



Bulletin

of the International Society of Soil Science

Bulletin

de l'Association Internationale de la Science du Sol

Mitteilungsblatt

der Internationalen Bodenkundlichen Gesellschaft

Boletín

de la Sociedad Internacional de la Ciencia del Suelo

**INTERNATIONAL SOCIETY OF SOIL SCIENCE (ISSS)
ASSOCIATION INTERNATIONALE DE LA SCIENCE DU SOL (AISS)
INTERNATIONALE BODENKUNDLICHE GESELLSCHAFT (IBG)**

Founded/Fondée/Gegründet: 19-05-1924. Individual membership/Membres individuels/Individuelle.
Mitgliedschaft: 7000. Affiliated national and regional Societies/Associations nationales et régionales affiliées/
Angeschlossene nationale und regionale Gesellschaften: 65.
A scientific-associate member of ICSU since/Membre associé scientifique de l'ICSU depuis/Wissenschaftlich-
assoziiertes Mitglied der ICSU seit: 1972.

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II. Soil Chemistry/Chimie du Sol/Bodenchemie

Prof. Dr. R.S. Swift, University of Reading, London Road, Reading RG1 5AQ, United Kingdom

III. Soil Biology/Biologie du Sol/Bodenbiologie

Prof. Dr. J.M. Lynch, Horticulture Research International, Worthing Road, Littlehampton, West Sussex
BN17 6LP, United Kingdom

**IV. Soil Fertility and Plant Nutrition/Fertilité du Sol et Nutrition des Plantes/Bodenfruchtbarkeit und
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Prof. Dr. C.J. Asher, Dept. of Agriculture, University of Queensland, QLD 4072, Australia

**V. Soil Genesis, Classification and Cartography/Genèse, Classification et Cartographie du Sol/
Bodengenetik, Klassifikation und Kartographie**

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VI. Soil Technology/Technologie du Sol/Bodentechnologie

Prof. Dr. G.S. Sekhon, Dept. of Soils, Punjab Agric. Univ., Ludhiana 141 004 Punjab, India

VII. Soil Mineralogy/Minéralogie du Sol/Bodenmineralogie

Prof. Dr. R.J. Gilkes, University of W.A., Dept. of Soil Science, Nedlands, WA 6009, Australia



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CONTENTS - SOMMAIRE - INHALT

Editorial	5
Second Announcement of the XVth International Congress of Soil Science (ICSS) in Acapulco, Mexico, 1994	7
Announcements of ISSS-Meetings Annonces de réunions de l'AISS	13
Ankündigungen von IBG-Tagungen	
Registration Form for ISSS-Meetings Fiche d'Inscription pour des réunions de l'AISS	16
Anmeldeformular für IBG-Tagungen	
ISSS Membership Number and its Meaning Numero d'Affiliation de l'AISS et sa Signification	18
IBG- Mitgliedsnummer und ihre Bedeutung	
Addresses of the Officers and Chairmen of Commissions, Subcommissions, Working Groups and Standing Committees of ISSS	21
ISSS Committees and Representatives	25
Soil Science: Should we change our paradigm?	26
A rare occasion	28
Activities of the Commissions and Working Groups Activités des Commissions et Groupes de Travail	29
Aus der Tätigkeit von Kommissionen und Arbeitsgruppen	
Reports of Meetings Compte-rendus de Réunions	31
Tagungsberichte	
News from regional and national Societies Nouvelles des Associations régionales et nationales	42
Berichte der regionalen und nationalen Gesellschaften	
International Relations Relations internationales	48
Internationale Beziehungen	
Appointments, Honours Nominations, Distinctions	60
Ernennungen, Auszeichnungen	

In memoriam	63
Meetings, Conferences, Symposia Réunions, Conférences, Symposia	66
Tagungen, Konferenzen, Symposien	
International Training Courses Cours internationaux de Formation	74
Internationale Fortbildungskurse	
New Publications Nouvelles Publications	82
Neue Veröffentlichungen	
ISSS Cooperating Journals Journaux coopérants de l'AISS	144
IBG kooperierende Zeitschriften	
Subscription Form - Cooperating Journals Fiche d'Abonnement - Journaux Coopérants	145
.Bestellformular - Kooperierende Zeitschriften	
ISSS Membership Application Form AISS Fiche de Demande d'Affiliation	147
IBG Aufnahmeantragsformular	

EDITORIAL

This is the third Bulletin edited by the Secretary-General in Vienna/Austria, in close cooperation with his deputy in Wageningen, The Netherlands. We apologize for the late arrival of the last issue and will do our best to ensure that future issues will reach you in time.

In view of the fact that the ISSS comprises 65 national societies (still counting all states of the former USSR as one) and about 6500 individual members with a large number of activities in some 130 countries of the world, the level of feedback and information received for publication in the Bulletin is not yet entirely satisfactory. Therefore, I should like to ask members and particularly national society secretaries to make greater use of our semi-annual bulletin, for communications on scientific progress, e.g. in international workshops, seminars, conferences or other events which have taken place in your individual countries. National and regional affairs of soil science, including government policies for soil protection, elections of new officers of regional and national societies are other examples of interesting news which could be reported.

In his guest editorial in Bulletin No. 80, our President, Prof. Dr. A. Aguilar Santelises invited you to participate in the next International Congress of Soil Science in Acapulco/Mexico in 1994.

Since such an international congress should not only demonstrate newly acquired scientific knowledge, but also raise questions about the general status of soil science today and its future development, I should like to initiate further discussion on this topic by posing a few questions:

1. Are we aware that soil is used not only for biomass production (food, fodder and renewable energy), but also forms a most important protective medium in our environment, filtering, buffering and transforming adverse compounds, thus keeping the groundwater clean and the food chain free from contaminants?
2. Do we take into account that soil organisms form a gene reserve and a genetical heritage of highest importance, from which - maybe tomorrow or maybe in fifty years - we may need some genes for the sake of mankind, remembering Sir Alexander Fleming, who isolated the antibiotic penicillin from an ubiquitous soil fungus named penicillium in the nineteenth century?
3. Are we to focus our scientific activities on these soil functions where cooperation with other sciences is possible in order to show them what our contribution to their ecological or environmental targets could be?
4. Finally, where does soil science, as an environmental science, stand today? Is it accepted as a full partner within (natural) sciences, and if not, why not? - Could one reason be that we have not yet been able to reach an agreement about the fundamental questions of our own subject (for example the soil group/soil type) through a generally and unanimously accepted international soil classification system (besides national ones)?

The answers to some of these questions were recently discussed by the Past President of the Soil Science Society of America, Fred P. Miller, in the *Agronomy News* of October 1991 (pp 8 - 9) under the title "Soil Science: Should we Change our Paradigm?" (see reprint pp 26 - 27 in this Bulletin)

My answer to Fred P. Miller's question would be: Yes, we should, in order to guarantee the

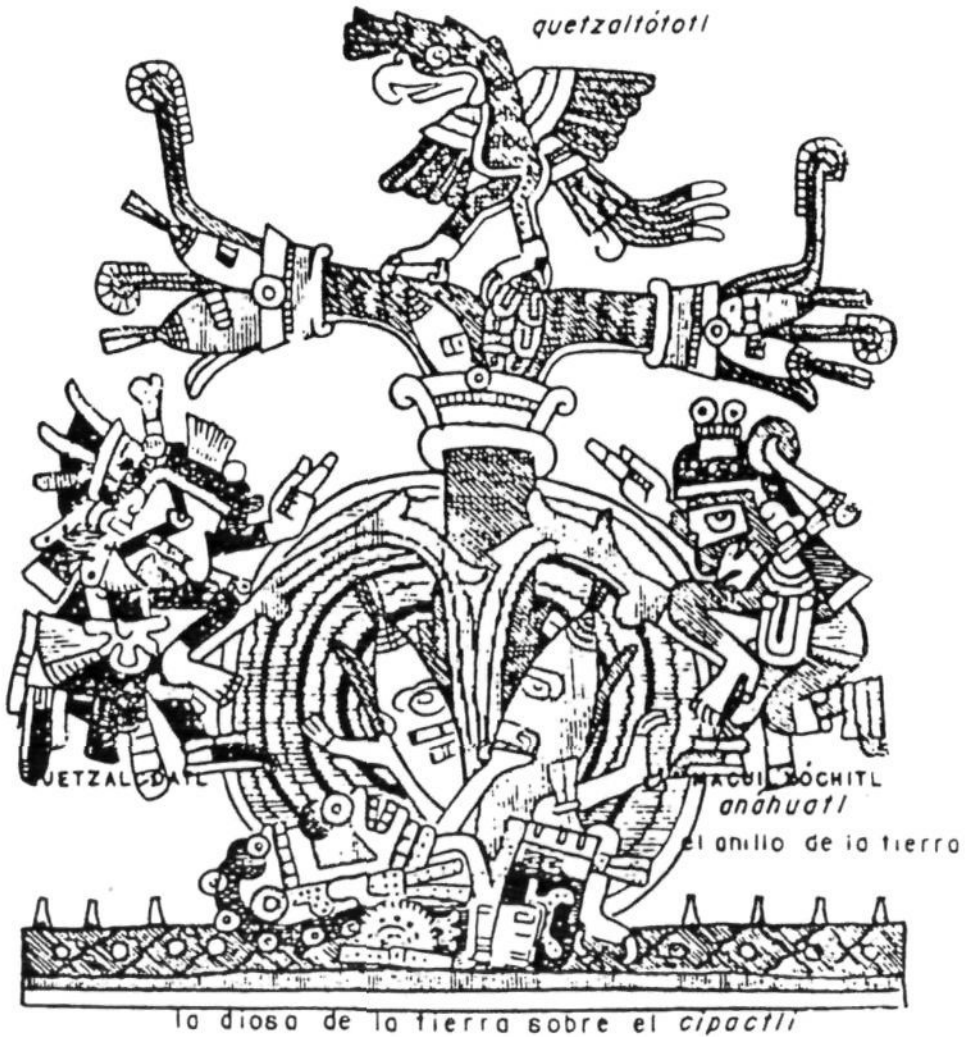
further development of soil science and to give our subject the reputation it deserves after a continuous progress within nearly a hundred years. We should evaluate proposed changes and, where appropriate, adapt them enthusiastically.

I should be pleased to receive your comments or remarks, enabling me to prepare a general discussion on this matter at our next International Congress in Acapulco, 1994.

Winfried E.H. Blum
Secretary-General, ISSS

XVth INTERNATIONAL CONGRESS OF SOIL SCIENCE
July 10-16, 1994
Acapulco, Guerrero, Mexico

SOIL UTILIZATION IN HARMONY WITH NATURE
Learning from the past to face the future



The Earth's GODDESS

The Earth's Goddess is nurtured by the blood of the gods in sacrifice, Macuilxóchitl, Lord of the flowers (to the right), and Quetzalcóatl, the Feathered Snake (to the left). The corn plant emerges from the center of the Earth's Goddess, leant on Cipactli, the crocodile, showing the male and female duality manifested by the red and yellow colors of its cobs. Quetzatltólotl, the rich feathered bird, poses on the top of the plant.

The Earth's Goddess destroys and builds, circled by dark aureoles which represent a lake.

(Original picture in colour)

Codex Borgia



ISSS-AISS-IBG

**SECOND ANNOUNCEMENT
XV INTERNATIONAL CONGRESS OF SOIL SCIENCE (ICSS)
JULY 10 - 16, 1994
ACAPULCO, GUERRERO, MEXICO**

**PRELIMINARY LIST OF SYMPOSIA TITLES
(July, 1992)**

As outlined in the first announcement (see Bulletin 91/2, No. 80), two types of symposia will be held during the XV ICSS:

- Disciplinary symposia, organized by Commissions and Sub-Commissions, in total 18, referring to most recent and relevant developments (state of the art) in the respective areas of soil science.
- Interdisciplinary symposia, organized by different Commissions, Sub-Commissions, Working Groups, Standing Committees or other institutions, without exact limitation for the time being.

In the following we present you a preliminary list of symposia titles, as worked out by the Organizing Committee, in close cooperation with the Chairmen of Commissions, Sub-Commissions, Working Groups and Standing Committees of ISSS as well as with other interested institutions.

Symposia marked with an asterisk (*) are symposia which in principle are approved by the Organizing Committee and the corresponding (Sub-)Commissions. All other titles correspond to symposia which are still undergoing preliminary arrangements and which are therefore not yet approved.

The definitive list of symposia titles will be published after approval by the Executive Committee of ISSS in November, 1992 in bulletin 92/2, No. 82, as well as in the "Invitation Programme", which will be mailed to all those who have sent their notice of intent, in January 1993.

If you have further suggestions or remarks, please send these to the Chairman of the Organizing Committee, Prof. Dr. R. Nuñez Escobar, Colegio de Postgraduados, 56230 Montecillo, Chapingo, México.



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I. Disciplinary Symposia

(Sub-)Commission	Title
I	* Infiltration in irrigated and dryland agriculture
I	* Solute transport in the soil
II	* Application of modern physico-chemical techniques in soil chemistry
II	Soil chemistry and the environment
III	* Rhizosphere microbiology and plant nutrition
III	* Function of microorganisms on agricultural sustainability
IV	* Soil productivity and nutrient cycling in relation to LISA
IV	* Effects of chemical and organic fertility on crop quality
V	* Characterization, assessment, and monitoring of stressed soil systems
V	* Utilization of soil's information in systems modelling for sustainable agriculture and global change studies
VI	* Sustainable agriculture: Present and future
VI	* Modern agrotechnology: Productivity, energetic efficiency and low environmental impact
VII	* Mineral reactions in the soil environment
VII	* Weathering and the formation of soil minerals
A	* Perspectives on soil salinity for the 21st century
B	* Micromorphological features as indicators of anthropological influence on soil
C	* Long term assessment of soil degradation and rehabilitation. Field methodology and modelling
D	* <i>Soil function modifications as a result of soil fauna alterations</i>



ISSS-AISS-IBG

2. Interdisciplinary Symposia

(Sub-)Commission or Institution	Title
II, IV	* Soil testing and plant analysis: Methodology and interpretation
III, IV	* Soil resilience and soil management
The Sulphur Inst.	* Sulphur in plant nutrition
UNAM, Cornell	* Soils and archaeological research
PPI	* Research for maximum yield in harmony with nature
ISSS-CEP	* Education in soil science
WG-LI	* An international framework for evaluating sustainable land management
Rockefeller Foundation	* The role of soil scientists in the design and development of soil conservation policies
FAO/IAEA	* Use of nuclear and related techniques in soil-plant studies for sustainable agriculture and environmental preservation
I, II, VII	* Organo-minerals associations and their effects on soil properties
ICRAF	Alternatives to prevent deforestation
I, IV, VI	Indurated volcanic soils: use and management Prehispanic Latin-American Agriculture (Soil management by past civilizations) Soils and biodiversity
WG-MV	Soil data needs for expressing land qualities at different scales
WG-HP	Origin and transmission of ideas in Soil Science
ISSS-CIP	Impact of soil on the carbon cycle: C-sequestration and release by oxidative and reductive biotransformation, abiotic (protolithic or photochemical) decomposition engineered carbon balance
V	Modelling soil genetic processes Soil acidity and liming in the tropics
ICRAF	Alternatives to slash and burn agriculture



ISSS-AISS-IBG

ANNOUNCEMENT

INTERNATIONAL SYMPOSIUM ON THE STRUCTURE OF THE SOIL COVER
Russia, September 6 - 11, 1993

General Information

An international symposium under the title "Structure of the Soil Cover" will be held in Moscow and Pushchino-Oka, Russia, on September 6 - 11, 1993. The Organizing Committee is pleased to invite all interested scientists to attend. The symposium will be organized by the V Commission of the Russian Society of Soil Scientists. Hosts will be the V.V. Dokuchaev Soil Institute of the Russian Academy of Agricultural Sciences in Moscow and the Institute of Soil Science and Photosynthesis of the Russian Academy of Sciences in Pushchino.

Rooms and board will be available in hotels of Moscow and Pushchino. There will be two field tours. English and Russian will be the official languages of the symposium. The registration fee is 300 US\$, including symposium materials, proceedings, sight-seeing and field-trip.

Scientific Programme

The scientific programme will include sessions of contributed papers to cover the following aspects:

1. Studies of the soil cover structure: theoretical principles and general problems
2. Evolution of the soil cover structure as affected by natural and anthropogenic factors.
3. Methods for studying and mapping the soil cover structure
4. The role of the soil cover structure in solving applied problems

Presentation of papers

Participants wishing to present a paper to any session of the symposium are asked to prepare a tentative title and send it together with the preliminary application form not later than the end of November 1992 to the joint Secretariat of the Organizing Committee.

Papers selected for reading will be published for distribution to participants on arrival, provided they are sent by February 1993. Papers may be up to 4 printed text pages in English or Russian (1.5 space typing)

Further information concerning the conference can be obtained returning the attached preliminary application form. All inquiries regarding the conference should be sent to:

Organizing Committee on SCS
V.V. Dokuchaev Soil Institute
Pygevsky per. 7.
109017 Moscow
RUSSIA

For registration, please use the "Notice of Intent/Registration Form" for ISSS meetings.



ISSS-AISS-IBG

ANNOUNCEMENT

**INTERNATIONAL WORKSHOP ON SOIL EROSION PROCESSES ON STEEP
LANDS.
EVALUATION & MODELLING
(Reunión Internacional sobre Procesos de Erosión en Tierras de Altas Pendientes.
Evaluación y Modelaje)
Mérida, VENEZUELA
May 16 - 20, 1993**

Despite the fact that soil erosion on steeplands is often the result of socio-economic factors, the selection of alternative methods of prevention and correction of soil erosion requires that the direct causes, as well as the physical processes involved, be identified and understood. Empirical models of erosion processes developed in a particular region often can not be extrapolated to zones with different characteristics, unless an adequate data base, collected over a sufficient period of time, is available. To avoid this problem, predictive models of erosion and related phenomena, based on the underlying physical processes, are being developed.

The purpose of the workshop is to bring together representatives of the various groups currently investigating erosion processes, as well as predictive models of these processes, in different parts of the world, in order to present and exchange ideas and experiences, and see the problems first-hand in the field.

To achieve these objectives, the workshop will include:

1. Presentations and discussions in working meetings of the latest experiences and advances in the diagnosis and prediction of the various processes of soil erosion in steep lands.
2. Visits and field evaluation of the various processes and problems of soil erosion in two regions of Venezuela with steep lands: The Andes mountains and Guayana.
3. Publication of the presentations and discussion in proceedings

Final date for abstracts (1 page): November 30, '92

Final date for papers (max. 12 pgs.): March 30, '93

Expected fees and costs:

Hotel accommodation in Mérida: US\$ 20 - 60 p/day

Registration (includes social events, three lunches, abstracts and proceedings):

Participants: US\$ 300; Accompanying: US\$ 50

Excursions (includes local transportation, lunches and lodging):

Mid-conference local tour: US\$ 50

Post-conference tour Andes: US\$ 100

Post-conference tour Guayana: US\$ 250

Information: Executive Secretary
CIDIAT-Parque "La isla", Aptdo. Postal 219
Merida, 5101 VENEZUELA
FAX: 58-74-441461

For registration, please use the "Notice of Intent/Registration Form" for ISSS meetings



ISSS-AISS-IBG

3rd ANNOUNCEMENT
2nd INTERNATIONAL SYMPOSIUM ON FOREST SOILS
"Forest Soil - Essential Component of Land Management"

November 22 - 27, 1992 (new dates) in Ciudad Guayana, Venezuela

The Working Group Forest-Soil Relationships, the Servicio Forestal Venezolano MARNR-SEFORVEN, the Sociedad Venezolana de la Ciencia del Suelo, the Universidad de Los Andes - Facultad de Ciencias Forestales, the Electrificación del Caroni, C.A., Servicio Autónomo para el Desarrollo Ambiental del Territorio Federal Amazonas, the Oficina de Relaciones Internacionales and the Programa Forestal de Oriente, C.A. organize the 2nd International Symposium on Forest Soils in Guri-Ciudad, Guayana, Venezuela.

The Program will include invited papers, voluntary papers and posters. It will be organized under the following headings:

1. Role of Forest Soils in Multiple Land Use.
2. Management of Soils under Agroforestry Systems.
3. Forest Soils and Watershed Management and Conservation.
4. Forest Soils and Natural Forest Management for Timber Production
5. Forest Soils and Plantation Forestry.
6. Forest Soils and Ameliorative Measures
7. Forest Soils: Geography, Genesis, Classification, Study Methods and Relationships between Soils and Forests.

Symposium languages will be English, Spanish and Portuguese.

Registration fee \$US 50.00.

Three options of technical tours to *Pinus caribaea* plantation in Orinoco Delta, Forest reserve of Imataca and San Carlos de Rio Negro in Amazonas Territory have been organized.

