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Cover

Many farmers and ranchers seek to link conservation and productivity (see page 186), as has Tom Amery of Lyle, Washington, with this stand of alfalfa-wheatgrass seeded on marginal land. View from pasture includes Mount Hood. Photo by John Walter.

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

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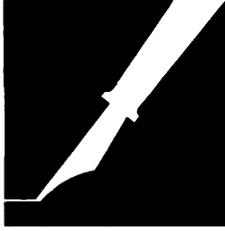
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PEN POINTS

A cure for ailing Mother Earth

It is troubling to me as a layman to read "Soil Erosion Effects on Soil Productivity..." (JSWC, March-April 1981, pp. 82-90). Mother Earth is dying because of "irreversible exponentially increasing erosion," and the doctors in charge prescribe more of the biocide, petrofertilizers, pesticides, and herbicides that destroy the biolife and humus in the soil, subjecting it to erosion—and further monitoring of the patient's deterioration will be documented.

Increasing public concern—Readers Digest articles, "Where Has All Our Soil Gone," and others—will demand answers from the academicians represented by your journal as to who is to be held accountable for the *holocaust in the soil*.

I offer a different type of study model for the benefit of your readers, contributors, and society in general. Assuming the worst—that agribusiness would complete the destruction—I started with a cadaver—two-tenths of an acre of powdery clay subsoil with rocks and zero organic matter that previously had a sparse, scrubby pine cover and would grow nothing.

Using no pesticides, no petrofertilizers, no herbicides, and no animal manures, in two years I transformed this into 500-bushel-per-acre crop yields and 2 percent organic matter using only the body wastes of two human beings processed into four tons per year of worm castings from our waterless vacuum home waste recycling system.

Instead of losing to erosion six bushels of soil per bushel of produce, I add one bushel of worm castings per bushel of yield. I will probably achieve the world's first 1,000-bushel-per-acre crop yield when I get to 5 percent organic matter in a year or two. Invertebrate and microflora attain levels that neutralize pest populations and immunize the soil to erosion.

The Mother Earth is not old and dying. She is young and has been ravished but will respond incredibly when manured as the good Lord intended.

Americans are capable of producing 400 million tons of worm-casting fertilizer with waterless vacuum systems. And this is how we will restore the fertility of Mother Earth, the purity of our food and water chain, and insure the

perpetuation of the species.

Surely someone in the Department of Agriculture must understand that 225 million humans cannot take, take, take from the bosom of Mother Earth and not give. The truths of nature are irrefutable: *Soil fertility must be maintained by the manures of the mobile creatures who take sustenance.*

The good Lord never intended that we use flush toilets. Are you still using one? It is the seed of your destruction.

Jeremy Criss
Sykesville, Maryland

Conservation's time has come

Why is it that we seem so bent on determining the exact extent of soil erosion and the resultant damage to productivity that we are willing to sacrifice our valuable resource while we study the problem over and over? Forty years ago we in this country decided soil erosion was happening at such a rate as to warrant the allocation of one-sixth of the national budget to stop it. For 40 years we have tried to determine how much erosion we have and what harm it is causing. While we were studying, approximately one-half of the topsoil we had has eroded away. If we are going to spend another 40 years before we find the solution, we may be too late to use it.

Soil erosion and the water pollution it causes are the result of uncontrolled surface runoff of rain. We have attempted to deal with the problem through federal and in some instances state programs in the past. Where we have dealt directly with the problem, we have had success. It is in the area where we have attempted to deal with it indirectly that our failures have occurred. When we have attempted to dictate or control cropping sequence, tillage practice, or other management concepts, advances in technology and changing economics have outdated our programs before we have been able to get acceptance of them.

Since the changes will continue and demands for the products of American agriculture will continue to grow, it should be evident that the solution is not through restrictions of the use of the

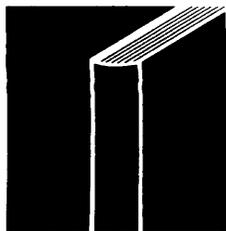
land. The answer lies in controlling erosion and the resultant pollution in a way that allows as much freedom for the use of the land as possible. In doing so, we encourage the expertise and innovation that are built into the American free enterprise system, which has served us so well in the past. What is needed is a broad program of runoff control that deals with the problem where it starts and is carried out to the highest practical level (containment of a 10-year frequency rain).

Secretary of Agriculture John Block has implied that the control of erosion through the use of permanent structures is cost-prohibitive. While a case can be made to prove such a program is not economically feasible for the individual farmer (see JSWC September-October 1980, pp. 233-236), a strong case can be made to justify public funding of this approach. Not only is the public interest in continued productivity at stake, but surface water pollution, depletion of our aquifers, and construction and maintenance of our road systems.

