given the current high level of interest in soil and water conservation programs and practices. While T-values are a useful guide to the relative tolerance of a particular class of soils for water erosion, we clearly need, as Johnson and others have suggested, to develop some other mechanism for assessing "permissible" rates of soil erosion.

Neil MacGaffey
Plangraphics, Inc.
Frankfort, Kentucky

Leonard Johnson provided an interesting review of soil conservation citations on the rate of soil formation from bedrock [*JSWC*, May-June 1987, pp. 155-160]. Many of the citations were traced back to T.C. Chamberlin's 1908 estimate or to Hugh H. Bennett's speculation. We no longer need to rely on those sources. Data collected in the last 25 years have been analyzed to obtain a reliable range of soil development rates [*Physical Geography*, vol. 6, pp. 25-42]. Rates of soil development from bedrock are on the order of 0.5 Mg/ha yr (0.2 ton/acre/year) in humid climates. They range from <0.1 Mg/ha yr for siliceous plutonic rocks to >1.0 Mg/ha yr for some calcareous clastic sedimentary rocks. Assuming a soil bulk density of 1.2 Mg/m^3, Chamberlin's estimate of one inch of soil formed in 1,000 years is 0.3 Mg/ha yr (0.14 ton/acre/year), a very well-educated "guess."

E. B. Alexander
Forest Service
Juneau, Alaska

A hand-out paper from a poster presentation on "Soil Loss Tolerance" at SCSA's recent annual meeting in Billings, Montana, by Loyal A. Quandt asserts, "The rate of formation of subsoils from underlying strata is a key factor in determining permissible rates of erosion."

Considering how little we truly know about the rates of development of soil material from parent material, such a statement should give cause for profound consternation in the minds of soil conservationists.

Soil loss tolerance (in other words, the permissible rate of erosion) was defined in Quandt's paper as "...the maximum rate of annual soil erosion that will permit crop productivity to be sustained economically and indefinitely." Setting aside for the moment our inability to determine presently what may be economical 1,000 (or even 100) years hence, it is instructive to consider the substance of SCS [Soil Conservation Service] guidelines for setting tolerable soil loss (T) values, as described in the above-referenced paper.

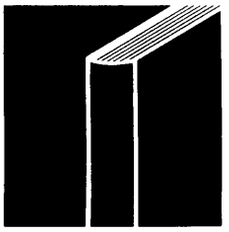
It appears that the soil property which almost exclusively determines permissible rates of soil erosion is the overall depth of soil profile amenable to plant root penetration and proliferation. This concept of the soil properties that serve to promote and sustain vigorous and profitable plant growth completely discounts the vital functions of a properly husbanded and biologically active topsoil in promoting favorable physical and chemical edaphic conditions in the all-important soil zone of seed germination and seedling emergence, establishment, and growth. I hope that this apparent attitude represents only a limited and momentary aberration. And that soil scientists as a class are not inclined to redefine agricultural soils as more-or-less inert porous bodies of inorganic materials to which crop production technologies must as a regular practice add chemical salts to compensate at least for the mineral nutrient release and storage functions that formerly were performed by the now degraded and abandoned topsoil.

It was noted in Quandt's paper that the plant nutrients (total P and K, one assumes) in a ton of soil have an average value of $6, and that a loss of such nutrients through erosion *amounting* to $30 per acre (annually, presumably) is considered excessive. By way of historical comparison, an interagency committee on permissible soil loss meeting at Purdue University in 1956 estimated these values at $2 per ton and $10 per acre, respectively. But they came to the same speculative conclusion on the basis of a subjective assessment of contemporary economic conditions and farmer judgements, and recommended that the maximum permissible annual soil loss should be five tons per acre. Neither total rooting depth nor topsoil depth entered into this purely short-term economic determination.

Quandt expressed a hopeful view of the future, stating, "We will learn even more in the future about the rates of soil formation...and methods of tillage that will hold soil erosion to a minimum." Let us pray earnestly that we will learn much, much more about rates of soil development and openly and honestly admit how little we now know.

Leonard C. Johnson
Troy, Idaho

"Pen Points" is a forum for comment on published material or land and water management issues in general. Readers are invited to express their views in a letter to the editor. Letters are judged on their clarity and pertinence. Long letters may be shortened.—Editor.



BOOKS, ETC.

Earth: The Stuff of Life. By Firman E. Bear. Second Edition. Revised by H. Wayne Pritchard and Wallace E. Akin. 318 pp., illus., 1986. University of Oklahoma Press, Norman, 00000. $19.95.

Firman E. Bear, noted soil chemist, was a professor of agricultural chemistry, editor-in-chief of *Soil Science*, and a well-known author in his field. In the first edition of *Earth: The Stuff of Life* published in 1962, he had a vision of what the world would be in the future, and he was concerned for the renewable resources of the earth and their ability to maintain our standard of living for a growing population.