Please write to the following address for registration and further information:

2nd ISFS, Comité Organizador, Instituto de Silvicultura,
Facultad de Ciencias Forestales - Universidad de Los Andes,
Mérida 5101, Venezuela. FAX: 58-74-401503
or SADA-AMAZONAS Att. Dr. W. Franco, Apdo Postal 62781,
Chacao, Caracas 1062, Venezuela. FAX: 58-2-285-3070

(Prof/Dr/Ms/Mr/Mrs/Miss)

.....
First Name
Address
..... P/C
Organisation
Phone (W)(H).....
Fax
I intend to participate yes no
I intend to contribute with a poster yes no
with the title
Date..... Signature

**FIRST ANNOUNCEMENT
MEMORIAL SYMPOSIUM J. DE PLOEY
"EXPERIMENTAL GEOMORPHOLOGY AND LANDSCAPE ECOSYSTEM
CHANGES"**

In order to honour the memory of Prof. Jan De Ploey who passed away suddenly on March 30, 1992, a symposium will be organized by the Laboratory of Experimental Geomorphology at the Catholic University of Leuven. The symposium will take place in Leuven from March 22 - 27, 1993 and will be organized in cooperation with GERTEC (IGU-Commission on Geomorphological Response To Environmental Change) and the E.S.S.C. (European Society for Soil Conservation). It is the aim of the organizers to concentrate the discussions on those topics which Jan de Ploey dealt with in his research.

Particularly, the following themes are proposed:

- The use of experimental geomorphological methods (in a broad sense) to aid in the understanding of landscape ecosystems.
- Prediction of geomorphological response to environmental changes (climatic change, landuse change) on landscape ecosystems.
- The application of experimental geomorphological research to develop strategies to counteract negative effects of environmental change (soil and water conservation)

During the conference a one day excursion will be organized to various sites in central Belgium where members of the Laboratory for Experimental Geomorphology conduct research.

A selection of the presented papers will be published in a special volume of Catena.

Organizing Committee: R.B. Bryan (Canada), A.C. Imeson (The Netherlands), R.P.C. Morgan (United Kingdom), A. Yair (Israel), J. Poesen, G. Govers, D. Goossens, A. Pissart (Belgium).

Those wishing to receive the second circular should return the registration form *before September 30, 1992* to:

Memorial symposium J. De Ploey
Laboratory for Experimental Geomorphology
K.U. Leuven
Redingenstraat 16 B
3000 Leuven
BELGIUM

**REGISTRATION FORM
MEMORIAL SYMPOSIUM J. DE PLOEY
"EXPERIMENTAL GEOMORPHOLOGY AND LANDSCAPE ECOSYSTEM CHANGES"
Leuven, March 22 - 27, 1993**

Name: Title:

Institute/Organization:

Address:

Phone/Fax:

I intend to participate in the symposium yes no

I intend to submit a paper/poster yes no

Tentative title:

Approximate cost:

- registration fee (including field trip and banquet: 6000 BEF
- accommodation in hotel (double room) + meals: approx. 2500 BEF/day



Notice of Intent/Registration Form
Note d'Intérêt/Fiche d'Inscription
ISSS-AISS-IBG Absichtserklärung/Anmeldeformular

To: Organizing Committee of

.....
.....
.....

From: Name and title

.....

full address:

.....
.....

telephone:

fax:

Dear Madam, Sir,

0 I intend to participate in the conference, meeting, seminar, workshop* mentioned above.
Please send me detailed information.

0 I intend to present a paper/poster*, entitled:

.....

Comments:

0 I register for participation in the conference, meeting, seminar, workshop*, mentioned above.

Comments:

Date:

Signature:

* please delete if not applicable

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Example for an ISSS membership number (see e.g. the first line on your address-label):

1. eight-digit registration number (xxx-yyyy) consisting of:

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yyyyy = five-digit current number of the ISSS registration

2. supplementary code

for new members:

N 92 = new member 1992, contribution paid

NW92 = new member 1992, contribution not yet paid

for others:

92-L = the contribution for 1992 has been paid through the national society

92-I = the contribution for 1992 has been paid by the member directly to the ISSS.

Attention: This code informs always about your current payments, e.g. 90-L would mean that your last fee was paid through your national society in 1990.

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vosre numéro d'affiliation se trouve p.ex. sur vosre étiquette d'adresse en premier ligne (voire enveloppe du bulletin de l'AISS).

1. Numéro d'enregistrement de huit chiffres qui s'explique comme suit:

xxx = code du pays de trois chiffres qui indique en général le pays de résidence ou de l'association nationale, à laquelle le membre est affilié

yyyyy = code d'enregistrement interne de l'AISS de cinq chiffres

2. Codes supplémentaires

pour les nouveaux membres:

N 92 = nouveau membre en 1992, cõtisation annuelle payée

NW92 = nouveau membre en 1992, cõtisation annuelle encore à payer

pour les autres membres:

92-L = cõtisation annuelle de 1992 payé par l'association nationale

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1. achtstellige Registrier-Nummer (xxx-yyy) bestehend aus:

- xxx** = dreistelliger Ländernummer, bezeichnet in der Regel das Land, in dem das Mitglied wohnt oder dessen nationaler Gesellschaft es angehört.
- yyy** = laufender fünfstelliger Nummer unserer internen IBG-Registratur.

2. Zusatzkode

bei neuen Mitgliedern:

- N92** = neues Mitglied 1992, Beitrag 1992 bezahlt
NW92 = neues Mitglied 1992, Beitrag 1992 noch nicht bezahlt

sonst:

- 92-L** = Beitrag 1992 wurde über die nationale Gesellschaft bezahlt
92-I = Beitrag 1992 wurde vom Mitglied direkt an die IBG bezahlt.

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of

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SOIL SCIENCE: SHOULD WE CHANGE OUR PARADIGM? *

by

Fred P. Miller, Past President of SSSA

We often personify institutions through such characterizations as being "born", "reaching maturity", and perhaps "atrophying" or even "dying". Recent world events provide an example of how the news media used these personifying attributes to describe the current state of communism. How would we characterize the Soil Science Society of America? How would nonmembers, those we serve, and the scientific community characterize us?

Soil science was conceived by those early scientists educated and trained as chemists, physicists, biologists, and geologists, who applied their principles and tools to the study of soils. Much of our discipline's heritage and underpinnings are vested with the contributions of these scientists. However, through the simultaneous expansion of the agricultural experiment station programs, curriculum development in colleges of agriculture, and the development of the soil science and soil survey programs within USDA, a critical mass of soil scientists began to emerge during the 1920s and 30s. The American Society of Agronomy first recognized a soils section in 1932. Four years later (1936), this soils section merged with the American Soil Survey Association to become the Soil Science Society of America. Although conceived from the basic sciences, soil science was born of an agrarian marriage.

The discipline of soil science in America, therefore, has been nurtured and has matured under the aegis and institutions of agriculture. Likewise, SSSA has developed as a sibling of agronomy, one member of the Tri-Societies, ASA-CSSA-SSSA. This institutional arrangement has served us well. Space does not permit the chronicling of the numerous accomplishments, products, and developments of the SSSA under this agrarian paradigm.

But with maturity often comes stresses and growth pains (mid-life crises?) as new experiences are encountered and broader agendas are addressed. Should soil science and the SSSA restructure themselves as an independent discipline and society? Should a new paradigm be forged? As one would expect, the feelings of the SSSA membership represent all points along the spectrum of opinions on this question. These range from preserving the status quo to asserting ourselves as an independent discipline/society or redefining our paradigm by affiliating with the earth sciences.

There is much anecdotal evidence behind those who argue that soil science will not be accorded its rightful respect as an independent discipline while institutionalized under the agricultural paradigm. For example, to become a member of the Soil Science Society of America, one enrolls through the American Society of Agronomy. Our annual meeting is held under the auspices of ASA. Our annual printed program and abstracts are likewise published under an agronomic heading. Soil science monthly news is published in *Agronomy News*. Soil science is institutionalized under colleges of agriculture and the USDA. Publishers often catalog their soil science textbooks and other soil science references under agricultural headings. And federal funding agencies and the scientific community at large generally do not recognize soil science as a legitimate discipline apart from its agronomic ties.

Clearly, soil science has contributed greatly to agriculture and has a distinguished history associated with agriculture. Much of our journal is devoted to agriculturally focused research. But the scope of today's soil science is much broader than agriculture. More than half of the Society's nine divisions are titled generically with no reference to agriculture. Much of our research is focused on basic and applied nonagricultural uses. And many field soil scientists

practice in the private sector under titles that either coincidentally or purposely avoid any reference to agriculture.

Despite our broadened scope of interests and focus, soil science is still largely perceived as a stepchild of agronomy and practiced in virtual obscurity from the public and scientific community. Whether seeking research funds or market share in the private sector, soil science has a long way to go in establishing its independence and legitimacy as a science and profession outside the agricultural paradigm.

Should the Soil Science Society of America change its paradigm? The answer to that question should not be dictated by either the Society's officers or Board of Directors. We as a society are a democratic institution. The Society membership must answer this question. It will be answered either by design or by default. If by design, the Society's divisions must reflect on our mission, scope, and direction, and charge or goad the Society leadership and infrastructure to set a course of action, if different from the current course. If a formal and structured (designed) procedure is not followed to assess, and perhaps change, our paradigm, those who wish to change will vote by realigning their professional interest and financial resources through withdrawal from the Soil Science Society of America. They will form new organizations with other special interest groups (e.g. National Society of Consulting Soil Scientists, the Association for the Environmental Health of Soils, etc.), affiliate with other societies, publish elsewhere, and/or practice under banners of a different paradigm.

The SSSA is a strong and viable organization with a distinguished history. But there are signs of atrophy or paralysis among some of its parts. It may be simply a "personality" problem. We are not being invited to many of the global and national issues dances. Our absence is conspicuous among those formulating many of the agendas where soil science should play a role. Will cosmetic surgery or an advertising blitz be necessary for us to be invited to these functions? Or is more drastic surgery necessary to set us apart as an independent body? The latter has institutional as well as financial repercussions. Should we meet independently? Do we establish an independent headquarters operation? Should we affiliate with other earth science bodies or strive for independence? These and other questions are heady stuff, filled with the potential for both emotional trauma and institutional schism. And even if our paradigm is changed institutionally, our scientific creditability and professional legitimacy will not follow automatically. They must be cultivated on a personal level, with our fellow scientists and policymakers, as well as on the societal and institutional levels. No amount of PR and reorganization will substitute for solid science and professionalism focused on the core of what soil science is about.

I suspect that maturing with a changed paradigm and adjusting to its requirements will be far more challenging than anything our agrarian experience has confronted us with since our origins. There are over 6000 members of the SSSA who need to be heard from on this issue. If we choose not to consider a change, whether within or apart from ASA, then we should not lament our being inconspicuous as legitimate participants among the current agendas before humankind, ranging from agricultural sustenance to global change and environmental remediation. The question is not whether we can or should continue to play a major role in the agrarian component of soil science (clearly we must - there is much to accomplish!), but whether we should take our rightful place as a scientific discipline that can contribute to the other agendas of society where we currently have little or no recognition, voice, or legitimacy. To wait for invitations to play on these "other fields" without conditioning ourselves for an aggressive posture is tantamount to inviting the onset of scientific atrophy and professional rot along with the abdication of much of our domain to other disciplines.

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Activities of the Commissions and Working Groups
Activités des Commissions et Group de Travail
Aus der Tätigkeit von Kommissionen und Arbeitsgruppen

REPORT OF THE WORKING GROUP PALEOPEDOLOGY (PP)

**Paleopedology at and after the XIII INQUA Congress,
August 2 - 9, 1991, Beijing**

The subdivision and dating of terrestrial Quaternary sediments has undergone a major revolution in the last decade or so, thanks to the recognition of paleosols in the thick loess successions of China, Soviet Central Asia and parts of central and eastern Europe. The study of oxygen isotope ratios in deep ocean sediments had previously shown that sea surface temperatures oscillated from warm to cold as many as twenty times during the last two million years. The most recent of these cycles seemed to correspond in time with major climatic changes (glacial-interglacial cycles) deduced from palaeontological and sedimentological studies of terrestrial Quaternary deposits, but the idea of twenty or more glaciations in the last two million years seemed unthinkable for the classic areas of Quaternary glacial stratigraphy, such as the Alps, N. Germany or N. America.

It now seems that because of repeated glacial and periglacial erosion these classic areas preserve a very incomplete record of Quaternary climatic fluctuations, and to obtain a land-based equivalent of the much more complete oceanic record one must turn to areas such as northern China where loess (aeolian silt) was deposited during almost all the cold stages over the last 2.5 million years. The resulting loess accumulations are up to 300 metres or more thick, but can be subdivided and correlated from place to place by paleosols which formed mainly during the warmer (interglacial) stages.

In fact the paleosols seems to preserve the climatic record of the Quaternary in greater detail than do the deep oceanic sediments. In the Baoji section, a 160 m-thick sequence on the southern margin of the Chinese loess plateau which is now regarded as the paleopedological type section for China, there are no less than 37 clearly defined paleosols, each at least as strongly developed as the surface soil formed in the Holocene, and many others which are less strongly developed. These span the period since 2.5 million years ago, the time when loess was first deposited in northern China and other parts of Asia. As this is also the time when ice-rafted non-carbonate debris first appeared in oceanic sediment cores from the N. Atlantic, suggesting that the arctic glaciers were then rapidly increasing in size, it seems an appropriate worldwide datum for the beginning of the Quaternary, though this is by no means universally accepted among Quaternary geologists. The reason for commencement of loess deposition about this time in Asia seems to have been an episode of rapid uplift of the Tibetan plateau, which changed the atmospheric circulation pattern to produce a colder drier climate with more weakly expressed summer monsoons.

The paleosols within the loess sequence mainly represent warmer wetter periods with an intensified summer monsoon. In the Baoji section they are usually decalcified layers showing illuvial clay accumulation, blocky structure and variable enrichment in iron oxides; pollen analyses and mollusc studies indicate that they developed mainly under forest or mixed forest-grassland vegetation. The paleosols also show enhanced magnetic susceptibility, which allows the whole succession to be related to the now well-dated sequence of geomagnetic polarity reversals. On the basis of this time scale and other dating evidence, Fourier analysis of magnetic susceptibility measurements made every 10 cm through the 160 m-thick Baoji section has shown spectral peaks at periods of approximately 100 000, 40 000 and 20 000 years. These roughly correspond with the astronomical periodicities of changes in the eccentricity of the earth's orbit around the sun, the obliquity of the ecliptic and the longitude of perihelion, respectively, which influence the amount of solar radiation reaching the earth. Similar spectral peaks have been identified in the deep ocean sediments, and clearly determined the pattern of global climatic changes during the Quaternary, particularly the sequence of glacial/interglacial cycles.

In view of the geological importance which paleosols have assumed in loess stratigraphy, especially in China, it was hardly surprising that paleopedology featured very strongly in the scientific programme of the XIII International Congress of the International Union for

Quaternary Research (INQUA), held in Beijing August 2 - 9, 1991. It was an important component of the first plenary session on Global Environmental Changes and the Chinese Loess, organized by the outgoing president of INQUA (Nat Rutter from Canada) and the incoming President (Liu Tungsheng of China), and four of the 53 succeeding symposia were concerned almost entirely with paleosols. Rutter and Liu Tungsheng extended their plenary session into a one-day symposium on Paleoclimatic Interpretations of Soil-Loess Sequences; M. Pecs (Hungary), An Zhisheng (China) and J.A. Catt (UK) convened a two-day symposium entitled Scientific and Applied Aspects of Loesses and Paleosols, N. Federoff (France) and Guo Zhengtang (China) convened another one-day symposium on Possibilities of Paleopedology for Paleo-environmental Reconstruction; and L.R. Follmer (USA) organized a half-day symposium on Problems in Paleopedology Research. INQUA Commission 6 (Paleopedology), which is also Working Group PP of ISSS, sponsored the last of these and co-sponsored the second jointly with INQUA Commission 4 (Loess).

Because of its links with ISSS, INQUA Commission 6 now sees its main role within INQUA as clarifying fundamental aspects, such as the recognition of paleosols, their paleoenvironmental interpretation (climate, vegetation and topography) and stratigraphic significance (what periods of time they represent). The half-day symposium organized by L.R. Follmer (Commission 6 Secretary/Treasurer) only emphasized the difficulties in sorting out some of these basic problems; it developed into a heated discussion of how to define 'paleosol', how to distinguish them from other soils and how to differentiate grades of soil development. After this the other three symposia seem to flow very smoothly, enthusiasm for reconstruction of past global climatic changes perhaps blinding the participants to more fundamental questions, such as: What soil-forming processes affected the loess at the time it was being deposited on the land surface? How can the effects of this perecontemporaneous pedogenesis be distinguished from those of later processes under a different climatic regime? Which pedological processes account for the enhanced magnetic susceptibility of the paleosols? How have the older Quaternary soils been changed by diagenetic processes since burial? Despite our doubts over these pedological problems, it was pleasant to see paleopedology feature so strongly in the congress programme, and to realize that Quaternary geologists have recognized at long last the value of soil studies in reconstructing past global climatic changes.

One of the core research projects in the IGBP Global Change Programme is PAGES (Past Global Changes). This has a budget equivalent to about 10 % of the total IGBP budget, is funded jointly by Switzerland and USA and has an administrative office in Bern. PAGES has two objectives: (1) To reconstruct a detailed history of climatic and other environmental change since 2000 years B.P. with a resolution of 10 - 20 years, and (2) To reconstruct in less detail the changes that have occurred over the last interglacial/glacial cycle since about 125 000 years B.P. Both are intended to improve our understanding of natural processes that cause global climatic change, so that the different effects of natural and man-induced future change can be evaluated. Paleosols can provide much of the important evidence for the second PAGES objective, both in terms of reconstructing past climatic changes and in explaining fundamental processes of biosphere dynamics, such as carbon cycling, which influence the abundance of trace gases in the atmosphere.

In the next few years the INQUA Paleopedology Commission (ISSS Working Group PP) will encourage and coordinate the paleopedological input to the second PAGES objective, starting with a review of existing knowledge relating to changing soil development processes over the last 125 000 years. ISSS members who wish to be involved in this work, either in the review of existing information or in new work, especially any concerned with soils formed in loess, should contact the Chairman of Working Group PP (Prof. Dr. John A. Catt, Soil Science Department, Rothamsted Experimental Station, Harpenden, Herts. AL5 2JQ, UK), the Vice-Chairman (Prof Dr. Dan H. Yaalon, Institute of Earth Sciences, The Hebrew University, Jerusalem 91904, Israel) or the Secretary/Treasurer (Leon R. Follmer, Illinois State Geological Survey, Natural Resources Building, 615 East Peabody Drive, Champaign, IL 61820, USA).

J.A. Catt
Chairman WG-PP

Reports of Meetings
Compte - rendus de Réunions
Tagungsberichte

12th International Conference of the "International Soil Tillage Research Organization (ISTRO)" 8-12 July 1991 in Ibadan/Nigeria

The 12th International Conference of the "International Soil Tillage Research Organization" was held at the International Institute of Tropical Agriculture in Ibadan/Nigeria from 8-12 July 1991. The IITA is located on a 1.000 ha experimental farm about 5 km north of Ibadan, the second largest city in Africa. The institute, founded in 1967 is best suitable for the organization and realization of such a conference, at which about 130 participants from 40 different countries took part. About 95 lectures were given on the main theme of this conference "Tillage for sustainable crop production". Plenary sessions about "Tillage Systems in Different Eco Regions" on modelling and soil constraints as well as on socio-economic aspects gave an excellent overview and were intensively discussed.

Concurrent sessions were held on:

- soil related constraints with regard to crop production;
- soil chemical properties;
- soil physical and mechanical properties;
- soil compaction;
- soil machinery;
- farming systems;
- soil erosion;
- socio-economic aspects and modelling;
- modelling;
- tillage and sustainability.

Each plenary session was summed up by a report which will be published in the ISTRO News Letters. A mid-conference field tour revealed specific problems in farming systems with respect to soil erosion and sustainability of tillage systems. During a field visit to IITA longterm fallow management trials at the Westbank with the following main objectives were observed:

1. To compare promising food production and technologies for sustained and low chemical input crop production as compared to the bush fallow system;
2. To investigate the effect of fallowing in sustainance of production and to evaluate the cost effectiveness of the systems.

The whole conference was well organized and prepared under the chairmanship of Prof.Dr. R. Lal by the ITA, University of Ibadan/Nigeria and Ohio State University/USA. All of the participants were very thankful to the organizers for the opportunity of obtaining such profound information during the lectures and excursions in a very comfortable conference centre in Africa.