We have already spent billions of dollars in public funds to control point-source water pollution while largely ignoring nonpoint pollution. We have spent billions of dollars creating artificial water flows to irrigate cropland while allowing much of the rainfall provided to run off freely when it could be absorbed into our water table. We also find ourselves in a serious problem with bridges on our secondary road system, many of which could be eliminated and all of which could be largely reduced in size by controlling the surge of runoff occurring during and immediately following rains. Millions more are spent each year dredging our rivers and harbors. Damage to the reservoirs behind many of our dams goes beyond calculation. All of this because we have been unwilling to admit to the obvious.

In China and many other countries, the demand for food has forced acceptance of what we try to deny. I hope we do not put off accepting until we who have lived in the midst of plenty are forced to accept it by starvation. *It is time now to act.*

Ronald Gahring
Gahring Construction, Inc.
Williamsburg, Iowa



BOOKS, ETC.

Soil and Water Conservation for Productivity and Environmental Protection. By Frederick R. Troeh, J. Arthur Hobbs, and Roy L. Donahue. 718 pp., illus., refs., tpls., maps., apps., index, 1980. Prentice-Hall, Inc., Englewood Cliffs, N.J. 07632. \$24.95.

Anyone interested in conserving soil and water resources will find *Soil and Water Conservation for Productivity and Environmental Protection* to be informative, comprehensive, and enjoyable. The book can be used as a text for college courses in conservation, a handy reference for conservation technicians, or a highly readable introduction to soil and water conservation for the layman.

The authors' expertise is evident throughout the book. Drs. Troeh and Hobbs are professors of agronomy at Iowa State University and Kansas State University, respectively; Dr. Donahue is professor emeritus of soil science at Michigan State University. They support the book's content with numerous references to academic and research literature as well as current working documents and manuals from governmental agencies. Most of the references were published after 1970.

More than 225 photographs, diagrams, and other illustrations help the reader understand the complex subject matter. The book's usefulness as a textbook is aided by the summary and questions at the end of each of the 20 chapters.

The chapters are well organized and arranged in logical sequence. Beginning with definitions of basic terms and a global history of conservation problems, the book goes on to discuss geology, soils, water and wind erosion, and conservation practices.

The authors do an excellent job of depicting global problems of soil erosion. Of special significance are their reviews of how soil erosion and other resource problems contributed to the downfall of many cultures and civilizations. Wisely avoiding the easy route of scare tactics, the authors make the case for conservation by objectively describing the causes and consequences of soil exhaustion in the ancient world. Parallels are drawn with present-day erosion and related resource problems in the developing countries.

Using descriptive examples, the authors explain the effects of wind and water erosion and how they can be minimized. Equations for predicting soil loss from wind and water erosion are described in a

concise, easy-to-read manner.

Chapters on the various types of conservation systems and practices were not written as specifications or standards, but they include critical data contained in accepted standards. The chapters on drainage, irrigation, and reclamation provide considerable information on the uses and benefits of methods for maintaining or restoring soil productivity.

In a chapter on the economics of conservation practices, Troeh, Hobbs, and Donahue discuss on-site economic benefits as well as regional and national perspectives. This information is sorely needed today. More and more people are asking hard questions about the economics of conservation.

The authors also summarize the activities and responsibilities of various federal, state, and local agencies and organizations concerned with soil and water resources. The modern conservation movement is reviewed, from its beginning with the first soil erosion research at the University of Missouri in 1917, through the formative period of the 1930s, to the present.

As in any book that attempts to be comprehensive, there are minor slip-ups and omissions. For example, it is difficult to agree with the authors that junk car bodies are suitable for stabilizing channel banks. Aside from the additional erosion they can cause, junk car bodies are unsightly and potential sources of water pollution. The many commercial matting materials suitable for bank protection are not mentioned.

The scope of the book could have been expanded by the inclusion of more information on the design and use of structural conservation measures. Also, more emphasis on water conservation or irrigation efficiency would have enhanced the chapter on irrigation. But these minor shortcomings do not detract from the book's overall usefulness and versatility.

As a textbook, handy reference, or general introduction, *Soil and Water Conservation for Productivity and Environmental Protection* contains current data and reflects the most recent knowledge in the conservation field. It is must reading for those desiring a reliable reference or a comprehensive, up-to-date account of the causes and effects of and solutions to soil and water conservation problems.—ARTHUR B. HOLLAND, *Northeast Technical Service Center, Soil Conservation Ser-*

vice, U.S. Department of Agriculture, Broomall, Pennsylvania 19008.

General

Extinction: The Causes and Consequences of the Disappearance of Species. By Paul and Anne Ehrlich. 305 pp., app., index, 1981. Random House, New York, N.Y. 10022. \$15.95.

Help for Environmental Programs. 1980. FS Program Aid No. 979. Forest Service, Washington, D.C. 20250.

World Food Problem and U.S. Politics and Policies: 1979-1980. Edited by Ross Talbot. 172 pp., 1981. Iowa State University Press, Ames, 50010. \$12.50, plus \$1.00 for postage and handling.