Twenty-four years later, Firman Bear's classic treatise on soil has been revised by H. Wayne Pritchard, former executive vice-president of the Soil Conservation Society of America, and Wallace E. Akin, professor of geography and geology, Drake University.

Commenting in the preface to the second edition, Pritchard and Akin state: "This book in the original edition was his [Bear's] attempt to bridge the gap between the scientist and the lay leader." In the new edition the authors have tried to retain Bear's original theme of the book. This is a popular introduction to soil science for the lay person, although it will also interest professional resource managers and environmentalists. The new edition also retains Firman Bear's writing style and incorporates new information on many topics.

The concern of this book is the planet earth in the broadest sense, with the primary consideration being the United States in relation to other nations and cultures of people. The 38 illustrations have been carefully selected to enhance the reader's understanding of principles and concepts. For example, chapter one, "The Soil Beneath Our Feet," contains seven figures, including maps, depicting soils of the world on various continents.

The book emphasizes that the land of the earth constitutes our most valuable natural resource; however, consideration is given to all natural resources. Attention is given to global land use and the capability of the planet to provide for the needs of the projected population growth.

Ecological succession is briefly described and related to the evolution of agriculture, including the rapid changes that have occurred as a result of man's activities. Important topics discussed include the transition from the use of horses and mules as the primary source of energy to tractors, trucks, and automobiles, which are primarily nonrenewable energy. Changes in land use from prime farmland to the use of land for factory sites, highways, subdivisions, and recreation frequently were accompanied by flooding and accelerated erosion.

The expansion of irrigation, lowering of water tables, and degradation of water quality are presented as important resource management problems. Other significant, contemporary environmental challenges discussed include air pollution and acid deposition, destruction of tropical rain forests, siltation of reservoirs, overgrazing, and desertification.

Throughout this edition the need for practicing conservation is stressed, including the role of Hugh Bennett as a pioneer in the soil and water conservation movement. A number of soil and water conservation practices are explained and illustrated. Selected governmental conservation programs in the United States are described, including those of the National Park Service, Forest Service, Soil Conservation Service, and the Environmental Protection Agency. On the global scene the activities of the Agency for International Development are described.

Throughout this new edition the authors describe changes that have occurred since the first edition was published in 1962. More attention is given to "developing countries" and "Third-World countries." The authors conclude by stating, "Past civilizations...have declined because they have neglected the land, and in some countries today much neglect is only too evident. Next to preventing a nuclear holocaust, saving the land for future generations may be humankind's greatest responsibility and opportunity."

An expanded and updated list of supplementary readings provides an opportunity for the reader to pursue topics presented in this book in greater depth.—*CLYDE W. HIBBS, Department of Natural Resources, Ball State University, Muncie, Indiana.*

Pollution

Toxic Substances in Agricultural Water Supply and Drainage—Defining the Problems. Proceedings, 1986 Regional Meetings. Joseph B. Summers and Susan S. Anderson, Editors. 372 pp., 1986. United States Committee on Irrigation and Drainage, P.O. Box 15326, Denver, Colo. 80215. $43.00.

Proceedings, Detection, Control, and Renovation of Contaminated Ground Water. Edited by Norbert Dee, William F. McTernan, and Edward Kaplan. 226 pp., 1987. American Society of Civil Engineers, New York, N.Y. 10017. $22.00.

From Pollution to Prevention. 64 pp., 1987. U.S. Government Printing Office, Washington, D.C. 20402. $2.75.

Law, Legislation and Politics

Impacts of the Conservation Reserve. 34 pp., tbls., apps., gloss., 1987. American Farmland Trust, 1920 N. St., N.W., Suite 400, Washington, D.C. 20036.

Law of Environmental Protection. Sheldon M. Novick, Donald W. Stever, Margaret G. Mellon, Editors. (2 volumes). 1987. Clark Boardman Co., Ltd., New York, N.Y. 10014. $175.00.

Great Lakes Water Law—From Basin to States: Broadening the Perspective. 1987. National Conference of State Legislatures, Denver, Colo. 80265. $8.00.

Forests

The Return of the Poplar. Streamland 52. Leaflet, illus., 1987. Technical Information Section, Water and Soil Directorate, Ministry of Works and Development, P.O. Box 12041, Wellington North, New Zealand. $.55.

Willows for the Future. Streamland 53. Leaflet, illus., 1987. Technical Information Section, Water and Soil Directorate, Ministry of Works and Development, P.O. Box 12041, Wellington North, New Zealand. $.55.

Wildfire Strikes Home! 89 pp., illus., 1987. National Fire Protection Association, Quincy, Mass. 02269.