R. Horn, Kiel, Germany

**INTERNATIONAL SYMPOSIUM ON DYNAMICS OF ORGANIC MATTER IN
RELATION TO THE SUSTAINABILITY OF AGRICULTURAL SYSTEMS**

Leuven, Belgium, 4 - 6 November 1991

As part of the widespread interest in biological processes in tropical soil ecosystems, a cooperative project was initiated in 1987 between IITA, Ibadan, and K.U. Leuven through a grant of the Belgian General Administration for Cooperation and Development. The research findings of the first phase were presented and discussed during the symposium, which was attended by about 80 participants. The second objective of the workshop was to synthesise existing knowledge on nutrient cycling in tropical farming systems so as to focus research priorities towards management options ensuring agricultural sustainability. In this context, a plea was made for a type of "sustainable agriculture" that is not only ecologically and economically sound but also equitable.

Following a word of welcome, the history and achievements of the IITA-KUL project were presented. The main themes of the subsequent sessions were: 1) sustainability of agricultural systems, 2) characterization and quantification of organic matter, 3) nutrient cycling processes regulating the transfer of organic matter, 4) modelling transformations of organic matter, 5) organic inputs and soil organic matter, and 6) soil productivity. The conference also included an extensive poster presentation session (21) and two software presentations (CENTURY and SCUAF). The proceedings of the symposium will be published in early 1992.

Funding for the second phase of the IITA-KUL cooperation, in which the emphasis will be on "process-based studies of soil organic matter dynamics in relation to the sustainability of agricultural systems in the tropics", has been secured.

The scientific content of the symposium, hospitality of the organizers, "Nouvelle cuisine", and beauty of Leuven will definitely be remembered by all the participants.

N.H. Batjes, Wageningen, the Netherlands

**INTERNATIONAL SYMPOSIUM ON THE
"IMPORTANCE OF MICROMORPHOLOGY IN APPLIED SOIL SCIENCE"
10 - 11 Dec. 1991, Braunschweig, Germany**

The symposium was organized by the Institute of Plant Nutrition and Soil Science of the Federal Agricultural Research Centre (FAL) in Braunschweig-Völkenrode and held under the auspices of the *German Soil Science Society (DBG)* and the *Subcommission B (Soil Micromorphology)* of the ISSS on occasion of Prof. Dr. Altemüller's retirement. 65 participants from 10 countries were attending the meeting.

In his introduction the president of the DBG, Prof. Kuntze, outlined the role of micromorphology for a better soil utilization and conservation. In the following 3 half-day sessions 16 invited speakers from 6 European countries demonstrated different approaches with modern techniques used in soil micromorphology. Furthermore ideas were discussed and examples were given how these techniques can help to resolve the problems which an applied soil science is actually concerned with. The main topics of the session were:



Participants of the Symposium - Prof. Altemüller second from right in the first row

- The Mineral and Clay Complex as a Natural Resource
- Organic Matter, Humification and Soil Biology
- Soil Cultivation and Mechanization
- Soils and Environment

After the oral session Prof. Altemüller and his group held a workshop on improvements of thin section preparation and techniques of microscopy examination including fluorescent staining.

The presentations will be published in English language in a special issue of the FAL scientific journal "Landbauforschung Völkenrode" at approximately mid of 1992. These proceedings can be obtained for 15 DM from the Institute for Plant Nutrition and Soil Science, FAL, Bundesallee 50, 3300 Braunschweig, Germany.

M. Kücke, Braunschweig, Germany

INTERNATIONAL SYMPOSIUM ON NUTRIENT MANAGEMENT FOR SUSTAINED PRODUCTIVITY

February 10 - 12, 1992

Punjab Agricultural University, Ludhiana (India),

An international symposium on "Nutrient Management for Sustained Productivity" was held February 10 - 12, 1992 at Punjab Agricultural University, Ludhiana. The symposium was sponsored by Punjab Agricultural University, Indian Council of Agricultural Research and Indian Society of Soil Science. The co-sponsors were: Potash and Phosphate Institute of Canada - India Programme, and United Nations Development Programme/Food and Agriculture Organization. More than 200 soil scientists participated, of which 35 were from following

foreign countries: Australia, Bangladesh, Brazil, Canada, Iran, New Zealand, Peoples' Republic of China, Sri Lanka, Switzerland, U.K. and U.S.A.



. Inauguration of the symposium

Dr. K.S. Gill, Vice-Chancellor, Punjab Agricultural University, Ludhiana presided at the inaugural function where Mr. A.S. Pooni, State Development Commissioner was the Chief Guest. Those who spoke on the occasion included Dr. J.S. Kanwar, a Past President of International Society of Soil Science, Dr. D.R. Bhumbla, a Past Vice-President of ISSS, Dr. I.P. Abrol, President, Indian Society of Soil Science, Dr. G.S. Sekhon, Chairman, Commission VI, ISSS, Dr. R.L. Fox, Key Consultant, UNDP Project, Dr. A.S. Khera, University Director of Research and Dr. M.S. Bajwa, Head Department of Soils of the host institution. Dr. N.S. Randhawa, a former Director General, Indian Council of Agricultural Research delivered the keynote address.

Twenty-eight lead papers and over 100 poster papers were presented. Foreign authors of the lead papers included:

Dr. R.L. Fox (USA); Dr. R.E. White (New Zealand), Dr. G.Y. Tsuji (ICRISAT); Dr. T.M. Addiscott (U.K.), Dr. P.K. Khanna (Australia); Dr. J.R. Freney (Australia); Dr. B.V. Rajj (Brazil); Dr. B.A. Stewart (U.S.A.); Dr. J.J. Oertli (Switzerland); Dr. P.H. Williams (New Zealand); Dr. J.M. Duxbury (U.S.A.), Dr. R.N. Singh (U.S.A.) and Dr. S.S. Malhi (Canada).

The discussions at the symposium pointed out the need for periodic monitoring of soil and plant health problems; conservation and recycling of crop residues; inclusion of legumes and green manure crops in cropping systems; precision monitoring of nutrient behaviour in soils and appropriate interventions to minimize their losses; use of simulation and mechanistic models and systems analyses to study nutrient uptake and losses; use of modern tools for precision *analysis and scientific procedures to prepare best nutrient balance sheets; need to train young and middle level scientists for these studies and to strengthen the curricula by introducing appropriate courses on modelling and systems analyses; basic research on adsorption/desorption and release kinetics of the nutrients in the soil; distribution of nutrients in the rhizosphere; study*



View of the audience

of processes of nutrient immobilization/release, nutrient uptake and movement under various soil and water stresses; close interaction between professionals in the areas of nutrient management and plant genetics to facilitate cost effective and efficient nutrient management; preparation of resource inventory of soils with greater emphasis on mineralogical aspects; close national and international collaboration for the development of efficient fertilizer materials; intensive studies on soil-plant-animal-human interrelations and upgradation of professional skills of extension specialists for the improvement of decision support systems basic to nutrient management and nutrient related soil health problems.

The post symposium tour included visits to the laboratory and field experiments of the Department of Soils.

G.S. Sekhon
Chairman of Commission VI

INTERNATIONAL SYMPOSIUM FOR NUTRIENT MANAGEMENT FOR SUSTAINED PRODUCTIVITY

February 10 - 12, 1992,

Punjab Agricultural University, Ludhiana, India

The tendency to build research and development programs around catchwords and phrases is attended by some danger; one such danger being that the "tail begins to wag the dog" to such an extent that the "dog" may become unbalanced or even steered in a wrong direction.

Another danger is that adding a catch word to the title of a research proposal, which might otherwise have little merit, may convert it into priority research. Such "grantsmanship" is widely practiced. Unfortunately, it seems some officials do not recognize that scientists can be so devious. Matters may be made worse if catch words are combined into phrases which reduces

to nice-sounding acronyms such as LISA. LISA stands for Low Inputs Sustainable Agriculture. Can anyone suppose that LISA is anything but lively, desirable, etc.? And yet if ever there was a contradiction of terms, LISA is a prime example. One can scarcely imagine a low inputs system that will sustain agriculture in a meaningful way.

So, it is good that an International Symposium on Nutrient Management for Sustainable Agriculture was held Feb. 10 - 12, 1992, at Punjab Agricultural University, Ludhiana, India.

The Punjab region (the name can be translated, Five Rivers) is an outstanding example of what can be achieved with mediocre soils when high inputs are brought together in well-managed crop/soil systems. Production has increased and yields sustained for 30 years at a level and scale that might well be the envy of any area, anywhere, of similar size and soil resources.

The symposium, which was arranged by the Department of Soils, provided participants with a well-rounded exposure to the part soil and agronomic research and extension activities have played in developments in Punjab and the work that should be done to keep agriculture sustainable from the standpoint of production and environmental concerns. Lead papers were contributed by 40 authors from outside India, 16 from Indian institutions other than Punjab Agricultural University and 8 from PAU-soils. Poster presentations were 95 in number, representing 14 countries, arranged under the following headings:

	NUMBER OF POSTERS
Nutrient Dynamics in Soil-Plant Systems	17
Monitoring Soil Health	16
Fertilizer Nutrient Management	32
Integrated Nutrient Management	18
Systems Approach in Nutrient Management	2
Soil-Plant-Animal/Human Health Interactions	1
Nutrient Management Under Unfavorable Environments	9

Perhaps more time should have been allotted for discussions of the posters because, for many participants, this occasion was a unique opportunity to discuss ideas in an international forum.

Proceedings of the symposium in two volumes were available at the opening session. Volume 1 contains the lead papers and Volume 2, extended abstracts of the poster sessions. This was a successful symposium. Dr. M.S. Bajwa, Head, Dept. of Soils, Dr. N.S. Pasricha, organizing secretary, and supporting staff deserve thanks for a job well done.

R.L. Fox
University of Hawaii,
Honolulu, USA

INTERNATIONAL SYMPOSIUM ON STRATEGIES FOR UTILIZING SALT-AFFECTED LANDS

February 17 - 25, 1992, Bangkok, Thailand

Approximately 200 attendees from 19 countries, including 130 native and foreign residents in Thailand, participated in this symposium. The programme consisted of four days of technical sessions, a one-day mid-symposium field trip to observe coastal saline soils involving 80 participants and a four day post-symposium tour of inland saline soils and land use in Northeast Thailand with 57 participants.

H.R.H. Princess Maha Chakri Sirindhorn presided over the opening ceremonies and took a personal interest in the 17 poster papers and their contributors. Other high ranking officials

participating included Dr. Yookti Sarikaphuti, Permanent Secretary of the Ministry of Agriculture and Cooperatives, Dr. Santhad Rojanasoonthon, Governor of the Thailand Institute of Science and Technology Research and Mr. Sitilarp Vasuvat, Director General of the Land Development Department.



H. R. H. Princess Maha Chakri Sirindhorn opening the conference

Professor I. Szabolcs of Hungary and Dr. Somsri Arunin of Thailand respectively presented keynote lectures on "Overview of Salt-Affected Lands in the World" and "Strategies for Utilizing Salt-Affected Lands in Thailand". Forty eight papers were presented in the Technical Sessions addressing: (a) Genesis, Characteristics and Mapping Techniques; (b) Use of Saline Water for Irrigation; (c) Management of Salt-Affected Lands; (d) Ecology and Environment; (e) Salt Tolerance of Crops and Management, and (f) Halophytes.

The proceedings of this symposium, which is under preparation, will be of utmost interest to those involved in the use of saline and sodic soils.

During the symposium, ISSS Subcommission A, Salt-Affected Soils, held business meetings presided over by Chairperson Professor Zhao Qi-Guo, China. Recommendation of future activities of ISSS have been set up.

In the closing ceremony, Dr. M. Rédly, first vice chairperson, congratulated the 18 sponsors of the symposium that included both Thai and foreign agencies and societies, and the four principle organizers, the Department of Land Development of the Ministry of Agriculture and Cooperatives, Agricultural Science Society of Thailand, the Society of Soil and Fertilizer, and ISSS Subcommission A. Special appreciation were acknowledged for the success of the symposium and field trips to Dr. Somsri Arunin, Land Development Department, Secretary of the Organizing Committee, Dr. Pisoot Vijarnsorn and Mr. Pichai Wichaidt, field trip coordinators, Dr. Irb Kheoruenromne, Kasetsart University in Bangkok, the Program Coordinator and their most able assistants. A commemoration was paid to the late Professor Dr. Victor Abramovich Kovda, the 1968 - 1974 President of ISSS who strongly supported the activities of Subcommission A.



Participants of the International Symposium

The following summary and recommendations were accepted: (a) Papers covering salinization and alkalization were academically stimulating and generated substantial discussion under a most friendly atmosphere; (b) Of particular interest were the progress made on the use of salt-affected lands in Thailand; (c) Recommended international cooperation to assess more accurately and economically existing and potential global salinity, and (d) An Ad Hoc Committee (consisting of Dr. J. Rhoades, Director of the US Salinity Laboratory, Professor K. Tanji, University of California, Davis and Dr. J. Oster, University of California, Riverside) was appointed to plan the next Subcommittee A Symposium to be held in California in 1994 which will be followed by a Symposium sometime in the future in Valencia, Spain (to plan it Professor J. Battle-Sales was appointed).

Professor Zhao, chairperson of Subcommittee A, expressed his sincere appreciation to the Organizing Committee for creating a hospitable setting in which participants learned a lot from Thai and other visiting scientists. He pointed out that the symposium proceedings will a substantial knowledge base on the use of salt-affected soils. Professor Zhao stressed that salinization is both a global problem as well as a local problem for food production and international trade.

Professor Dr. S. Vacharotayen, President of the Society of Soil and Fertilizer, Thailand, presided over the award ceremony where two posters were awarded. Finally, the lead speakers for each of the technical sessions were presented a token of appreciation.

During the Post Conference Tour (22 - 25 February), soil profiles, ground water study projects, salt tolerant tree, halophyte and agricultural experiments, salt making process, private farming, reforestation project, mangrove experiments were demonstrated. The high level scientific programme was completed by rich and colorful cultural and sight-seeing programmes.

The objectives of the Organizing Committee to bring together international and interdisciplinary scientists specializing in the use of salt-affected lands, provide a forum to exchange research knowledge and experiences, and promote technology transfer between disciplines and countries have been admirably met by this symposium.

K.K. Tanji
University of California
Davis, USA

**International Conference on Agricultural Management in Salt
Affected Areas
Agadir, Morocco, April 26 - May 3, 1991**

The Institut Agronomique et Veterinaire Hassan II, in collaboration with the Islamic, Educational Scientific and Cultural Organization (ISESCO) and cooperating with numerous national and international bodies organized the conference devoted to recent problems of study, improvement and agricultural management of salt affected areas.

The venue of the Conference was the Agadir Beach Club Hotel, offering excellent facilities for the meeting which was attended by more than 250 participants, representing more than 25 countries, national and international organizations.

On April 27 the Conference was inaugurated by Prof. Abdelhadi Boutaleb, Director General of the Islamic Educational, Scientific and Cultural Organization (ISESCO) and by the Minister of Agriculture as well as by the Director of Hassan II Institute for Agronomy and Veterinary Sciences. All the speakers emphasized the actuality and importance of soil and water salinity and their significance to agronomical and environmental issues.

The professional part of the Conference consisted of sessions and workshops, as follows:

Session I. Plenary lecturers:

Dr. I. Szaboles, Hungary: Desertification and Salinisation

Dr. D.W. Rains, U.S.A.: Salinity and Alkalinity as Issue in World Agriculture

Session II. Mechanism of salt tolerance (8 papers)

Session III. Breeding and screening for salt tolerance (13 papers)

Session IV. Crop, soil, and water management under saline conditions (12 papers)

Session V. Halophytes utilisation in agriculture (7 papers)

Workshop I. Role of biotechnology in breeding for salt tolerance.

Workshop II. Comparative advantages of domestication of halophytes and breeding of glycophytes.

Workshop III. Interactions of drainage/engineering of biological tolerance

Workshop IV. Salinity problems in the Maghreb.

The meetings of the four Workshop groups took place at the premises of Agadir Branch of the Institut Agronomique et Veterinaire Hassan II.

Concurrently with sessions, a poster exhibition was also available for the participants with more than 15 posters, related to the subject of the Conference.

The presentations and the discussions came to the conclusion that the study, methodology of investigation and improvement of salt affected areas, as well as the prediction and prevention of those adverse processes should be intensified and coordinated. National, regional and international activity is necessary in order to combat salinization and alkalinization. Recommendations were accepted in respect of mapping, reclaiming of salt affected areas, particularly in Arabic countries, but also on an international level.

The Sessions of the Conference were followed by a two-day excursion to the south of the country for Ouarzazate and Zagora, visiting a halophyte nursery and halophyte ranges in the district of the Sahara.

Apart from the new scientific achievements and practical recommendations presented at the Conference, the participants agreed on the necessity of further cooperation of research workers, decision-makers and managers in the field of salinity which is extending parallel with the increasing of irrigation and which poses a serious hazard for the forthcoming period. Beside the scientific value of the meeting the beauty of the country, as well as the hospitality of the organizers made the Conference an unforgettable event for all the participants.

I. Szaboles, Budapest, Hungary

EVOLUTION OF SOILS DISCUSSED AT PUSHCHINO (May 4 - 8, 1992)

The Institute of Soil Science and Photosynthesis of the Russian Academy of Sciences in Pushchino, Moscow Region, was host from May 4th to 8th, 1992, to a Conference on "EVOLUTION OF SOILS AND SOIL COVER IN CONNECTION WITH THE TRANSFORMATION OF THE ENVIRONMENT". Apparently this was the third of this kind of conferences on soil evolution (1st in 1984, 2nd in 1989). Evolution, rather than genesis, is the preferred Russian term for soil development and transformation. This time the name was broadened to call the conference International, partly to accommodate visitors from other states of the previous Soviet Union (Ukraine, Belarus, Moldova) and also to attract overseas visitors. The proceedings were entirely in Russian.

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Russian soil scientists continue to pay great attention to soil genesis in all its aspects, past and present, detailed and generalized, more or less in continuation of the well established genetic school of Russian pedology. The analysis and mapping of Holocene paleosols on the Russian plain, in part using archaeology for dating the sequences, in addition to C-14 dating of soil organic matter, is a major field of study. Cryopedology is highly advanced. Theoretical models of soil evolution were discussed by several of the senior scientists; discussions were frequently keen and lively. Though several of the presentations sounded like a replay of previous performances and were often poorly presented or illustrated, the many interesting papers on Holocene soils, in particular by Dr. I.V. Ivanov and his collaborators from the laboratory of Soil Genesis and Evolution at Pushchino, compensated for this. Using soils buried beneath archaeologically dated burial mounds (tumulus or barrow) as their main object of study, I.V. Ivanov was able to reconstruct in detail the changes taking place in soil organic matter content, soluble salts and carbonate distribution in various steppe soils during the Holocene and thus infer climatic fluctuations and rates of change.

The interest in all these topics is admirable, and probably only in Russia can such a conference take place and attract so many soil scientists. Originally nearly 200 persons announced their interest to attend and submitted titles or abstracts. Eventually some 70 attended. Others were unable to come due to the considerably higher travel costs in comparison to previous years. In all, some 35 papers were discussed orally and some 30 presented as posters, all in Russian only. As the only non-Russian speaking overseas visitor I was favored by continuous attention from English speaking colleagues, who privately translated to me every lecture. My own presentation on catenary evolutions in aridic soils was translated sentence by sentence.

One day before this conference, the Pushchino Institute of Soil Science and Photosynthesis, now headed by Prof. V.S. Kefeli, held a memorial lecture honoring one of its founders, Prof. V.A. Kovda, who died in October, 1991. To become an annual feature, the lecture was this time given by Academician V.S. Shovelukha from Moscow, on Adaptation of plants to stresses, and by Prof. D.H. Yaalon from Jerusalem on The relevance of soils to other sciences.

The soil science section of the Pushchino Institute comprises several major laboratories dealing with agrochemistry, soil geochemistry and mineralogy, cryopedology, soil genesis and cartography, and employs some 200 scientists and technicians. The pleasant and idyllic environment of Pushchino, some 100 km south of the bustling metropolis of Moscow, and the obvious eagerness of our Russian colleagues to establish and improve relations with their overseas colleagues made this a memorable experience.

D.H. Yaalon, Jerusalem, Israel

New from Regional and National Societies
Nouvelles des Associations régionales et nationales
Berichte der regionalen und nationalen Gesellschaften

The First ESAFS Workshop: Correlation of the National Soil
Classification Systems for Agro-technology Transfer
November 10 - 15, 1991, Osaka, Japan

East and Southeast Asia Federation of Soil Science Societies (ESAFS) was established at the 14th International Congress of Soil Science held at Kyoto in 1990, aiming at the promotion of researches in soil and related sciences as well as the dissemination of the acquired knowledge and technology for the benefit of the member societies in the region of East and Southeast Asia. The office of the federation shall be moved from one member society to another every two years and is currently held by the Japanese Society of Soil Science and Plant Nutrition (JSSSPN) for the period of 1990 - 1992. Activities of the federation include the publication of newsletters and the organization of symposia and workshops.