Weather Almanac: A Reference Guide to Weather, Climate, and Air Quality in the United States and Its Key Cities (third edition). Edited by James A. Ruffner and Frank E. Bair. 801 pp., maps, charts, tpls., gloss., index, 1981. Gale Research Co., Detroit, Mich. 48226. \$48.00.

Agricultural-Food Policy Review: Perspectives for the 1980s. 148 pp., illus., tpls., refs., 1981. Economics and Statistics Service, Washington, D.C. 20250.

Forests

The Nation's Unused Wood Offers Vast Potential Energy and Product Benefits. 115 pp., apps., gloss., 1981. EMD-81-6. U.S. General Accounting Office, Gaithersburg, Md. 20760.

Trees of Our National Forests. 32 pp., illus., 1980. FS Program Aid 1124. Forest Service, Washington, D.C. 20250.

State Trees and Arbor Days. 18 pp., illus., 1981. FS-352. Forest Service, Washington, D.C. 20250.

How to Compare Fuel Values. By Rodger A. Arola and John A. Sturos. 1980. North Central Forest Experiment Station, St. Paul, Minn. 55108.

Human Populations

Are Agencies Doing Enough or Too Much for Archeological Preservation? Guidance Needed. 102 pp., app., 1981. CED-81-61. U.S. General Accounting Office, Gaithersburg, Md. 20760.

Soils

Surficial Geology: Building with the Earth. By John E. Costa and Victor R. Baker. 498 pp., illus., tpls., app., index, 1981. John Wiley & Sons, Inc., Somer-

set, N.J. 08873. \$24.95.
Geologic Parent Materials of Montana Soils. By Roger Veseth and Clifford Montagne. 117 pp., illus., apps., 1980. Bull. 721. Montana State University, Bozeman, 59717. \$2.00.
Soils and Agriculture (volume 2). Edited by P. B. Tinker. 151 pp., illus., refs., index, 1981. John Wiley & Sons, Somerset, N.J. 08873. \$27.95.
Soil Erosion and Sedimentation Control. 181 pp., illus., apps., 1981. Environ-

mental Design Press, Reston, Va. 22090.
Soil Biochemistry (volume 5). Edited by E. A. Paul and J. N. Ladd. 504 pp., illus., 1981. Marcel Dekker, New York, N.Y. 10016. \$65.00.
Soil Conservation Problems and Prospects. 576 pp., illus., index, 1981. John Wiley & Sons, Somerset, N.J. 08873. \$61.95.

Water

Institutional Constraints on Alternative Water for Energy. A Guidebook for Re-

gional Assessments. 209 pp., apps., bibliog., 1980. National Technical Information Service, Springfield, Va. 22161. \$14.00.

Hydrologic Data for Experimental Agricultural Watersheds in the United States, 1971. 509 pp., tpls., 1980. U.S. Government Printing Office, Washington, D.C. 20402.

Georgia Water Resources: Issues and Options. Edited by James E. Kundell. 114 pp., illus., tpls., 1980. Institute of Government, University of Georgia, Athens, 30602. \$10.00.

Waterpower '79: Proceedings. 1981. U.S. Government Printing Office, Washington, D.C. 20402. \$11.00.

Water Supply in a Urbanizing Environment. 168 pp., illus., 1980. Cooperative Extension Service Bulletin Center, University of Massachusetts, Amherst, 01003. \$4.00.

Water Quality Management: Groundwater Protection. 36 pp., 1980. Environmental Protection Agency, Washington, D.C. 20460.

Water Resources Protection Technology. By J. Toby Tourbier and Richard Westmacott. 184 pp., illus., 1981. Urban Land Institute, Washington, D.C. 20005. \$15.00, ULI member; \$20.00 nonmember.

Groundwater Monitoring. By Dr. Lorne Everett. 529 pp., 1981. General Electric Co., Schenectady, N.Y. 12305. \$150.

Federal Water Resources Agencies Should Assess Less Costly Ways to Comply with Regulations. 85 pp., illus., apps., gloss., 1981. CED-81-36. U.S. General Accounting Office, Gaithersburg Md. 20760. Bound, \$3.25; unbound, \$1.00.

Federal-Interstate Compact Commissions: Useful Mechanisms for Planning and Managing River Basin Operations. 41 pp., apps., gloss., 1981. CED-81-34. U.S. General Accounting Office, Gaithersburg Md. 20760. Bound report, \$3.25; unbound, \$1.00.

International Symposium on Rainfall-Runoff Modeling Proceedings. 369 pp., 1981. Water Resources Research Institute, Mississippi State University, Mississippi State, 39762.

Fish and Wildlife

How to Attract Cavity-Nesting Birds to Your Woodlot. North Central Forest Experiment Station, St. Paul, Minn. 55108.

Agriculture

Livestock Waste: A Renewable Resource. Proceedings of the Fourth International Symposium on Livestock Wastes—1980. 430 pp., illus., 1981. American Society of Agricultural Engineers, St. Joseph, Mich. 49085.

Guide on Selective Equipment. 16 pp., illus., 1981. Monsanto Agricultural Products, Little Rock, Ark. 72231.