Nebraska's Second Forest Inventory. By Gerhard K. Raile. 87 pp., illus., tbls., refs., app., 1986. Resource Bull. NC-96. Forest Service, St. Paul, Minn. 55108.

Natural Management of Tropical Moist Forests: Silvicultural and Management Prospects of Sustained Utilization. Edited by Francois Mergen and Jeffrey R. Vincent. 212 pp., 1987. Yale University, School of Forestry and Environmental Studies, New Haven, Conn. 06511. $10.00.

Ecology, Silviculture, and Management of the Engelmann Spruce—Subalpine Fir Type in the Central and Southern Rocky Mountains. By Robert R. Alexander. 144 pp., illus., refs., apps., 1987. Agr. Handbk. No. 659. U.S. Government Printing Office, Washington, D.C. 20402.

A Framework for Identifying Public Research Priorities: An Application in Forestry Research. By Glenn Fox. 21 pp., illus., refs., 1986. Gen. Tech. Rpt. NC-109. North Central Forest Experiment Station, St. Paul, Minn. 55108.

Soils

Soil Mechanics. By R. F. Craig. (4th edition). 410 pp., illus., refs., index, 1987. Van Nostrand Reinhold, New York, N.Y. 10003. $24.95.

Soil Improvement—A Ten Year Update. Proceedings. Edited by Joseph P. Welsh. 340 pp., 1987. American Society of Civil Engineers, New York, N.Y. 10017. $30.00.

Introduction to the Principles and Practice of Soil Science (second edition). By R. E. White. 244 pp., illus., refs., index, 1987. Blackwell Scientific Publications, Inc., Palo Alto, Calif. 94301. $25.00, paperback; $45.00, cloth.

The Economics of Soil Erosion: A Handbook for Calculating the Cost of Off-Site Damage. 135 pp., illus., bibliog., app., 1986. American Farmland Trust, Washington, D.C. 20036.

Proceedings, Engineering Aspects of Soil Erosion, Dispersive clays and Loess. Edited by C. W. Lovell and Richard L. Wiltshire. 176 pp., 1987. American Society of Civil Engineers, New York, N.Y. 10017. $18.00.

USDA—Water Erosion Prediction Project (WEPP). 43 pp.,, apps., 1987. Executive Director, Board on Agriculture, National Research Council, Washington, D.C. 20418.

A Methodology for Erosion Hazard Mapping of the SADCC Region. By Michael Stocking. 33 pp., illus., refs., app., 1987. Report No. 9. Soil and Water Conservation and Land Utilization Programme, P.O. box 24, Maseru, Lesotho.

Anatomy, Physiology, and Psychology of Erosion. By E. G. Hallsworth. 176 pp., illus., tbls., app., index, 1987. John Wiley & Sons, Inc., Somerset, N.J. 08873. $49.95.

Pesticides

Western Spruce Budworm. 198 pp., illus., refs., gloss. apps., index, 1987. Tech. Bull. No. 1694. U.S. Department of Agriculture, Washington, D.C.

1987 Newly Revised Insecticide, Herbicide, Fungicide Quick Guide. 1987. Thomson Publications, P.O. Box 9335, Fresno, Calif. 93791. $14.50, plus tax.

The 1987 Pesticide Directory. By Lori Thomson Harvey and W. T. Thomson. 1987. Thomson Publications, P.O. Box 9335, Fresno, Calif. 93791. $75.00, plus tax and freight.

Regulating Pesticides in Food. 272 pp., tbls., apps., index, 1987. National Academy Press, Washington, D.C. 20418. $19.95.

Fish and Wildlife

Techniques for Studying Nest Success of Ducks in Upland Habitats in the Prairie Pothole Region. By Albert T. Klett, Harold F. Duebbert, Craig A. Faanes, and Kenneth F. Higgins. 24 pp., illus., refs., apps., gloss., 1986. National Technical Information Service, Springfield, Va. 22161.

Lethal Dietary Toxicities of Environmental Contaminants and Pesticides to Coturnix. By Elwood F. Hill and Michael B. Camardese. 147 pp., illus., refs., apps., 1986. National Technical Information Service, Springfield, Va. 22161.

Effects of Vegetation Manipulation on Breeding Waterfowl in Prairie Wetlands—A Literature Review. By Harold A. Kantrud. 15 pp., illus., refs., 1985. National Technical Information Service, Springfield, Va. 22161.

Platform-Island Nesting Structures for High Waterfowl Production: A Demonstration Project. By Rodney D. Sayler. Natural Resource Manage. Bull. No. 1. Institute for Ecological Studies, University of North Dakota, Grand Forks, 58202.

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11. I certify that the statements made by me above are correct and complete.—*Larry D. Davis, Acting Executive Vice President, Soil and Water Conservation Society.*