Participants of the 1st ESAFS workshop

The first ESAFS workshop sponsored by ESAFS and JSSSPN was held at Osaka, Japan, in November 10 - 15, 1991. SMSS also contributed sufficient copies of Keys to Soil Taxonomy to be distributed to all participants to the workshop. The aim of the workshop was to exchange the idea of national soil classification systems and correlate them so as to provide a consistent basis for agro-technology transfer among the member countries. The workshop consisted of a 3-day field tour and 2-day symposia and was attended by more than 45 participants from 9 countries including Korea, China (mainland), China (Taiwan), Thailand, Malaysia, Philippines, India, U.S.A., and Japan.

The field tour covered the southwestern part of Japan and included 3 upland soils (Ultisols) with prominent tiger-stripe mottles of iron segregation, so called Tora-han, formed on relatively old surfaces (Pleistocene), 3 paddy soils (Entisols) in polders showing a chronological sequence after reclamation, and 2 paddy soils (Entisols/Inceptisols) derived from alluvium with a long history of irrigation. These pedons were classified according to the national classification systems whatever available in the member countries as well as Soil Taxonomy for international communication. Discussions during the tour were concentrated on the Tora-han mottles vs. a plinthite, horizons with alteration due to rice cultivation on alluvial materials vs. a cambic horizon, and differentiation of endo-, epi, anthraquic soil moisture regimes.

In the symposia were presented 12 papers on the national soil classification systems currently used in the member countries, new proposals of classification system and soil taxa, and characterization and interpretation of the soils encountered in specific regions. An additional session was held to examine how the 8 pedons in the tour could be correlated to each other within the various systems of soil classification. At the end of the workshop, a general discussion and conclusion session was chaired by Dr. Kyuma, the President of ESAFS, and the following items were discussed and recommended

- 1) The need for further effort to correlate national soil classification systems for agro-technology transfer.



During the field tour

- (2) The need to expedite the exchange of the information on the methods in soil description and analysis within the ESAFS region towards standardization.
- (3) The need for a more active contribution to the improvement of Soil Taxonomy, especially in defining the type and degree of wetness (aquic soil moisture regime) and some diagnostic horizons due to rice cultivation with irrigation.
- (4) A proposal for a more positive contribution to the global environmental issues through monitoring various soil characteristics by formulating a regional network.
- (5) A proposal for the dissemination of scientific knowledge to the public through translating technical terms into peoples' language.

The proceedings and the tour guide for this workshop (US\$ 40) can be obtained from T. Kosaki, Lab. of Soils, Kyoto University, Kyoto 606, Japan

T. Kosaki, Kyoto, Japan

SOIL SCIENCE SOCIETY OF EAST AFRICA (SSSEA)

From 2nd to 6th December, 1991, the **11th Annual General Meeting of the Soil Science Society of East Africa** was held in Kampala, Uganda.

The theme of the meeting was "Soil Science in Sustainable Land Productivity and Environmental Protection - a Key to National Development"

Fourty papers were presented and included issues on environmental degradation, soil survey and land evaluation, soil chemistry, soil fertility and management. The role of woman in environmental issues was also a topic of significance, with a good number of women speakers.

The full-day excursion to the south of Kampala highlighted problems of land degradation resulting from urban refuse and from changes in land use due to economic and social pressures.

At the end of the meeting a number of recommendations were made to international organizations, governments, institutions and individual scientists.

The following office bearers were elected for the year 1991 - 1992:

Chairman	:	Mr. Benjamin Gama, Mwanza, Tanzania
Secretary General	:	Mr. Juvent P. Magoggo, Tanga, Tanzania
Treasurer General	:	Mrs. Joy K. Tumuhairwe, Kampala Uganda
Vice Chairman (Uganda)	:	Prof. Julius Y.K. Zake, Kampala, Uganda
Vice Chairman (Kenya)	:	Dr. Benson Mochoge, Nairobi, Kenya
Treasurer Kenya	:	Mr. C.M. Njihia, Marigat, Kenya
Treasurer Tanzania	:	Mrs. Susan T. Ikerra, Tanga, Tanzania
Committee members		
	Uganda:	Ms. J.M. Tukahirwa Mr. John B.K. Kavuma
	Kenya:	Mr. George O. Ayaga Mr. E.R.N. Tong'i
	Tanzania:	Mr. Jeremias G. Mowo Dr. P.N.S. Mkeni

The next meeting is planned to be held in Kenya in December, 1992. Current membership stands at about 210.

Fourth National Congress of the HELLENIC SOCIETY OF SOIL SCIENCE

The Fourth Panhellenic Congress of Soil Science was organized by the Hellenic Society of Soil Science from May 6 to 9, 1992 under the general title "Soil-Environment" in Edessa, Central Macedonia.

Sixty five papers were presented by 105 scientists, members and non-members of the Society, covering a wide range of topics which included the following areas: Soil fertility and plant nutrition, Soils-plant growth and environment, Soils of forest ecosystems, Soil water relationships, Soil chemistry, Remote sensing and computerization of soil management.

About 300 scientists from all over the country participated in this important scientific event. Useful conclusions were drawn, contributing to the better understanding of these areas. The need for optimization of the use of soil resources was emphasized by all participants.

Within the context of the programme, elections were held on May 8, 1992, for the officers of the new term 1992 - 1994;

President	:	Dr. A.D. Simonis, Director Soil Science Institute, Thessaloniki
Vice President	:	Dr. S. Alexandris, Gen. Director, Ministry of Agriculture, Athens
Secretary General	:	Mr. P. Koukoulakis, M.Sc., Dept. Director, Soil Science Institute, Thessaloniki
Treasurer	:	Dr. N. Sidiras, Prof. Educational Technological Institute, Larisa
Members	:	Dr. Ch. Tsandilas, Agricultural Bank of Greece, Larisa Dr. K. Panayiotopoulos, Assoc. Prof. Arist. University, Thessaloniki Dr. D. Pateras, Res. Scientist, Institute of Soil Cartography and Classification, Larisa

P. Koukoulakis,
Secretary-General of the HSSS

MALAYSIAN SOCIETY OF SOIL SCIENCE (MSSS)

At the 1991 Annual General Meeting of the Malaysian Society of Soil Science held in April 1991, the following officers were elected:

President	: Dr. Wan Sulaiman Wan Harun
Immediate Past President	: Dr. Sharifuddin Abd. Hamid
Vice President	
Pen. Malaysia	: Dr. Siti Zaayah Darus
Sarawak	: Mr. Patrick Sibat Sujang
Sabah	: Dr. Mohinder Singh Kalsi
Hon. Secretary	: Dr. Sahnshuddin Jusop
Asst. Hon. Secretary	: Dr. Aziz Bidin
Hon. Treasurer	: Mr. Daud Chinta
Asst. Hon. Treasurer	: Mr. Mohamad Sabtu
Members	: Dr. Alias Husin
	Dr. Abdul Manaf Mohd Radzi
	Dr. Ghulam Mohd Hashim
	Mr. Goh Kah Joo
	Dr. Abdul Rashid Ahmad
	Mrs. Anizan Isahak
	Dr. Rosenani Abu Bakar

The Malaysian Society of Soil Science (MSSS) will organize the

"INTERNATIONAL CONFERENCE ON FERTILIZER USAGE IN THE TROPICS (FERTROP)" 24 - 27 August 1992 in Kuala Lumpur, Malaysia.

If interested, please contact the secretary of MSSS.

SOIL SCIENCE SOCIETY OF SOUTH AFRICA

New officers:

President	: Mr. J.J.N. Lambrechts, U.S.
Vice President	: Dr. A.J. van der Merwe, NIGB/SIRI
Past President	: Dr. D.M. Scotney, NIGB/SIRI
Secretary Treasurer	: Mr. T.E. Dohse, NIGB/SIRI
Members	: Mr. H.M. du Plessis, WNK/WRC
	Prof. C.C. du Preez, UOVS/UOFS
	Prof. M.V. Fey, U.N.
	Prof. J.H. Moolman, U.S.

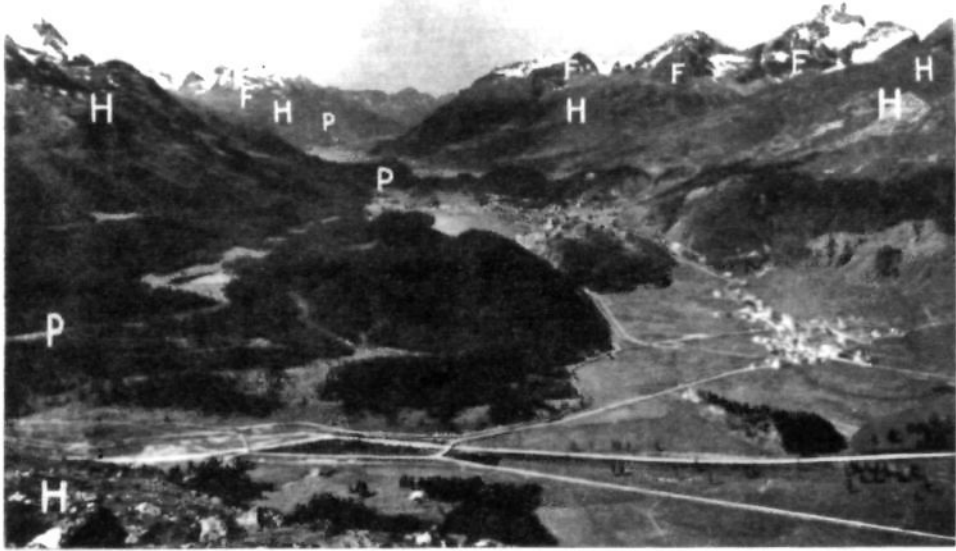
ADDRESS: P.O. Box 30030
Sunnyside 0132
SOUTH AFRICA

Hans Jenny und die Schweizerische Bodenkunde

Am 9. Januar 1992 starb im Kaiser Permanente Medical Center in Oakland (Kalifornien) der weltbekannte Bodenwissenschaftler Prof. Hans Jenny im hohen Alter von fast 93 Jahren. Obwohl Hans Jenny fast seine gesamte wissenschaftliche Laufbahn in den Vereinigten Staaten von Amerika durchlief, hat er seine Schweizerische Herkunft nie vergessen. Sowohl in seinem klassischen Werk *Factors of Soil Formation* (1941) als auch in seinem Spätwerk *The Soil Resource* (1980) nahm er auf Untersuchungen Bezug, welche er in den Schweizer Alpen verschiedentlich durchgeführt hatte.

Hans Jenny wurde am 7. Februar 1899 in Basel geboren. Sein Studium der Landwirtschaft an der ETH Zürich schloss er 1923 als dipl. Ing. Agr. ab. Anschliessend promovierte er beim

bekanntem Kolloidchemiker G. Wiegner (Lehrstuhl für Agrikulturchemie) ebenfalls an der ETH mit einer Arbeit über Kationen- und Anionenumtausch an Permutitgrenzflächen (1927). Trotz seiner laborbezogenen Promotionsarbeit beschäftigte ihn als Agronom der natürliche Boden und seine Bildung unter dem Einfluss der Umweltfaktoren bereits damals. So zeichnete er auf einer einfachen Schulkarte den Versuch einer Schematischen Bodenkarte der Schweiz, deren Konturen er aus topographischen, klimatologischen und geologischen Grundlagenwerken ableitete. 1926 ging er als Rockefeller Stipendiat in die USA, wo er zunächst beim späteren Nobelpreisträger S.A. Waksman arbeitete, bevor er 1928 seine Tätigkeit an der University of Missouri in Columbia aufnahm. Obwohl er sich hier in Lehre und Forschung vorwiegend mit Problemen der Pflanzenernährung abzugeben hatte, beschäftigte er sich weiterhin mit dem Studium alpiner Böden und Bodengesellschaften. Zeugnis davon gibt die heute noch lesbare Arbeit über Hochgebirgsböden im Handbuch der Bodenlehre (E. Blanck, ed. 1930), aus welcher die nachstehende Abbildung entnommen wurde.



Phot. Wehrli Verlag Kilchberg (Zch.).

Abb. ro. Landschaftsbild aus den Zentralalpen (Engadin)

Talboden: 1700-1800 m ü.d.M. Jahrestemp. 1°C,
jährliche Niederschlagsmenge 800 mm, Jahres-NS-Quotient 700.
Waldgrenze: 2100-2300 m ü.d.M.
Schneegrenze: 2900-3000m ü.d.M.

Höchste sichtbare Gipfel: 3300-4300 m ü.d.M.
Bodentypen: { F = Frostboden.
H = alpine Humusböden.
P = Podsolböden.

1936 wechselte Hans Jenny als Professor of Soil Chemistry and Morphology nach Berkeley. Auch nachdem sein wegweisendes Buch *Factors of Soil Formation* (1941) erschienen war, suchte er weiter nach Belegen für seine Theorie der Bodenfunktionen und -sequenzen. So untersuchte er in den frühen sechziger Jahren während eines Aufenthaltes in der Schweiz die Bodenentwicklung im Vorfeld des sich stark zurückziehenden Rhonegletschers. Die scheinbar belanglose Ferienarbeit bildete die Grundlage für vielbeachtete Publikationen und Übersichtsartikel zum Zeitfaktor und fand schliesslich auch Aufnahme in *The Soil Resource* (1980).

Auch wenn Hans Jenny zahlreiche bedeutende Beiträge zur theoretischen Bodenkunde und Bodenchemie geliefert hat, blieb der Boden als lebendiges Naturobjekt stets im Mittelpunkt seines Interesses. So verwundert es nicht, dass er sich in den USA mit grossem Einsatz für die Erhaltung naturnaher Landschaften und Ökosysteme einsetzte. Die Ideen, welche er vor mehr als 50 Jahren entwickelte, bilden heute die Grundlage der modernen Bodenökologie, welche in der Schweiz in besonderem Masse gepflegt wird.

Hans Jenny hat für seine bedeutenden Leistungen zahlreiche amerikanische und internationale Ehrungen erfahren. Die Bodenkunde in der Schweiz verdankt ihm viel. Wir können ihn posthum ehren, indem wir seine Ideen und Erkenntnisse weitertragen.

Hans Sticher, Zürich, Switzerland

**International Relations
Relations internationales
Internationale Beziehungen**

**16th SESSION OF THE GOVERNING COUNCIL
OF THE
UNITED NATIONS ENVIRONMENT PROGRAMME (UNEP)
Nairobi (KENYA) 20-31 May 1991**

At its regular 16th session, the Governing Council of the United Nations Environment Programme (UNEP) considered the major environmental global issues, particularly in light of preparations for the United Nations Conference on Environment and Development (UNCED) which will be convened in June 1992 in Rio de Janeiro, Brazil. The main attention was given to such world-wide problems as climate change, depletion of ozone, biological diversity, toxic and dangerous products and wastes, oceans and inland waters, land degradation and desertification.

It was noted with a great concern that land degradation, particularly in drylands of the world (arid, semi-arid and dry sub-humid areas) where it is referred to as desertification, continues with an alarming rate while the efforts to stop the process are still too modest throughout the world. Desertification affects some 3.6 billion hectares or 70 % of the total area of global drylands, out of which 43 million hectares of irrigated cropland (30 % of the total), 216 million hectares of rainfed cropland (47 % of the total) and 3,333 million hectares of rangeland (73 % of the total) are affected in moderate or higher degree of degradation. By this process, the world is gradually losing its natural resource base for agriculture and animal husbandry at a time when the struggle for food, shelter and energy is intensifying with the progressing growth of the demand imposed by the increase of the world population and human needs. The soil loss and decrease of its productivity due to wind and water erosion, waterlogging, salinization, alkalization and pollution with toxic chemicals progress in all parts of the globe being largely unabated.

The Governing Council requested the Executive Director of UNEP to contribute substantially to preparations for UNCED, including *inter alia* by preparing a comprehensive report on the state of the global environment, where special chapters will be dealing with soil degradation and desertification. The special composite report on the world status of desertification and the progress in implementation of the United Nations Plan of Action to Combat Desertification adopted in 1977, will also be prepared and considered by the Governing Council of UNEP in February 1992 for further forwarding it to the UNCED with appropriate recommendations for action at the national, regional and international levels. It was also recommended that UNEP will contribute substantially to the consideration of the protection and management of land resources through *inter alia* sustainable agriculture development by the UNCED Preparatory Committee.

The problems of soil degradation and desertification were included into the agenda of UNCED by the decision of the United Nations General Assembly of December 1989 as demanding serious attention among the major environmental and development issues facing the world now and through the beginning of the next millennium. The corresponding recommendations for the Earth Charter and the AGENDA-21, a global code of conduct and the programme of actions to address these problems by the world community, are being developed now by the UNCED Secretariat with the assistance of all United Nations agencies and bodies including UNEP.

Concluding its deliberations, the 16th Session of the UNEP Governing Council has authorized substantial increase in the budgetary provisions in the areas of soils and desertification for the biennium 1992-1993 in order to enhance the efforts concerning these important issues.

Boris G. Rozanov, Special Adviser to the Executive Director UNEP

THE DELEGATES' APPEAL OF THE FIRST CONGRESS OF INTERNATIONAL AGRICHEMISTS' AND AGRIECOLOGISTS' ASSOCIATION OF COMMON-WEALTH OF INDEPENDENT STATES AND BALTIC COUNTRIES

Dear colleagues!

In connection with dangerous world ecological situation including, the agricultural branches, agrichemists and agriecologists of our countries combined efforts to solve urgent agrichemical and agriecological problems.

It is stated by agrichemistry the agrichemical means such as mineral, organic, green fertilizers and lime play an important role in provision of world population with high quality food production and decrease radioactive elements pollution.

The high rates of world population increase bring scientists' attention to the question of mankind satisfactory with high quality food products. Scientific and technical progress in world agriculture gives an opportunity to obtain about 40 % yield increase in industrial countries owing to mineral fertilizers application. At present time the science doesn't know territorial and national borders and can play a stabilizing role in society.

We invite you to take part in the work of international agrichemists' and agriecologists' association "Agricolas" for working out perspective fundamental investigations on ecological problems of agrichemistry; for conducting independent complex agrichemical and agriecological public expert of new technologies, traditional and non-traditional agrichemical means which are used and will be created; for developing conditions to agrichemists who are working or will work in agrichemistry and agriecology; for organizing and accomplishing regional, national and international programmes; for creating new technologies which will reduce and improve the soil fertility and will provide optimal balance of biogenic and technogenic elements in agriecosystems; for taking part in the struggle against soil degradation and pollution with different toxic substances.

Our address: 119899 Russia,
Moscow, Leninskie gory,
Moscow State University,
Soil Science Faculty,
President of Association
Prof. V.G. Mineev

Telex: 411 483 MGU SU
FAX: (095) 939-01-26
Tel.: 939-35-44

WOCAT: WORLD OVERVIEW OF CONSERVATION ACTIVITIES AND TECHNIQUES

An Appeal for the Participation of ISSS Members

WOCAT is a new project sponsored by the World Association of Soil and Water Conservation (WASWC) and is intended as a follow-up to the "World Map on the Status of Human-Induced Soil Degradation" published by UNEP and ISRIC in 1990. The project was initiated in July 1991

with an appeal for contributing and corresponding members. Currently, financing is being sought among various donor agencies.

General Aims

WOCAT will contribute toward sustainable utilization of the soil resource by providing a global overview and a summary of existing experience and knowledge in soil conservation.

Background

Soil conservation efforts for over half a century have produced a great deal of information. Unfortunately, this information is widely dispersed in various forms throughout the world. Often, little is known about successes and failures with various techniques and programmes. Nor has any general overview of conservation techniques and activities been prepared on a global scale. The WASWC believes WOCAT will provide such an overview.

Objectives

WOCAT proposes to:

- Compile information on existing conservation techniques and activities/approaches in environmentally degraded areas throughout the world, with details on ecological and technological parameters.
- Report on the extent and efficiency of each technique and activity in relation to area and type of degradation.
- Present the most promising techniques in picture form and on a global map (three sheets; approximate scale: 1:15,000,000).
- Produce a handbook and an expert system of techniques and activities that can be used by field experts and technicians.
- compile a GIS data base and a software expert system on soil erosion and on conservation techniques and activities on a global scale.

Procedure

The first phase of WOCAT will involve developing guidelines for methodological procedures. Simultaneously, an international network of around 100 contributing experts and a greater number of corresponding members will be mobilized throughout the world, with emphasis given to contributors from developing countries. Information on techniques and approaches will be collected from contributing members in a second phase, this information will be evaluated and compiled in a compendium, on global maps, and on computer software. The final phase will involve presentation of the data in the form of a handbook, three maps, and a GIS and software data base. A total of four years is foreseen to complete all phases of the project.

Participation

WOCAT is actively seeking the participation of contributing and corresponding members to join the growing WOCAT network, which now includes almost 50 organizations and individuals in the UK, the US, Sweden, the Netherlands, France, Austria, Hungary, Brazil, Nigeria, India, Pakistan and Indonesia (see the accompanying map, "The Growing WOCAT Network"). A contributing expert will be expected to dedicate approximately one week of his or her working time per year toward the programme. Contributors' names will be listed under "contributing authors" in final publications. A corresponding member will have to evaluate compiled information and add to it if needed, giving about one working day per year to the project. Corresponding experts' names will be listed under "corresponding authors" in final publications.

How to Join WOCAT

If you are interested in either of the above forms of participation, you should first join the WASWC. Membership is only \$ 10 per year. Please send this amount and a brief letter stating your interest in becoming a member of WASWC to:

World Association of Soil and Water Conservation
7515 N.E. Ankeny Road
Ankeny, Iowa 50021-9764
U.S.A.

Then, please send a brief note to the address below, providing your name, institution, position, working background, professional experience, and interest in being a contributing or corresponding member. Most important, please indicate as precisely as possible the area, region, country, continent you know sufficiently to produce information for WOCAT as outlined above (please add sketch map!). Please send all correspondence concerning WOCAT to:

Group for Development and Environment
WOCAT
Quartiergasse 16
3013 Bern
Switzerland
Telephone: +41 31 65 88 22 FAX: +41 31 42 88 43

Hans Humi,
President of WASWC, Berne
Switzerland

The Dublin statement on water and sustainable development

Scarcity and misuse of freshwater pose a serious and growing threat to sustainable development and protection of the environment. Human health and welfare, food security, industrial development and the ecosystems on which they depend, are all at risk, unless water and land resources are managed more effectively in the present decade and beyond than they have been in the past.

Five hundred participants, including government-designated experts from a hundred countries and representatives of eighty international, intergovernmental and non-governmental organizations, attended the International Conference on Water and the Environment (ICWE) in Dublin, Ireland, on 26 - 31 January, 1992. The experts saw the emerging global water resources picture as critical. At its closing session, the conference adopted this Dublin Statement and the Conference Report. The problems highlighted are not speculative in nature; nor are they likely to affect our planet only in the distant future. They are here and they affect humanity now. The future survival of many millions of people demands immediate and effective action.

The Conference participants call for fundamental new approaches to the assessment, development and management of freshwater resources, which can only be brought about through political commitment and involvement from the highest levels of government to the smallest communities. Commitment will need to be backed by substantial and immediate investments,

public awareness campaigns, legislative and institutional changes, technology development, and capacity building programmes. Underlying all these must be a greater recognition of the interdependence of all peoples, and of their place in the natural world.

In commending this Dublin Statement to the world leaders assembled at the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in June 1992, the Conference participants urge all governments to study carefully the specific activities and means of implementation recommended in the Conference Report, and to translate those recommendations into urgent action programmes for WATER AND SUSTAINABLE DEVELOPMENT.

International Union of Biological Sciences

IUBS Executive Committee 1991 - 1994

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Vice-President: Tokindo Okada (Japan)
Vice-President: Vladimir Sokolov (Russia)
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John McNeil (Canada)
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Stephen Stearns (Switzerland)
Osvaldo Sala (Argentina)

Past President: Janos Salanki (Hungary)

The invitation of the French Académie des Sciences to hold the General Assembly in Paris, France, in September, 1994, was unanimously adopted by the General Assembly.

OECD Workshop on Sustainable Agriculture Technology and Practices Paris, France, February 11 - 13, 1992

The Workshop was organized by OECD, the Organisation for Economic Cooperation and Development, and is part of an OECD Programme on Technology and Environment, which is seeking to identify environmentally sustainable technologies in key economic sectors and evaluate policies and mechanisms which OECD governments might pursue to stimulate

innovation and diffusion of such technologies. The attention for the agricultural sector is a result of the concern about the degree to which agriculture is contributing to environmental problems, particularly water and air pollution, land degradation and a decline in landscape amenities and bio-diversity.

The Workshop was attended by most of the OECD member countries and by several international organizations, non-governmental organizations, farmers' groups, industry associations and universities and research institutes. During the Workshop several experts gave presentations on the field of cereal and grain production, fruit/vine and vegetables production, animal husbandry and on trends and opportunities in cross-cutting technologies: bio-technology, deforestation/forestation, monitoring ecological sustainability in agro-ecosystems and the implication of global warming for sustainable agriculture.

The Workshop took a step in moving towards a positive and constructive dialogue on how to move all forms of agriculture towards sustainability. The participants welcomed the technological focus and the opportunity to exchange information on concepts and technological opportunities. While there was consensus on the need to reform current agricultural policies and practices, there was understandably no single solution. Some major features mentioned were: responsibility of farmers for the change-over from conventional to sustainable agriculture and for governments to facilitate decision making through policy instruments, the need for knowledge-intensive site-specific whole-farm management using a system approach, reduction or alleviation of negative effects of agricultural practices, to guide farmers in the transition to sustainable farming techniques and inform consumers through quality labelling.

During the Workshop it was emphasized that sustainable agriculture is one way to protect soils from chemical and physical degradation. The growing global demand for food asks for well managed sustainable agriculture that has a potential to produce food in the future, is not contributing to environmental problems and is able to resist natural and/or human-induced environmental stresses.

The general conclusion was that to encourage the transition, policies must foster innovation, development and adapt improved agricultural technologies and practices, within the context of an economically efficient and competitive agricultural sector preserving the environment and the resource base into the future. As a follow-up of the Workshop OECD intends to explore possible options, some are: facilitate exchange of technical information among scientists and farmers employing biological or integrated practices, to organise a workshop on sustainable agriculture and information transfer to non-member countries in cooperation with UNEP and FAO, and to organize a workshop on forestry and agriculture to explore in greater detail the role of forestry in sustainable agriculture.

G.J. van den Born,
National Institute of Public Health and
Environmental Protection (RIVM),
Global Change Department
Bilthoven, The Netherlands

COUNTRY STUDIES ON BIODIVERSITY TO ASSESS NEEDS AND BENEFITS

Somewhere between USD 200 million and USD 50 billion per year is what it will cost to meet the basic needs for environmental conservation in the developing countries. To get a more precise idea of the costs and potential benefits, and to help the negotiations for a convention on biological diversity, the United Nations Environmental Programme, UNEP, has launched a project to study the biological diversity of countries.

Fourteen countries are now working on detailed studies of their biological diversity. For the studies, the various known species are repertoried - virus to daffodil to elephant - and an estimate is made of the number of unknown species. Endangered species, and species that have become extinct are noted, as well as known changes in populations. Apart from species, the studies list the various habitats of the countries: forests, wetlands, mountains, deserts and "hot spots", areas with many species that are found nowhere else.

In addition, the studies encompass what is known about the status of conservation, and existing facilities for its conservation - protected areas, and man-made reservoirs of biological diversity - zoological and botanical parks and gene banks.

The project is related to UNESCO's research project on biological diversity - Bio-D, which aims to create a better understanding of the role and function of biological diversity for the life of the planet and its environment.

BOTH STUDIES WILL BE USED AS A BASIS FOR THE NEGOTIATIONS ABOUT THE CONVENTION ON BIOLOGICAL DIVERSITY, WHICH IS EXPECTED TO BE READY FOR SIGNATURE AT THE UNITED NATIONS CONFERENCE ON ENVIRONMENT AND DEVELOPMENT, UNCED, IN JUNE 1992 IN RIO DE JANEIRO. Negotiations also cover the issue of whether there should be a special fund for development and conservation projects coupled to the convention.

THE FIRST BATCH OF COUNTRY STUDIES ON THE BAHAMAS, CANADA, COSTA RICA, GERMANY, GUYANA, INDONESIA, KENYA, MALAYSIA, NIGERIA, PERU, POLAND, THAILAND AND UGANDA ARE EXPECTED TO BE DONE IN JANUARY OR FEBRUARY. AUSTRALIA HAS ALSO STARTED PREPARING ONE, AND SEVERAL OTHER COUNTRIES HAVE EXPRESSED INTEREST IN DOING STUDIES OF THEIR OWN

"No new research expeditions are being made to discover new and unknown species for the studies. The studies are put together using existing information - new surveys would take too long and cost too much," says Peter Dogsé, associate expert in UNESCO's Division of Ecological Sciences, and a member of the multidisciplinary advisory team for the UNEP project.

Repertorying all existing species would in fact take quite some time. Only a fraction of the existing biological diversity is known; about 1.5 million species have been identified and repertoried, whereas the estimates of the total number of species on the planet go from 5 to 80 million ...

However, the studies will help to pinpoint priority areas, the places where conservation measures are needed most urgently, and to find the best ways of estimating costs and benefits of biodiversity conservation. At the same time, by involving administrators, scientists, non-governmental groups etc in the work, they encourage discussion on a national level and bring together competent people who can then assess benefits, costs and needs in their country.

Part of the work consists of estimating the value of biological diversity; what can be gained by conserving it, and why conserving it can be more profitable than destroying it.

"It is difficult to assess the financial value of unknown biodiversity, but one can assume that since the known species produce such and such a value, the unknown ones - of which there are many more - must also be potentially valuable", says Dogsé.

One country that is taking action to find out what biological diversity it has in its environment, and what it could be used for, is Costa Rica. Its Institute of Biodiversity, INBio, has signed a deal with the international pharmaceutical firm Merck, which gave the firm the right to screen the plant and invertebrate species of Costa Rica for biologically active molecules, which could be used as a basis for pharmaceuticals.

In return INBio receives a down payment of USD one million, training opportunities, and in the future, royalties on products developed by Merck. This money, which over time could amount to very substantial sums, is to be used for conservation of Costa Rica's tropical forests.

INBio uses Merck's support to produce a complete biological inventory for Costa Rica. This project will involve cataloguing an estimated 500,000 species, most of which are still unknown to science.

UNESCO-PRESS

STRING

Generation of a Cartographic and Bibliographic Information System of Soils and Terrain Resources Data for the Region of the Sahara and Sahel Observatory

Name: **STRING** (Soil and Terrain Resources Information Network Generation)
Executed by: International Soil Reference and Information Centre (ISRIC)
Duration: One year, starting June 1992
Funded by: Caisse Centrale de Coopération Economique (CCCE), France

STRING is a project carried out for the Sahara and Sahel Observatory (L'Observatoire du Sahara et du Sahel - OSS). It is concerned with the systematic inventory of existing cartographic and bibliographic documentation on soils and terrain resources, including organizational details of the national and regional institutions responsible for resources inventories. The twenty African states involved are Algeria, Burkina Faso, Cape Verde, Chad, Djibouti, Egypt, Ethiopia, Gambia, Guinea-Bissau, Kenya, Libya, Mali, Morocco, Mauritania, Niger, Senegal, Somalia, Sudan, Tunisia and Uganda and their regional and international organizations. External partners are (inter)national donor agencies, United Nations organizations and all institutions having relations with partners within the region.

STRING will collect information about SOIL AND TERRAIN RESOURCES, including also selected data on land use and climate.

The OBJECTIVE of STRING is to strengthen communication between and among politicians, development officers and scientists in the region and to enable a more efficient use of existing cartographic and bibliographic information about soils and terrain resources.

The main OUTPUTS will be:

- 0 an orderly arrangement of soils and terrain resources data for the OSS region, in the form of a systematic, open-ended, computerized information system with access for a wide array of users,
- 0 the basis of an operational network of institutions and individual specialists.
- 0 a comprehensive report on the inventory of information with hard copies in English and French

The INFORMATION SYSTEM will, both at the national and international level,

- 0 provide an information service for regional and national planning,
- 0 directly benefit agricultural research agencies, soil and land conservation agencies, as well as agencies involved in nature conservation.
- 0 help to reveal gaps in subject information and in cartographic coverage and to identify problems with compatibility of cartographic materials between countries.

The STRING NETWORK will

- 0 facilitate exchange of information between institutions at all levels,
- 0 strengthen institutional capacity through mutual transfer of knowledge

Ultimately, efforts may lead to joint and harmonized efforts in conservation of nature and safeguarding sustainable food productivity

ISRIC would be very pleased if it could get into contact with potential cooperating persons and institutes in the region and elsewhere.

Please contact:

Paul J.M. Mulder, Project Coordinator OSS-STRING
ISRIC, P.O. Box 353, 6700 AJ Wageningen, The Netherlands.
Tel: (31) 8370 19063; Fax: (31) 8370 24460; Tlx via 45888, intas, nl; E-mail
ISRIC@RCL.WAU.NL

NEW EUROPEAN ORGANIZATION:

ECART (European Consortium for Agricultural Research in the Tropics)

ECART, a new consortium was founded by four European organizations and presented to the public through their "Amsterdam Declaration" of 15 May, 1992: the Centre de Coopération Internationale en Recherche Agronomique pour le Développement (CIRAD, France), the Instituto de Investigação Científica Tropical (IICT, Portugal), the Koninklijk Instituut voor de Tropen (KIT, The Netherlands), and the Natural Resources Institute (NRI, United Kingdom).

The objectives of ECART are:

- to respond to the demands of developing countries, mainly by strengthening their agricultural research systems through technology development and long-term institution building;
- to contribute to the development of operational policies for the rural development and natural resources sectors;
- to seek to ensure that the developmental significance of agricultural research in the tropics is understood by policy-makers in developed and developing countries and that decisions about resource allocation give appropriate weight to it;
- to improve the effective contribution to work in these areas by joining the capacity of European organisations with that of national agricultural research systems and national

development agencies, and to collaborate with other parts of the international scientific community.

The consortium will pursue its objectives by:

- seeking to integrate the policy perspectives and research efforts of the member organisations in fields of common interest;
- promoting contact and dialogue with national agricultural research systems and development agencies, with other parts of the scientific community and with funding agencies;
- undertaking joint research programmes and development projects commissioned by the funding agencies; and
- building joint capacities for training, information and documentation.

Further information on ECART can be obtained from:

- CIRAD/ECART Secretary, Pierre L. Dubreuil, 42, rue Scheffer, F-75116 Paris, France; Tel: (33-1)47-04-32-15; FAX: (33-1) 47-04-31-85; Telex: 648 729 f
- IICT/ECART Secretary, António Melo, R. Junqueira, 86-1, P-1300 Lisbon, Portugal; Tel: (351-1)364-5071; FAX: (351-1) 364-2008; Telex: 66932 iict
- KIT/ECART Secretary, Bram Huijsman, Mauritskade 63, NL-1092 AD Amsterdam; Tel: (31-20) 5688-7111; FAX: (31-20) 5688-444; Telex: 15080 kit nl
- NRI/ECART Sec. Guy Poulter, Central Avenue, Chatham Maritime, Kent ME4 4TB, UK; Tel: (44-634)88-00-88; FAX (44-634)88-00-66 or 88-00-77

Facts About IFS - The International Foundation for Science

1. IFS is a nongovernmental organization with a membership of 92 scientific academies and research councils in 77 countries. Of its members, 75 % are in developing countries. The IFS office is located in Stockholm and has a staff of 18 persons.
2. The Foundation supports young scientists of merit from developing countries to do research in such countries. Their research must be within specific research areas. Until mid-1990, IFS has supported 1715 grantees in 92 countries. About 200 new grantees are added each year.
3. The financial support given by IFS is in the form of research grants of individual scientists. The maximum grant is US\$ 12000 and this amount is renewable up to three times. The grants are mainly meant to enable the researchers to purchase equipment, expendable supplies, literature etc., and do not provide for salaries or honoraria to the researchers.
4. The IFS Purchasing Department can arrange purchasing and delivery of equipment, supplies, etc., on behalf of the grantees.
5. As of today, IFS has seven scientific areas in its programme: aquaculture, animal production, crop science, forestry/agroforestry, food science, natural products and rural technology. Both basic and applied research can be supported.
6. Regional workshops and training courses are arranged for the grantees. Special travel grants can be given to grantees to attend scientific meetings.
7. The IFS budget is currently about US\$ 5 million per annum, based on regular contributions from mostly governmental sources in 14 countries (Australia, Belgium, China (Taipeh), Denmark, Germany, Finland, France, Japan, The Netherlands, Nigeria, Norway, Sweden, Switzerland, USA) and from a number of national and international development agencies,

including the World Bank, UNESCO, UNDP, UNFSTD, CTA-EEC, IDRC (Canada) and ODA (United Kingdom).

8. Further information and grant application forms can be obtained from:

International Foundation for Science

Grev Turegatan 19

S-114 38 Stockholm, SWEDEN

Tel: +46-8-791-29-00; Telex: 13722; FAX: +46-8-660-26-18

ICRAF (International Centre for Research in Agroforestry)

Change of Name

In June 1991, ICRAF joined the CGIAR. The Board of Trustees has changed ICRAF's name - from International Council for Research on Agroforestry to International Centre for Research in Agroforestry.

Development of forestry research within the Consultative Group on International Agricultural Research (CGIAR) system

The Australian Centre for International Agricultural Research (ACIAR) was appointed by the CGIAR in May 1991 to implement its decision to establish a new international entity to undertake forestry research.

The name of the new institution is **Center for International Forestry Research (CIFOR)**. This name retains the traditional forestry flavour, clearly identifies the entity as an international center, and has an additional advantage in that the same acronym can be used for the English, Spanish and French spelling of the name.

CIFOR will operate from a Headquarters with regional nodes in the major tropical forest regions of the developing world. During Centers' Week the CGIAR confirmed the desirability of the Headquarters being in a developing country of the Asian region; to this end, ACIAR has invited about a dozen countries of the region to submit capability statements supporting their consideration as host country for CIFOR's Headquarters. It is anticipated that these capability statements will be appraised by ACIAR early in 1992 and this will involve detailed discussions with those countries whose capabilities most closely match the selection criteria established for such a Headquarters.

Regional nodes will be established in Africa and in Latin/Central America, taking advantage of the CGIAR ecoregional centers and other regional or national forest research institutions which are in a position to collaborate with CIFOR on strategically-based, process-oriented research.

The timing of establishment of the regionally-based programs will depend on the development and implementation of the strategic research plan and the concomitant scheduling of resources and staffing. However, in the spirit of responding positively to the CGIAR's desire to see these programs implemented as a matter of priority, the implementation of the research program will proceed on a broad front involving all three regions at much the same time. The aim is to initiate

the research program in the latter half of 1992.

The following priority activity areas are planned:

- Germplasm - exploration/conservation, management
- Selection and breeding for improvement of tree species
- Improved management of natural forests
- Improved productivity of forest plantations
- Ecosystem dynamics
- Utilization and management options for lesser known forest products
- Socioeconomic, policy and marketing research
- Strengthening national research systems

The tenor of concerns within the CGIAR at this time devolves upon ecological, socioecological and environmental aspects, within the overall context of sustainable production systems for the wellbeing of peoples of developing countries.

**APPOINTMENTS, HONOURS
NOMINATIONS, DISTINCTIONS
ERNENNUNGEN, AUSZEICHNUNGEN**

The following scientists have been elected **Fellow of the Soil Science Society of America in 1991**:

Paul R. Bloom, Yona Chen, David C. Coleman, Owen Thomas Denmead, John H. Cushman, John W. Doran, William T. Frankenberger, Jr., Charles R. Frink, Glendon W. Gee, Jerry L. Hatfield, C. Steven Holzhey, Patrick G. Hunt, Edward T. Kanemasu, Stephen Pawluk, Andrew N. Sharpley, and Neil E. Smeck.

Other SSSA awards were given to Frank J. Stevenson, Frank G. Viets, Jr., K.A. Barbarick, Malcolm E. Sumner, Paul W. Unger, Hari Eswaran, John J. Mortvedt, Donald L. Sparks, and Jay Matthew Ham.

Dr. James L. Walker, a long term member of the International Society of Soil Science, has received the Inter-American Agricultural Medal for the 1990 - 1991 biennium. The 33 member-nations of this hemisphere's Interamerican Board for Agriculture unanimously awarded this medal to Dr. Walker for his outstanding contributions to the development of agriculture and to the improvement of rural life in the Americas over the past 25 years, during which time he has worked collaboratively with scientists throughout the Americas and the Caribbean. He made available to low-income farmers the results of his pioneering experimental work on soils, and his method for testing soil fertility and crop response is now the one most widely used throughout the entire Central American region.

The Inter-American Agricultural Medal is the highest such award in the Americas and is granted once every two years, to one person only. This award is conferred for the purpose of publicly recognizing and encouraging the outstanding efforts and merit of persons whose work has made major contributions to agricultural development and rural well-being in IICA's Member States. It was first awarded in 1959.

**Werner L. Nelson Award
and
Soil Science Research Award**

Malcolm E. Sumner is Regents' Professor of Soil Science in the Department of Agronomy and a faculty member in the Institute of Ecology at the University of Georgia. His research includes the use of the Diagnosis and Recommendation Integrated System (DRIS) as a tool in improving fertilizer recommendations to sustain or improve productivity while preserving the environment. He also has worked on developing agricultural uses for such waste products as phospho- and flue gas, desulfurization gypsum, and fly ash, and in devising strategies to stabilize these materials with vegetation when stacked.

(Agronomy News, U.S.A.)

M.L. and C.M. Jackson Soil Science Award

Donald L. Sparks, professor of soil physical chemistry and chair of the Department of Plant and Soil Sciences at the University of Delaware, won the Marion L. and Chrystie M. Jackson Award. He holds degrees from the University of Kentucky and Virginia Polytechnic Institute and State University. His research has focused on the kinetics of soil chemical phenomena, the physical chemistry of soil potassium, the surface chemistry of soils and soil components, and recently,

organic pollutant interactions on soil components. Dr. Sparks is a Technical Editor for "Soil Science Society of America Journal", and Editor of "Advances in Agronomy". He also has served as Chair of Division S-2.

(Agronomy News, U.S.A.)

Bouyoucos Soil Science Distinguished Career Award

Frank J. Stevenson is Professor Emeritus of soil chemistry at the University of Illinois. He received degrees from Brigham Young University and Ohio State University. His research has focused on the chemistry of soil organic matter. Dr. Stevenson is a Fellow of SSSA and ASA, and has received the Agronomic Research Award and SSSA Research Award. He also has received the Paul A. Funk Recognition Award and the Senior Research Award from the College of Agriculture at the University of Illinois.

(Agronomy News, U.S.A.)

International Soil Science Award of the SSSA

Dr. Hari Eswaran, national leader for World Soil Resources at USDA-SCS in Washington, DC. He holds degrees from the University of Malaya, Malaysia, and University of Ghent in Belgium. Dr. Eswaran was elected as a member of the Belgian Academy of Overseas Sciences, and Chair of Commission V of the International Society of Soil Science. He is the author or coauthor of more than 120 publications and has edited several monographs and books.

(Agronomy News, U.S.A.)

Soil Science Distinguished Service Award

Frank G. Viets Jr. retired from the USDA-ARS in Ft. Collins, CO, in 1974. He holds degrees from Colorado State University and the University of California, Davis and Berkeley. His research includes nitrogen metabolism in corn, and diagnosis and control of zinc deficiency of field crops on the newly irrigated lands of the Columbia Basin in Washington and other western states. Dr. Viets is a honorary member of SSSA and a Fellow of ASA and SSSA. He has served as President of the Western Society of Soil Science and SSSA, and as associate editor of "Soil Science Society of America Journal"

(Agronomy News, U.S.A.)

Soil Science Professional Service Award of the SSSA

Dr. John J. Mortvedt is a senior scientist at the National Fertilizer and Environmental Research Center of the Tennessee Valley Authority in Muscle Shoals, AL. His research contributions include micronutrient fertilizer technology and use, as well as environmental effects of fertilizer use. Dr. Mortvedt has also promoted effective use of micronutrient fertilizers for optimum crop production in the USA and around the world. He is a Fellow of ASA and SSSA, and has served as Chair of Division S-8, and as Editor-in-Chief and President of "Soil Science Society of America Journal".

(Agronomy News, U.S.A.)

Soil Science Applied Research Award

Paul W. Unger is a supervisory soil scientist and research leader at the USDA-ARS Conservation and Production Research Lab in Bushland, TX. His research has involved development of conservation tillage systems for conserving water and improving crop yields, and the effects of these systems on physical properties of soils in the semiarid southern Great Plains. Dr. Unger is a Fellow of SSSA and ASA, and has served as Chair of Division S-6, and as an Associate Editor of the "Soil Science Society of America. Journal".

CATIE (Tropical Agriculture Center for Research and Education)

New Director General

Dr. Rubén Guevara Moncada, a Honduran, took over the office of Director General of CATIE in Costa Rica on March 1st, 1992, from Rodrigo Tarté. He holds a Ph.D. in forestry from the University of Idaho, and a specialization in business administration from Harvard University and has served as Vice-Minister of Natural Resources in Honduras, as Managing Director of the Regional Forestry College (ESNACIFOR), as Manager of the National Applied Forestry Research Center in Honduras, as Manager of Fiberboard Research and Development at Weyerhaeuser Company in the USA and as Assistant Professor at the University of Idaho, USA

VIRGINIA TECH

New Director of International Research

Dr. S.K. DeDatta has joined the Virginia Tech faculty as director of international research and development and professor in the Department of Crop and Soil Environmental Sciences. He will provide major leadership in international research, training and technology transfer and will participate in graduate committees and seminars. Dr. DeDatta comes to the university after 27 years at the International Rice Research Institute where he was head of agronomy and program leader and principal scientist in rainfed lowland rice ecosystems. Much of his research was devoted to improving fertilizer, soil, and crop management practices for rice.

IN MEMORIAM

HANS JENNY, 1899 - 1992

Hans Jenny, a world authority on soils and their formation, died on Jan. 9 at Kaiser Permanente Medical Center at the age of 92.

A Professor Emeritus of Soil Science at the College of Natural Resources of the University of California at Berkeley, he died of complications from prostate cancer.

Jenny's contributions to the study of soil have had a major impact on many scientific fields, ranging from agriculture, soil conservation and ecology to geography and geology. Last October he was honored at a symposium in Denver commemorating the 50th anniversary of the publication of his seminal book, "Factors of Soil Formation" (1941).

"Hans was one of the most outstanding philosophers and thinkers in the area of soil science, and his death marks the passing of an era," said Dean and Soil Physicist Wilford R. Gardener of the UC College of Natural Resources.

Jenny and his wife Jean also actively worked to preserve numerous wildlands in California and the West, so that future generations of soil scientists could "see what nature did with soils prior to human disturbances."

A native of Switzerland, Jenny first came to the United States in 1926, and joined the Berkeley faculty in 1936. He retired in 1967, but continued to write and conduct research until last year. He published his last book in 1980, "The Soil Resource, Origin and Behavior."

It was during his retirement that he became active, along with his wife Jean, in studying and preserving natural areas around the state of California. In particular, they were instrumental in preserving the famous pygmy forest in Mendocino County, as part of the Jug Handle State Reserve

Until late last year, Jenny spent time in the field studying this unique forest, which he referred to as an "ecological staircase". He and retired Professor of Forestry Arnold Schultz of the College of Natural Resources considered the marine terrace and its various forest zones the oldest ecosystem in America, having undergone little significant change in the past million years.

Jenny also continued to consult with many state and federal agencies on soil quality on public lands, and to provide advice to government agencies on ways to improve crop production in the United States.

Throughout his career Jenny's primary interest was Soil Chemistry. Born in Basle, Switzerland on Feb. 7, 1899, he received a bachelor's degree in Agriculture (1923) and a doctorate in Agricultural Chemistry from the Federal Institute of Technology in Zurich (1927). Arriving in the United States in 1926, he served a year as a Rockefeller Foundation Fellow working with Nobel laureate S.A. Waksman, and in 1928 joined the faculty of the University of Missouri, Columbia, where he studied and taught Plant Nutrition as it related to soils.

In 1936 he moved to Berkeley as an Associate Professor of Soil Chemistry and Morphology. Jenny soon became a Professor of Soil Science and chaired that Department from 1943 - 1949.

While at Berkeley he published his most influential book, "Factors of Soil Formation." The book's importance to soil science has been compared with the impact Sir Charles Lyell's "The Principles of Geology" and Charles Darwin's "The Origin of Species" had on our understanding of the earth and the evolution of life.

"This book is the foundation of all our current thoughts and ideas on how soils are formed," said Ronald Amundson, Associate Professor of Soil Science, College of Natural Resources.

The book came out at a time of declining soil fertility in the midwestern farm belt, and contributed to the scientific study of cropland sustainability and to maintenance of the quality of the soil. Jenny advocated treating the soil as a living thing, whose health is essential to the health of the ecosystem.

Jenny was able to quantify the factors that influence soil properties, and thereby establish a scientific basis for studying their development and evolution, a field known as Pedology. These influences - climate, the types and numbers of living organisms in soil, the topography or "lay of the land", the types of rocks present, and the age of the landscape - had been recognized qualitatively for years. What Jenny did, Amundson says, is provide the theoretical foundations and perspective that turned Pedology into a quantitative science.

Jenny was the recipient of two prestigious Guggenheim Fellowships and has received honors from organizations such as the Soil Conservation Society, The Soil Science Society of America, and the American Society of Agronomy. He also was an honorary member of the International Society of Soil Science and served as President of the Soil Science Society in 1949.

He was awarded an honorary Doctor of Laws Degree from Berkeley upon his retirement in 1967, and received the Berkeley Citation on the occasion of his 90th birthday in 1989. He holds an honorary doctorate from the University of Giessen in Germany.

In 1982 he and his wife received a Certificate of Appreciation from The Nature Conservancy for their contributions toward the protection of the Jepson Prairie Preserve, a 1000-acre preserve in California's Sacramento River delta. They also were instrumental in establishing the Apricum Hill laterite preserve near Ione, now operated by the Nature Conservancy, and the Mt. Shasta Mudflows, a U.S. Forest Service Research Natural Area. The two were elected Fellows of the California Native Plant Society in 1981.

Jenny is survived by his wife Jean of Berkeley, and a son and daughter from a previous marriage: Edward Jenny of Orinda and Joanna Jenny Coons of Davis.

A Hans Jenny Memorial Fund has been established to which contributions can be made to continue the work he and his wife have done in getting wildlands set aside as nature preserves. Contributions to the fund can be made in care of the Sierra Club Foundation, 220 Sansome St., San Francisco, CA 94104

Suzanne Clark, Berkeley, California

Dr. F. van der Paauw (1905 - 1992)

Frans van der Paauw passed away on 14 July, 1992, in Zuidlaren, The Netherlands. In 1929 he graduated at Utrecht University and in 1932 he obtained his doctor's degree following a study on "The indirect action of external factors on photosynthesis". In 1934 he was appointed research officer at the Institute for Soil Fertility Research, then called the State Agricultural

Experimental Station for Arable Crops and Grassland. In 1953 he was appointed head of the Department of Fertilization of Arable Crops and Grassland, and in 1957 he became head of the Department of Plant Nutrition and advisor to the director. He was appointed lecturer at the Faculty of Botanic Agronomy, Groningen University, in 1950. His first public lecture was on "Interactions of agricultural and botanical studies". The subject is typical for Van der Paauw's work.

During the 35 years of his professional career Van der Paauw published some 200 papers, in different languages. He tested various extraction techniques for the analysis of, mainly, soil phosphorus and potassium.

He was one of the leading research workers on the calibration of soil data for fertilizer recommendations. Later on this work was extended to micronutrients (boron and copper). His nitrogen fertilizer recommendations, adjusted for the preceding winter rainfall, were notorious.

Van der Paauw was a respected guest and a well-known speaker at many international congresses and meetings. His contacts were useful for the institute as a whole. In 1965 Van der Paauw became Knight in the order of Orange Nassau, in Royal recognition of his outstanding services to the agricultural science in the Netherlands. He was also a Corresponding Member of the Federation of German Agricultural Research Institute (VDLUFA). Finally, he was a member of the International Working Group of Soil Fertility (Commission IV of the ISSS).

Van der Paauw remained active after his retirement, in 1973 he was invited by the Pontificiae Academiae Scientiarum to give a lecture on "Adjusting fertilizer rates to soil fertility levels on the basis of soil testing". A comprehensive paper on the basic principles of the evaluation and calibration of soil testing methods was completed in 1980 (FAO Soils Bulletin 38/1). In the meantime he lectured in Brazil for a period of six months.

Frans van der Paauw was a warm and caring man. He is survived by his wife and seven children.

K.W. Smilde, Haren, The Netherlands

DOLF SCHÖNAU

SciNat, Land Ir (Wag), DSc For (Stell), MSAIF

It is with a sense of great sadness that we have to announce the death of Dr. Dolf Schönau on 2 November 1991 after a year-long battle against cancer.

Adolf Paul Georg Schönau was born in Rotterdam, Holland, in 1928. He graduated with a MSc degree in Tropical Forestry at Wageningen University in Holland in 1955. He married Beatrice Schneiter in 1956 and shortly thereafter they emigrated to South Africa. Dolf spent the following five years with the Department of Forestry and obtained his DSc For (Stell) in 1969 for his work on a site evaluation study in black wattle. Over the next 30 years he established his indelible mark on forestry, both nationally and internationally. Much of the high esteem which the ICFR presently enjoys, is attributable to his work and inspiration.

Throughout his years of endeavour, Dolf has received the quiet and selfless support of Beatrice. To her, Frederik and Mark, we extend our sympathies.

Institute for Commercial Forestry Research
University of Natal,
Pietermaritzburg, South Africa

**MEETINGS, CONFERENCES, SYMPOSIA
REUNIONS, CONFERENCES, SYMPOSIA
TAGUNGEN, KONFERENZEN, SYMPOSIEN**

Meetings etc. marked with (*), are organized or approved by ISSS.

Les réunions, etc., marquées d'un astérisque (*) sont organisées ou autorisées par l'AISS.

Tagungen usw., versehen mit (*) werden von der IBG organisiert oder sind von dieser autorisiert.

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Important Notice

ISSS, as an associate member of the International Council of Scientific Unions, subscribes to the principle of free movement of bona fide scientists; patronage or sponsoring will therefore *automatically be withdrawn if the country of venue denies or purposely delays visa awarding to any ISSS member who wishes to participate in the meeting concerned.*

1992

*** Symposium on Soil Resilience and Sustainable Land Use**, Budapest, Hungary, 28 September - 2 October, 1992.

Information: Prof. I. Szabolcs, Chairman of the Organizing Committee, Research Institute for Soil Science and Agricultural Chemistry of the Hungarian Academy of Sciences, H-1022 Budapest, Herman O. út 15, Hungary (Tel.: (36-1)155-8829; Fax: (36-1)155-8839; Telex 22-7223 AGROK-H).

ISOSC 8th International Congress on Soilless Culture, Rustenburg, South Africa, 2-9 October 1992.

Information: ISOSC, P.O. Box 52, 6700 AB Wageningen, The Netherlands.

Conference on Engineering in Agriculture, 1992 - Quality Soils, Quality Food, Quality Environment, Albury, NSW, Australia, October 4 - 7, 1992.

Information: The Convention Administrator, Conference on Engineering in Agriculture 1992, AE Conventions, 11 National Circuit, Barton ACT 2600, Australia, Phone (06) 2706 549, FAX: (06) 2732012.

International Congress on Agro-Ecosystem Modelling, Braunschweig, Germany, 5-9 October 1992.

Information: Institute of Geography and Geoecology, Technical University of Braunschweig, Langer Kamp 19c, W-3300 Braunschweig, Germany

*** International Workshop on Modelling Strength and Stress Distribution in Unsaturated Structured Soils**, Kiel, FRG, 5-9 October 1992.

Information: Prof. Dr. Rainer Horn, Institute of Plant Nutrition and Soil Science, Olshausenstr. 40, 2300 Kiel 1, FRG (Tel.: 0431 880 3190; Fax: 0431 880 2940).

International Conference "Physical Chemistry and Mass-Exchange Processes in Soils", Pushchino, Moscow Region, Russia, 12-16 October 1992.

Information: Dr. A.A. Ponzovsky, Institute of Soil Science and Photosynthesis, Academy of Sciences of Russia, Pushchino 142292, Moscow Region, Russia (Telex: 205128 SOIL SU)

International Symposium on Environmental Contamination in Central and Eastern Europe, Budapest, Hungary, October 12 - 16, 1992

Information: Budapest '92, CBTR, Florida State University, 2035 East Paul Dirac Drive, 226 HMB, Tallahassee, FL 32310-3700, USA

Thermal Behaviour of Clays, Leuven, Belgium, 23 October, 1992
Information: Leuven Clay Processing Group, Dr. J. Decler, Tussenwege 37, B-9920 Lovendegem, Belgium

Symposium sobre la Raña, Madrid, España, 26-30 de octubre de 1992.

Information: Dra. Ascensión Pinilla, Centro de Ciencias Medioambientales, C/Serrano, 115 - dpldo., 28006-Madrid, España (Tel.: 91/262 50 20; Fax: 91/564 08 00).

Managing Water Resources During Global Change. 28th Annual Conference and Symposium of the American Water Resources Association, Reno, Nevada, USA, 1 - 5 November 1992.

Information: Raymond Herrmann, WR-CPSU, Colorado State University, Fort Collins, CO 80523, USA, Fax: (1-303)491 2255

Annual Meeting of the Soil Science Society of America (together with the American Society of Agronomy and the Crop Science Society of America), Minneapolis, Minnesota, 1-6 November 1992.

Toward Sustainable Environmental and Resource Management Futures for Sub-Saharan Africa, Accra, Ghana, 2-6 November 1992.

Information: Prof. Walther Manshard, Schwarzwaldstr. 24, D-7812 Bad Krozingen, Germany (Tel.: (49)76333488).

*** International Conference on Cryopedology**, Pushchino, Moscow Region, USSR, November 10-14, 1992.

Information: Secretariat of the International Conference on Cryopedology, Institute of Soil Science and Photosynthesis, USSR Academy of Sciences, Pushchino, Moscow Region, 142292, Russia (Telex: 205128 SOIL SU).

Joint Russian-American Seminar on Cryopedology and Global Changes, Pushchino, Moscow Region, Russia, 15-16 November 1992 (immediately after the 1st Intern. Conference on Cryopedology).

Information: Prof. Dr. D.A. Gilichinsky, Institute of Soil Science and Photosynthesis, Academy of Sciences of Russia, Pushchino 142292, Moscow Region, Russia (Telex: 205128 SOIL SU).

VIII Seminario Científico del Instituto Nacional de Ciencias Agrícolas (INCA), La Habana, Cuba, 18, 19 y 20 de Noviembre de 1992.

Information: Ing. Rodolfo Plana Llerena, C.Dr., Secretario Ejecutivo, VIII Seminario Científico, Instituto Nacional de Ciencias Agrícolas, Gaveta Postal No. 1, San José de las Lajas, La Habana, Cuba (Tel.: 6 3773; Telex: 056 115 INCA CU).

*** 2nd International Symposium on Forest Soils**, (hosted by CVG-EDELLCA), Guri-Ciudad Guayana, Venezuela, November 22 - 27, 1992.

Information: 2nd ISFS, Comité Organizador, Instituto de Silvicultura, Fac. Ciencias Forestales, Universidad de los Andes, Mérida 5101-Venezuela.

Colloque International: Préservation des Eaux et des sols dans des bassins versant de roches marneux en milieu semi-aride, Sidi M'Hamed Ben Aouda - Relizane/Algérie, 29 novembre à 3 décembre 1992.

Information: H. Paschen, GTZ, Bureau d'Administration des Projets, B47 Patrimoine Algérois, 16050 Kouba/Alger - Algérie.

6th IFA/FADINAP Regional Fertilizer Conference for Asia and the Pacific, Bali, Indonesia, 30 November - 2 December 1992.

Information: L.M. Maene, Secretary General IFA, 28 rue Marbeuf, 75008 Paris, France (Tel.: (33)1-42252707; Fax: (33)1-42252408).

Scientific Symposium on the Human Dimensions of Global Environmental Change, Paris, France, November/December 1992.

Information: Evelyne Blamont, International Social Science Council, Maison de l'Unesco, 1 rue Miollis, 75015 Paris, France, Fax: (33-4) 43 06 87 98

*** International Conference of Commission IV on Improving Soil Management for Intensive Cropping in the Tropics and Sub-Tropics**, Dhaka, Bangladesh, early December 1992.

Information: President of the Soil Science Society of Bangladesh Dr. A.K.M. Habibullah, 6/10, Lalmatia, Satmasjid Road, Dhaka-1207 Bangladesh (Tel.:325166-70).

International Conference on Nutrition, Rome, Italy, 5 - 11 December, 1992
Information: FAO/WHO Joint Secretariat for the Conference, Viale delle Terme di Caracalla, 00100 Rome, Italy, Tel: (39-6) 5797 3097/3627, Telex: 625852/3, FAX: (39-6) 5797 6661

International Symposium on Land Reclamation: Advances in Research & Technology, Nashville, Tennessee, USA, December 14-15, 1992.

Information: Dr. William F. Ritter, Chair, Program Committee, Agricultural Engineering Department, University of Delaware, Newark, DE 19717-1303, USA (Tel.: (302) 451-2468; Fax: (302) 292-3651).

1993

ASTM Symposium on Hydraulic Conductivity and Waste Contaminant Transport, San Antonio, Texas, January 21-22, 1993 in conjunction with the January 17-22, 1993 standards development meetings of Committee D-18.

Information: David E. Daniels, University of Texas-Austin, Civil Engineering Dept., Austin, TX 78712-1076 (Tel.: 512/471-4730) or Robert Morgan, ASTM, 1916 Race St., Philadelphia, PA 19103 (Tel.: 215/299-5505).

Ninth Thematic Conference "Geologic Remote Sensing", Pasadena, California, USA, 8 - 11 February, 1993

Information: ERIM/Thematic Conferences, Nancy J. Wallman, P.O. Box 134001, Ann Arbor, MI 48113-4001, USA, Tel: 313-994-1200/3234, FAX: 313-994-5123, Telex: 4940991 erimarb

XVII International Grassland Congress, Palmerston, New Zealand, 8-23 February 1993.

Information: Executive Secretary, XVII Grasslands Congress Organizing Committee, C/ Agronomy Department, Massey University, Palmerston North, New Zealand (Tel.: (06)356-9099; Fax: (06)350-5614).

Climate Change Symposium, XVII International Grassland Congress, Palmerston North, New Zealand, 15 - 16 February, 1993

Information: c/o Agronomy Department, Massey University, Palmerston North, New Zealand, Fax: (64-6) 350 5614

Second Symposium on Biogeochemistry of Wetlands, Baton Rouge, Louisiana, USA, 22 - 24 February, 1993

Information: Mrs. Karen Gros, Wetland Biogeochemistry Institute, Louisiana State University, Baton Rouge, LA 70803, USA

Beyond the Biomass - Compositional and Functional Analysis of Soil Microbial Communities, Kent, UK, 22-24 March 1993.

Information: Dr. Karl Ritz, Soil Plant Dynamics Group, Scottish Crop Research Institute, Invergowrie, Dundee DD2 5DA, U.K. (Tel: 0382-562731; Fax: 0382-562426).

Memorial Symposium J. de Ploey "Experimental Geomorphology and Landscape Ecosystem Changes", Leuven, Belgium, March 22 - 27, 1993.

Information: Memorial symposium J. De Ploey, Laboratory for Experimental Geomorphology, K.U. Leuven, Redingenstraat 16B, B-3000 Leuven, Belgium.

*** International Conference on Pedo-Geomorphic Relationships in the Tropics and Sub-Tropics**, International Society of Soil Science, Commission V (Soil Genesis, Classification and Cartography), South Africa, 16-30 April, 1993.

Information: Mr. T.E. Dohse, Organizing Secretary, P.O. Box 30030, Sunnyside 0132, South Africa (Fax: 0027 12 323 1157).

International Symposium of remote sensing, Enschede, April 19 - 23, 1993.

Information: Prof. J.L. van Genderen, ITC, P.O.Box 6, NL-7500 AA Enschede, Tel.: 053-874 254, FAX: 053-874 436, Telex: 44525 itc nl

2nd International Meeting on Red Mediterranean Soils, organized by the Turkish Society of Soil Science, Turkish Scientific and Technical Research Council, F.A.O. and ISSS, Adana, Turkey, May 3 to May 9, 1993.

Information: Organizing Secretariat, University of Çukurova, Faculty of Agriculture, Department of Soil Science, Adana 01330, Turkey.

Geotechnica, internationale Fachmesse und Kongreß für Geowissenschaften und Geotechnik, Köln, Deutschland, 5. - 8. Mai 1993

Information: Alfred-Wegener-Stiftung zur Förderung der Geowissenschaften, Wissenschaftszentrum, Ahrstraße 45, Postfach 20 14 48, D-5300 Bonn 2, Deutschland Tel.: +(0)228/302-260, Telex: 885 420 wzd, Fax: +(0)228/302-270

International Workshop on Soil Erosion Processes on Steep Lands. Evaluation and Modelling, Merida, Venezuela, May 16 - 20, 1993.

Information: Executive Secretary, CIDIAT-Parque "La Isla" Aptdo. Postal 219, Merida, 5101, VENEZUELA, FAX: 58-74-441461

International Symposium on Hydrological, Chemical and Biological Processes of Transformation and Transport of Contaminants in Aquatic Environments, Rostov-on-Don, USSR, 24-29 May 1993.

Information: Hydrochemistry 1993, Hydrochemical Institute, 198 Stachki pr., Rostov-on-Don 344104, USSR (Tel.: +7 863 22 4470; Telex: 123240 WODA SU).

International Workshop on Sustainable Land Management for the 21st Century, Lethbridge, Alberta, Canada, June 20 - 26, 1993

Information: Ms. Cindy LaValley, Coordinator, International Workshop Organizing Committee, The University of Lethbridge, 4401 University Drive, Lethbridge, Alberta, Canada, T1K 3M4 (Tel: 1-403-329-2244, FAX: 1-403-329-5166)

7th International Symposium on Iron Nutrition and Interactions in Plants, Zaragoza, Spain, 27 June-2 July 1993.

Information: Javier Abadía, Aula Dei Experimental Station, CSIC, Apdo 202, 50080 Zaragoza, Spain (Fax: (+34)-76-575620).

Climate Change and World Food Security (NATO Advanced Research Workshop), Oxford, UK, July, 1993
Information: Dr. M. Parry, University of Oxford, School of Geography, Environmental Change Unit, Oxford, OX1 3TB, UK

Congress of the International Union of Microbiological Societies (IUMS), Prague, Czechoslovakia, July 3 - 8, 1993

Information: B. Sikyata, Institute of Microbiology, Czechoslovak Academy of Science, Videnska 270, 14220 Prague 4, Czechoslovakia

International Workshop 'Groundwater/Surface-Water Ecotones: Biological and Hydrological Interactions and Management Options, Lyon, France, 5 - 9 July 1993
Information: Prof. Janine Gibert, University of Lyon 1, France, Tel: (33) 72 44 82 59, FAX: (33) 72 43 11 41

IAMAP - IAHS '93, Sixth Scientific Assembly of the International Association of Meteorology and Atmospheric Physics and Fourth Scientific Assembly of the International Association of Hydrological Sciences, Yokohama, Japan, July 11-23, 1993.

Information: Local Office of IAMAP-IAHS '93, c/o Sankei Convention, Sankei Bldg. 10F, 1-7-2 Otemachi, Chiyoda-ku, Tokyo 100, Japan (Tel.: (+81)-3-3273-2084; Fax: (+81)-3-3279-6287; Telex: 2228342 SKBJPN).

*** 10th International Clay Conference (ISSS Commission VII)**, Adelaide, Australia, July 18-25, 1993.

Information: R.W. Fitzpatrick, CSIRO, Division of Soils, Private Bag No.2, Glen Osmond, SA 5064, Australia.

International Correlation Meeting on Permafrost Affected Soils, (Classification, Correlation and Management of Permafrost Affected Soils), Alaska, United States, and Yukon and Northwest Territories, Canada, July 18-30, 1993

Information: Dr. John M. Kimble, USDA - Soil Conservation Service, Federal Building, Room 152, 100 Centennial Mall North, Lincoln, NE 68508-3866 USA

4th International Conference on Desert Development, Mexico City, July 25-30, 1993.

Information: Dr. Manuel Anaya Garduño, Executive Secretary Scientific Committee IV ICDD, Colegio de Postgraduados, Montecillo, Edo. de Mexico, 56230, Mexico (Tel.: ++ (52) 696-45701; Fax: ++ (52) 595-45723; P.O. Box 91, Chapingo, 56230 Mexico).

9th World Congress on Protozoology, Berlin, Germany, July 25 - Aug. 1, 1993

Information: H. Mehlhorn, Ruhr Univ. Bochum, Postfach 102148, D-4630 Bochum, Germany

4th International Symposium "Windbreaks and Agroforestry", Viborg, Denmark, July 26 - 30, 1993
Information: 4th International Symposium, Hedeselskabet, P.O.Box 110, DK-8800 Viborg, Denmark

*** International Workshop on Classification and Management of Desert Soils**, Wulumuqi, China, August 8-20, 1993.

Information: Dr. Gong Zitong, Institute of Soil Science, Academia Sinica, P.O. Box 821, Nanjing 210008, PR of China (Fax: +86 25-712663; Telex: 34025 issas cn).

Precision Nutrient Management: An International Symposium on Soil and Plant Analysis, Olympia, Washington, USA, August 14 - 20, 1993

Information: J. Benton Jones, Jr., Council on Soil Testing and Plant Analysis, Georgia University Station, P.O.Box 2007, Athens, GA 30612-0007, USA, Tel.: (404)546-0425, FAX (404)548-4891, or Yash P. Kalra, Forestry Canada, 5320 - 122 Street, Edmonton, Alberta, Canada T6H 3S5, Tel.: (403)435-7210, FAX: (403)435-7359

6th International Ecological Congress, Manchester, U.K., August 21 - 26, 1993

Information: R. Sharitz, INTECOL, Savannah River Ecology Lab., Univ. of Georgia, Aiken, SC 29802, USA

24th International Horticultural Congress, Kyoto, Japan, August 21 - 27, 1993

Information: Japanese Society for Horticultural Science, Fac. of Agriculture, Kyoto University, Sakyo, Kyoto 606, Japan

Anniversary Conference of the Wageningen Agricultural University: "The Future of the Land: Mobilizing and Integrating Knowledge for Land Use Options", Wageningen, The Netherlands, August 22 - 25, 1993.

Information: Secretary of the Programme Committee, Prof. Dr. L. Stroosnijder, Dept. Irrigation and Soil and Water Conservation, Nieuwe kanaal 11, 6709 PA Wageningen, The Netherlands (Tel.: +31 8370 82446; Fax: +31 8370 84759).

3rd International Conference on Geomorphology, Hamilton, Canada, August 23-29, 1993.

Information: 3rd International Conference on Geomorphology, McMaster University, Hamilton, Ontario, Canada L8S 4K1 (Fax: +1 416 546-0463; Telex: 061 8347).

15th International Botanical Congress, Tokyo, Japan, Aug. 28 - Sept. 3, 1993

Information: M. Furuya, Frontier Research Programs, The RIKEN Institute, Wako City, 351-01, Japan

15th Congress and Exhibition "Water Management in the next Century", The Hague, The Netherlands, 30 August-12 September 1993.

Information: Netherlands National Committee ICID, Attn: Bart Schultz, P.O. Box 600, 8200 AP Lelystad, The Netherlands (Tel.: +31 3200 97440; Fax: +31 3200 34300; Telex: 40115 flevo nl).

Second International Conference on the Biogeochemistry of Trace Elements, Taipei, Taiwan, Republic of China, September 5-10, 1993.

Information: Dr. Shang-Shyng Yang, Dept. of Agricultural Chemistry, National Taiwan University, Taipei, Taiwan, 106, R.O.C. (Tel.: 886-2-3621519; Fax: 886-2-3633123).

International Conference on Nuclear Waste Management and Environmental Remediation, Prague, Czechoslovakia, 5 - 11 September, 1993

Information: Mr. Radovan Kohout, Ontario Hydro (H11 A20), 700 University Avenue, Toronto, Ontario, Canada M5G 1X6, Tel: 416/592-5384, FAX 416/592-4485

International Conference on Groundwater Quality Management, Tallin, Estonia, 6-9 September 1993.

Information: GQM 93, c/o Institute of Ecology and Marine Research, Paldiski Road 1, 200 001 Tallinn, Estonia (Tel.: +7 (0142) 451634; Fax: +7 (0142) 453748).

International Symposium on the Structure of the Soil Cover, Pushchino, Russia, September 6 - 11, 1993

Information: Organizing Committee on SCS, V.V. Dokuchaev Soil Institute, Pygevsky per. 7., 109017 Moscow, Russia.

3rd International Symposium on Plant-Soil Interactions at Low pH, Brisbane, Queensland, Australia, 12-16 September, 1993.

Information: Low pH Symposium, Australian Convention and Travel Services Pty Ltd, GPO Box 2200, Canberra A.C.T. 2601 Australia (Tel.: +61-6-2573299; Fax: +61-6-2573256).

*** 12th International Plant Nutrition Colloquium**, Perth, Australia, September 21-26, 1993.

Information: Plant Nutrition Secretariat, The Conference Office, The University of Western Australia, Nedlands WA 6009, Australia (Fax: +61 9-382-2029).

XII Congreso Latinoamericano de la Ciencia del Suelo, Salamanca, España, 23 al 26 setiembre 1993.

Information: I.E.T. / CSIC, Apartado 257, 37071 Salamanca, España (Fax: (9) 23-219609).

*** Managing Red and Lateritic Soils for Sustainable Agriculture**, Bangalore, India, 24 - 28 September, 1993

Information: Prof. J. Sehgal, National Bureau of Soil Survey and Land Use Planning, Amravati Road, P.Box 426, Nagpur-440 010 (Maharashtra) India.

XI International Symposium on Environmental Biogeochemistry, Salamanca, España, 27 al 30 setiembre 1993.

Information: I.E.T. / CSIC, Apartado 257, 37071 Salamanca, España (Fax: (9) 23-219609).

IUFRO S1.02.06 Technical Meeting on "Site Classification and Evaluation", Clermont-Ferrand, France, October 19-22, 1993.

Information: Alain Franc, CEMAGREF, Division Techniques Forestières, Domaine de Lалуas, F-63 200 RIOM, France (Tel.: (33) 73382052; Fax: (33) 73387641).

1994

ASTM Symposium "Dynamic Geotechnical Testing II", Reno, Nevada, January 27 - 28, 1994

Information: Ronald J. Ebelhar, Westinghouse Environmental and Geotechnical Services, Inc., 11785 Highway Dr., Suite 100, Cincinnati, OH 45241, Tel: 513/733-9374, Fax: 513/733-8213, or Dr. Vincent P. Drnevich, Purdue University, 1284 Civil Engineering Bldg., West Lafayette, IN 47907, Tel: 317/494-2159 Fax: 317/494-0395 or Bruce L. Kutter, University of California, Dept. of Civil Engineering, Davis, CA 95616, Tel: 916/752-8099, Fax: 916/752-8924

XV. International Congress of Soil Science (ICSS), Acapulco, Mexico, July 10 - 16, 1994.

Information: XVICSS Secretariat, Centro de Edafología, Colegio de Postgraduados, P.O. Box 45, 56230 Chapingo, México, FAX +52-595-45723

13. ISTRO Conference Soil Tillage for Crop Production and Protection of Environment, Aalborg, Denmark, July 24-July 29 1994.

Information: ISTRO Conference 1994, Aalborg Convention Bureau, Osteraa 8, DK-9000 Aalborg, Denmark (Tel.: +45 98 12 63 55; Fax: +45 98 16 69 22).

INTECOL Ecological Progress to meet the Challenge of Environmental Change, Manchester, England, August 20 - 26, 1994

Information: The Secretary, VI International Congress of Ecology, Department of Environmental Biology, The University, Manchester, M13 9PL, U.K.

IGU Regional Conference on Environment and Quality of Life in Central Europe, Prague, Czechoslovakia, 22-26 August 1994.

Information: Dr. L.A. Kosinski, Secretary General IGU, Dept. of Geography, University of Alberta, Edmonton, Alberta, Canada T6G 244.

16th General Meeting of the International Mineralogical Association (IMA), Pisa, Italy, 3 - 8 September 1994.

Information: Stefano Merlino, organizing committee IMA '94, Dipartimento di Scienze della Terra, Università di Pisa, Via S.Maria 53, I-56126 Pisa, Italy; FAX: 39-(0)50-40976 E-mail: IMA94@ICNUCEVM

1995

1996

28th International Geographical Congress, The Hague, The Netherlands, 4-10 August 1996.

**INTERNATIONAL TRAINING COURSES
COURS INTERNATIONAUX DE FORMATION
INTERNATIONALE FORTBILDUNGSKURSE**

Course on Waterlogging and Salinity Technical Study Tour of U.S. Western States, Logan, Utah; Grand Junction, Colorado; Yuma, Arizona; Imperial Valley of California, USA, April 8-May 2, 1992 and April 7-May 1, 1993.

Information: International Irrigation Center, Utah State University, Logan, Utah 84322-4150, U.S.A. (Tel.: (801) 750-2800; Fax: (801) 750-1248; Telex: 3789426 UTAHSTATE LOGN).

Socio-Economic Aspects of Agricultural Mechanization, April 21 - June 5, 1992 and Sowing and Planting, Distribution of Fertilizers, Crop Protection, July 6 - September 11, 1992 and **Harvest and Post-Harvest Process**, July 6 - September 18, 1992, Kempen, Germany

Information: H. Diedrich, Course Coordinator, DEULA-Lehranstalt, German Training Centre for Agricultural Engineering, Krefelder Weg 41, D-4152 Kempen, Germany

International Course on On-Farm Irrigation Design, Evaluation and Scheduling, Logan, Utah, USA, May 3-June 13, 1992 and May 2-June 12, 1993.

Information: International Irrigation Center, Utah State University, Logan, Utah 84322-4150, U.S.A. (Tel.: (801) 750-2800; Fax: (801) 750-1248; Telex: 3789426 UTAHSTATE LOGN).

International Training Course on Agroforestry Research for Development: Concepts, Technologies, Practices and Methods, Nairobi, Kenya, 4-22 May 1992.

Information: ICRAF/DSO Course Coordinator, P.O.Box 30677, Nairobi, Kenya (Tel.: 254-2-521450; Fax: 521001; Telex: 22048).

International Postgraduate Course "Soil Pollution and Soil Protection", Gent, Belgium, 11-16 May 1992.

Information: International Training Centre (PHLO), Wageningen Agricultural University, P.O.Box 8130, 6700 EW Wageningen, The Netherlands (Tel.: 31-8370-84092/3; Fax: 31-8370-84763).

FAO/IAEA Interregional Training Course on "The Use of Isotope and Radiation Techniques to Enhance Biological Nitrogen Fixation", Seibersdorf and Vienna, Austria, 1 June-3 July 1992.

Information: Head, Soil Fertility, Irrigation and Crop Production Section, Joint FAO/IAEA Division of Nuclear Techniques in Food and Agriculture, P.O.Box 100, Wagramerstrasse 5, A-1400 Vienna, Austria.

Workshop on Implementing National Irrigation Programs, Logan, Utah; San Joaquin and Sacramento Valleys of California, USA, June 7-24, 1992.

Information: International Irrigation Center, Utah State University, Logan, Utah 84322-4150, U.S.A. (Tel.: (801) 750-2800; Fax: (801) 750-1248; Telex: 3789426 UTAHSTATE LOGN).

Course on On-Farm Water Management, Logan and Delta, Utah and Grand Junction, Colorado, USA, June 28-August 8, 1992 and June 27-August 7, 1993.

Information: International Irrigation Center, Utah State University, Logan, Utah 84322-4150, U.S.A. (Tel.: (801) 750-2800; Fax: (801) 750-1248; Telex: 3789426 UTAHSTATE LOGN).

Training for Environment and Resources Planning

- Land resource survey and planning course

- Environmental management course for development planning
- Course for women in the environmental process,

and:

Training Course in Rural Development

- Management and extension course
- Management course for women in rural development
- Training of trainers course
- Media producers course

Brighton, U.K., July 13 - September 26, 1992 Information: David Hearle, Course Director, Ian MacDonald Associates Ltd. 36 Robertson Road, Brighton, East Sussex, BN1 5NL, U.K.

Short Courses on:

Applied Ecology, 23.06.1992

Senior Advanced Course on Appropriate Modernization and Management of Irrigation Systems, Sept. 1992;

Senior Advanced Course on Lowland Development, Sept. 15-Oct. 2, 1992;

Seminar on Coastal Zone Management, 08.09.1992;

Applied Modelling of Ground Water Pollution, Oct. 1992;

Applied Modelling of Ground Water Chemistry, Nov. 1992; at the International Institute for Hydraulic and Environmental Engineering (IHE), Delft, the Netherlands.

Information: International Institute for Hydraulic and Environmental Engineering, Oude Delft 95, P.O. Box 3015, 2601 DA Delft, The Netherlands (Tel.: +31-15-78 80 21; Fax: +31-15-12 29 21; Telex: 38099 ihe nl).

Forthcoming Course on "Environmental Management in Developing Countries", Norwich, UK, July-September 1992.

Information: Overseas Development Group, The Course Director, University of East Anglia, Norwich NR4 7TJ, UK (Tel.: (0603) 57880; Fax: (0603) 505262; Telex: 975197 UEACPC G for ODG).

Agricultural and Rural Technology Research and Development; Arid Lands and Pastoral Development, Norwich, UK, 13th July to 4th September 1992.

Information: The Course Coordinator, Overseas Development Group, University of East Anglia, Norwich NR4 7TJ, UK (Tel.: (0603) 57880; Fax: (0603) 505262; Telex: 975197 UEA CPC G for ODG).

Irrigation Water Management Study Tour of U.S. Western States, Utah, Colorado; Arizona and California, USA, August 9-29, 1992 and August 8-28, 1993.

Information: International Irrigation Center, Utah State University, Logan, Utah 84322-4150, U.S.A. (Tel.: (801) 750-2800; Fax: (801) 750-1248; Telex: 3789426 UTAHSTATE LOGN).

International Course on Soil and Water Conservation and Management, Logan, Utah, USA, August 16-September 19, 1992. and **Soil Conservation and Management Study Tour of U.S. Midwestern States, Sept. 2 - 19, 1992.**

Information: International Irrigation Center, Utah State University, Logan, Utah 84322-4150, U.S.A. (Tel.: (801) 750-2800; Fax: (801) 750-1248; Telex: 3789426 UTAHSTATE LOGN).

International Course on Land Drainage, ILRI, Wageningen, The Netherlands, 17 August-27 November 1992.

Information: The Director, IAC, P.O. Box 88, 6700 AB Wageningen, The Netherlands.

Tropical Trees: Potential for Domestication, Edinburgh, Scotland, 24 - 28 August, 1992 Information: ECTF Conference Secretariat, Institute of Terrestrial Ecology, Bush Estate, Penicuik, Midlothian EH26 0QB, Scotland, U.K.

Workshop on Information Management for Natural Resources Development, Enschede, The Netherlands, September 8 - October 2, 1992
Information: ITC Student Registration Office, P.O.Box 6, NL-7500 AA Enschede

Short Course on Soil Science for Alumni from South-East Asia, Gadjah Mada University, Yogyakarta, Indonesia, August 2-12, 1993.
Information: Prof.Dr. G. Stoops, ITC-Ghent, Krijgslaan 281/S8, B-9000 Gent, Belgium (Fax: 32-91-644997).

International Post Graduate Course on Land Drainage, Wageningen, The Netherlands, August 16 - November 26, 1993
Information: International Agricultural Centre (IAC), P.O. Box 88, NL-6700 AB Wageningen, The Netherlands, Tel.: 08370-90111, Telex: 45888 intas nl, Fax: 08370-18552

Courses of the International Institute for Hydraulic and Environmental Engineering, Courses in: Hydraulic Engineering, Hydrology, Sanitary Engineering, Environmental Science & Technology, Water Quality Management, Advanced Environmental Sanitation, Transportation & Road Engineering in Development;
M.Sc. and Ph.D. Programme and a wide range of other courses available on demand, Delft, The Netherlands, October 1992 (duration: between 11 and 23 months)
Information: The Registrar of IHE, P.O. Box 3015, NL-2601 DA Delft, The Netherlands
Tel: +31 15/78 34 04, cable: interwater, Telex: 38099 ihe nl, FAX: +31 15 12 29 21

Second International Intensive Course on Soil Micromorphology, Wageningen Agricultural University, The Netherlands, October 5-October 30, 1992.
Information: Wageningen Agricultural University, Department of Soil science and Geology, P.O. Box 37, 6700 AA Wageningen, The Netherlands (Fax: +31 8370 82419).

Training Course on Agroforestry Research for Development, Nairobi, Kenya, 12 - 30 October, 1992
Participants must have M.Sc. or B.Sc.
Information: Course Coordinator, ICRAF Training Programme International Centre for Research in Agroforestry P.O. Box 30677, Nairobi, Kenya, Tel: 521450, Telex: 22048, FAX: (254-2)521001, E-Mail: CGI236, Cable: ICRAF

Course on Environmental Biotechnology, Luzern, Switzerland, 10 - 13 November, 1992
Information: EERO Training Centre, P.O. Box 182, NL-6700 AD Wageningen, The Netherlands, Tel. +31-8370-84924, Fax: +31-8370-84941

Training Course on Experimental Design and Analysis for Agroforestry Research, Nairobi, Kenya, Participants must have M.Sc. or equivalent 23 November - 12 December, 1992
Information: Course Coordinator, ICRAF Training Programme International Centre for Research in Agroforestry
P.O. Box 30677, Nairobi, Kenya, Tel: 521450, Telex: 22048, FAX: (254-2)521001, E-Mail: CGI236, Cable: ICRAF

Course on Environmental Chemistry of Organic Pollutants, Siena, Italy, 6 - 9 December, 1992
Information: EERO Training Centre,
P.O. Box 182, NL-6700 AD Wageningen, The Netherlands, Tel. +31-8370-84924, Fax: +31-8370-84941

International Course for development oriented Research in Agriculture, International Agricultural Centre, Wageningen, The Netherlands, January 11 - July 29, 1993

Information: The Director of ICRA, P.O. Box 88, NL-6700 AB Wageningen, The Netherlands

Cours International pour la Recherche Agricole orientée vers le Développement, Complexe International de Recherche et d'Enseignement Supérieur, Agropolis, Montpellier, France, 2 avril - 28 octobre 1993.

Information: Monsieur le Directeur de l'ICRA, BP 88, NL-6700 AB Wageningen, Pays Bas

Cursos de Magister en Ciencias Agrícolas (Suelos y Producción Vegetal) y Doctorado en Agronomía de aproximadamente 2 y 4 años de duración en la Universidad Nacional del Sur (UNS) Bahía Blanca, Argentina. Idioma: Español. Frecuencia: permanente.

Informes: Prof. Dr. R.A. Rosell, Agronomía, UNS, 8000 BAHIA BLANCA, ARGENTINA (Tel.: 54-91-30024/26533; Fax: 54-91-27876; Telex: 81712 DUJOR AR).

ICRAF Training Materials for Agroforestry, Nairobi, Kenya.

Information: International Council for Research in Agroforestry, P.O.Box 30677, Nairobi, Kenya (Tel.: 254-2-521450; Fax: 521001; Telex: 22048).

External Programme, specialised courses on Managing Agricultural Development, Environmental Management in Agricultural Development, Kent, UK.

Information: The External Programme, Wye College, University of London, Ashford, Kent TN25 5AH UK (Tel.: 0233 812401; Fax: 0233 813320; Telex: 94017832 WYEGG).

Courses in Soil Conservation, Adelaide, Australia.

Information: The Chairman, Department of Soil Science, Waite Agricultural Research Institute, P.M.B. 1, Glen Osmond 5064, South Australia (Tel.: 08 372 2210; Fax: 08 338 1757; Telex: UNIVAD AA 89141).

2-Year Master Programme and 1-Year Diploma Programme in Irrigation Engineering.

Information: Center for Irrigation Engineering, Programme coordinator, K.U.Leuven, Kardinaal Mercierlaan 92, 3001 Leuven (Heverlee), Belgium.

M.Sc. Programmes at the Department of Agricultural Engineering, University of Nairobi, Kenya, 1991/1993.

Information: University of Nairobi, Dept. of Agricultural Engineering, P.O. Box 30197, Nairobi, Kenya.

MSC Programme in Survey Integration for Resources Development

- Land Use Planning and Resources Management or
- Project Planning and Implementation or
- Rural Energy and Development

International Institute for Aerospace Survey and Earth Sciences, Enschede, The Netherlands

Information: ITC Student Registration Office, P.O. Box 6, NL-7500 AA Enschede, The Netherlands Tel: 053 874 444, FAX: 053 874 400, Telex: 44525 itc nl

Postgraduate Diploma Courses, M.Sc. and Ph.D. Programmes, Hydraulic Engineering, Hydrology, Sanitary Engineering, Water Quality Management, Environmental Science and Technology, Delft, The Netherlands, 1991-1992.

Information: International Institute for Hydraulic and Environmental Engineering, Oude Delft 95, P.O. Box 3015, 2601 DA Delft, The Netherlands (Tel.: +31-15-78 80 21; Fax: +31-15-12 29 21; Telex: 38099 ihe nl).

Master of Science in Eremology (Interdisciplinary, 2-Year, Post-Graduate Programme in Desert Science), Ghent, Belgium, starting each year in October.

Information: The Secretary of Eremology, Dr.ir. R. Hartmann, Faculty of Agricultural Sciences, State University of Ghent, Coupure Links 653, B-9000 Gent, Belgium.

Post-Graduate Diploma Course in Forestry for Rural Development, Enschede, The Netherlands.

Information: The International Institute for Aerospace Survey and Earth Sciences (ITC), 350 Boulevard 1945, P.O. Box 6, 7500 AA Enschede, The Netherlands (Tel.: (31) 53 874 444; Fax: (31) 53 874 400; Telex 44525 ITC NL).

Post-Graduate Diploma and M.Sc. Degree Courses in: Soil Survey; Forest Survey; Rural and Land Ecology Survey; Survey Integration for Resources Development, Enschede, The Netherlands.

Information: The International Institute for Aerospace Survey and Earth Sciences (ITC), 350 Boulevard 1945, P.O. Box 6, 7500 AA Enschede, The Netherlands (Tel.: (31) 53 874 444; Fax: (31) 53 874 400; Telex 44525 ITC NL).

M.Sc. Courses in "Irrigation Engineering" and "Soil Conservation and Land Reclamation".

Information: Information: The Course Administrator, Effective Irrigation Management Short Course, Institute of Irrigation Studies, The University, Southampton SO9 5NH, UK (Tel.: (0703) 593728; Fax: (0703) 593017; Telex: 47661 (a/b sotonu g).

Course in "Soil Science, Plant Nutrition and Fodder Crops", Technical College of Tropical Agriculture Basel.

Information: Swiss Tropical Institute, Socinstrasse 57, 4051 Basel, Switzerland (Tel.: (061) 23 38 96); Technikum für tropische Landwirtschaft, Andreas Heusler-Strasse 41, 4052 Basel, Switzerland (Tel.: (061) 50 80 10).

Graduate Study and Training in Development, School of Development Studies, Norwich, UK.

Information: Senior Administration Assistant, School of Development Studies, University of East Anglia, Norwich, NR4 7TJ, U.K. (Tel.: (0603) 56161; Fax: (0603) 58553; Telex: 995801 GLOTLX-G).

Irrigation Engineering Principles, a videotape course, Logan, Utah, USA.

Information: Utah State University Foundation, Logan, Utah, 84322-9300, U.S.A. (Tel.: (801) 750-2603; Fax: (801) 750-1248; Telex: 3789426 UTAHSTATEU).

Applied Hydraulics, a videotape course and textbook, Logan, Utah, USA.

Information: Utah State University Foundation, Logan, Utah, 84322-9300, U.S.A. (Tel.: (801) 750-2603; Fax: (801) 750-1248; Telex: 3789426 UTAHSTATEU).

Soil and Water Management Research and Training, African Academy of Sciences, Nairobi, Kenya.

Information: Head of Programmes, African Academy of Sciences, P.O. Box 14798, Nairobi, Kenya (Tel.: 802182/3, 802176; Fax: (02) 802185; Telex: 25446 AFACS KE).

M.Sc. Course in Soil Science and Water Management, Wageningen, The Netherlands.

Information: Director of Studies of MSc-Courses, P.O. Box 453, 6700 AL Wageningen, the Netherlands.

MSc Programmes: Agricultural Engineering, Animal Science and Aquaculture, Biotechnology, Crop Science, Ecological Agriculture, Geographic Information Systems,

Management of Agricultural Knowledge Systems, Soil and Water, Tropical Forestry, Wageningen, The Netherlands.

Information: Wageningen Agricultural University, Dean's Office for Foreign Students, P.O. Box 453, 6700 AL Wageningen, The Netherlands (Tel.: (08370)82680; Fax: (08370)84464; Telex: 45854 LUWAG).

Post-graduate Training Course in Soil Science, Agricultural University, Aas, Norway.

Information: Dr. B.R. Singh, Coordinator International Post-graduate Program in Soil Science, Box 28, 1432 Aas-NLH, Norway.

International Post-Graduate Course in Soil Science, Ghent, Belgium.

Information: The International Training Centre for Post-Graduate Soil Scientists, State University of Ghent, Krijgslaan 281, B-9000 Ghent, Belgium.

Cours de 3e cycle en Protection de l'Environnement, EPFL, Lausanne, Suisse.

Information: Prof. L.Y. Maystre, Inst. de génie de l'environnement, EPFL-Ecublens, CH-1015 Lausanne, Suisse (tél: (21) 693.27.15).

Sponsored Training Courses on Use of Isotope Techniques in Soil Research and Plant Nutrition, International Atomic Energy Agency, Seibersdorf, Austria.

Information: IAEA Headquarters, Joint FAO/IAEA Division, Vienna International Center, Wagramerstr. 5, P.O. Box 100, A-1400 Vienna, Austria.

M.Sc. in Conservation of Soil Fertility, Canterbury, England.

Information: Dr. R.G. Burns, Biological Laboratory, University of Kent, Canterbury, Kent CT2 7NJ, U.K.

M.Sc. and Post-graduate Diploma courses in : Agricultural Engineering, Land and Water Management, Rural Engineering, Applied Remote Sensing, Rural Land Use, Agricultural Water Management, Silsoe College, Cranfield Institute of Technology, England.

Information: The Student Recruitment Executive Silsoe College, Silsoe, Bedford MK45 4DT, UK (Tel.: (0525)60428; Fax: (0525)61527).

Post-graduate Training Courses in Soil Science and Plant Biology, Granada/ Sevilla, Spain.

Information: Dr. M.L. Garrido, Estacion Experimental del Zaidin, Avenida de Cervantes, Apdo. 419, Granada, Spain.

Interuniversity Post-graduate Programme in Hydrology, Free University of Brussels, Belgium.

Information: Prof.Dr.Ir. A. van der Beken, Director of the Hydrology Programme, Laboratory of Hydrology, Vrije Universiteit Brussel, Pleinlaan 2, B-1050 Brussels, Belgium.

Farming Systems Approaches to Upland Conservation and Watershed Management in the Tropics, University of Hawaii.

Information: S.A. El-Swaify, Chairman, Dept. of Agronomy and Soil Science, College of Tropical Agriculture and Human Resources, University of Hawaii, Honolulu, Hawaii 96822.

Programme for Ph.D. in Environmental Chemistry and Technology, Lublin, Poland.

Information: Prof. Lucjan Pawlowski, Dept. of Water and Wastewater Technology, the Technical University of Lublin, 40 Nadbystrzycka Str., 20-618 Lublin, Poland.

Advances in Biological Nitrogen Fixation, Puerto Rico, USA.

Information: Dr. E.C. Schroder, Dept. of Agronomy and Soils, College of Agricultural Sciences, University of Puerto Rico, Mayaguez, Puerto Rico 00709-5000, USA.

Post-graduate Courses in Soil Science, Univ. of Reading, Dept. of Soil Science, U.K.
Information: The Secretary, Department of Soil Science, University of Reading, London Road, Reading RG1 5AQ, England.

Post-graduate Course in Soil Science, Maracay, Venezuela.
Information: Universidad Central de Venezuela, Facultad de Agronomía, Comisión de Estudios de Postgrado, Curso de Postgrado en Ciencia del Suelo, Avda. Principal el Limón, Apartado Postal 4579, Maracay, Estado Aragua, Venezuela, S.A.

International Post-graduate Training Course in Eremology, (Desert Science), Ghent, Belgium.
Information: The International Center for Eremology, University of Ghent, Coupure Links 653, B-9000 Ghent, Belgium (Tel.: ++32-91-646036; Fax: ++32-91-646247).

M.Sc. Course in Resource Assessment for Development Planning, University of East Anglia, Norwich, England.
Information: Dr. David Dent, School of Environmental Sciences, University of East Anglia, Norwich NR4 7TJ, England.

Cursos de Postgrado en Desarrollo de los Recursos de Aguas y Tierras, Merida, Venezuela.
Information: CIDIAT, Apartado 219, Merida, Venezuela.

Training Course in Soil and Plant Analysis, at the Royal Tropical Institute, Amsterdam, The Netherlands.
Information: The Course Coordinator, Soil and Plant Analysis, Royal Tropical Institute (KIT), 63 Mauritskade, 1092 AD Amsterdam, The Netherlands.

Centro Internacional de Altos Estudios Agronomicos Mediterraneo, Zaragoza, Spain.
Curso superior de diez meses sobre Ordenación Rural en función del Medio Ambiente.
Información: Instituto Agronómico Mediterráneo de Zaragoza, Apartado 202, 50080 Zaragoza, España.

Cours de Formation Spécialisée sur les Aménagements de Terrain, Le Havre, France.
Information: ISTOM, CHCI Quai George V, 76600 Le Havre, France.

International Course on Soil Reference Collections, ISRIC, Wageningen, The Netherlands.
Information: the Director, ISRIC, P.O. Box 353, 6700 AJ Wageningen, The Netherlands.

College of Soil Physics, Trieste, Italy.
Information: International Centre for Theoretical Physics, College on Soil Physics, P.O. Box 586, I-34100 Trieste, Italy.

International Fertilizer Development Center, USA.
Information: International Fertilizer Development Centre, P.O. Box 2040, Muscle Shoals, Alabama 35662, USA.

Courses in Agricultural and Rural Development by the USDA and US Universities.
Information: Ralph Otto, Acting Director, International Training Division, USDA/OICD, Washington, D.C. 20250-4300, U.S.A.

Courses in Project Planning and Management, Bradford, England.
Information: The Director, Development and Project Planning Centre, University of Bradford, Bradford, West Yorkshire BD7 1DP, England.

Courses in Soil and Plant Analysis, University of Reading, England.

Information: Dr. A.A. Jones, Department of Soil Science, University of Reading, London Road, Reading, RG1 5AG, England.

Arid Lands Resource Sciences Ph.D. Program, The University of Arizona, Tucson, Arizona.

Information: Graduate College, University of Arizona, Tucson, Arizona 85721, USA (Tel.: (602)621-3132; Fax: (602)621-7112).

NEW PUBLICATIONS
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Titles of new publications are listed here for information. Orders can not be handled by the ISSS Secretariat but should be placed through a bookstore or directly with the publishers. Nearly all publications mentioned can however be viewed at the office of the Deputy Secretary-General of the Society, the International Soil Reference and Information Centre (ISRIC) in Wageningen, the Netherlands.

Les titres de nouvelles publications sont mentionnés à titre d'information. Veuillez adresser vos commandes non pas au Secrétariat de l'AISS, mais à une librairie ou directement aux éditeurs. Presque toutes les publications mentionnées peuvent être consultées au bureau du Secrétaire-Général Adjoint de l'AISS, Centre International de Référence et d'Information Pédologique (ISRIC) à Wageningen, Pays-Bas.

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Acidic Deposition. Its Nature and Impact. F.T. Last and R. Watling, editors. The Royal Society of Edinburgh, Edinburgh, 1991, xxiv + 344p. ISBN 0-902198-07-6. Paperback.

This volume records the thirteen invited lectures at an international conference held in Glasgow in September 1990. The refereed contributions to many of the concurrent sessions will be published in special volumes of the journals *Environmental Pollution; Agriculture, Ecosystems and Environment* (e.g. on acidification of soils); *Forest Ecology and Management*; and *Atmospheric Environment (Urban Atmosphere)*. The present publication has soil contributions related to forests and on reversibility of acidification in soils and surface waters.

Price: in UK: £ 42. Elsewhere: US\$ 84, including post and packing.

Orders to: The Royal Society of Edinburgh, 22, 24 George Street, Edinburgh EH2 2PQ, U.K.

Erosion, Transport and Deposition Processes. IAHS Publication No. 189. D.E. Walling, A. Yair and S. Berkowicz, editors. IAHS, Wallingford, 1990, vii + 203p. ISBN 0-947571-37-X. Paperback.

The 13 papers presented in this volume represent one outcome of an International Workshop on Erosion, Transport and Deposition Processes with Particular Reference to Semi-arid and Arid Areas, held in Jerusalem in 1987.

Semi-arid and arid terrains provide the field scientists with a mixed bag of advantages and disadvantages for research. Difficult logistics and an often short and erratic database are balanced by the relative simplicity of physiographic structure and minimal interference from antecedent events. Although considerable progress has been accomplished in recent years, as, for example demonstrated during the field excursions of the Workshop, the study of many important aspects of erosion processes in deserts is still in its infancy. Much more needs to be done in order to form a coherent and generalized body of knowledge applicable to severe

environmental problems associated with erosion and sedimentation in arid areas, especially in developing countries.

Price: US\$ 40

Orders to: IAHS Press, Institute of Hydrology, Wallingford, Oxfordshire OX10 8BB, U.K. or: Office of the Treasurer IAHS, 2000 Florida Avenue NW, Washington, DC 20009, U.S.A.

Conserving the World's Biological Diversity. J.A. McNeely, K.R. Miller, W.V. Reid, R.A. Mittermeier and T.B. Werner. International Union for Conservation of Nature and Natural Resources, World Resources Institute, Conservation International, World Wildlife Funds-US and the World Bank, 1990, 193p. ISBN 0-915825-42-2, 0-8213-1384-3 (the World Bank). Paperback.

This is a guide to all who would like to turn the tide of destruction into a new, positive relationship between people and nature. A new form of civilization based on the sustainable use of renewable resources is not only possible, but essential. This book suggests the principles and tools that are available to promote the new civilization, based on community self-reliance, diversity in both nature and human cultures, economic systems that consider all costs and benefits of alternative actions, scientific research that is applied to the challenges of managing natural resources, and the use of modern information technology to ensure that decisions are based on full knowledge of the likely consequences.

Most of the major policy decisions that affect the use of natural resources are taken in the cities, far removed from the realities of the limitations imposed by nature's productivity. Policies on trade, international cooperation, land tenure, defense, agriculture, forestry, fisheries, education, health, and finance all affect the way biological resources are used or abused. This book can help ensure that urban decision-makers do not forget that the wellspring of human prosperity is in the countryside, and that new policies are required to ensure a continuing flow of benefits from biological resources to all of humanity.

Orders to: IUCN Publications Services, 1196 Gland, Switzerland; or: WRI Publications, P.O. Box 4852 Hamden Station, Baltimore, MD 21211, U.S.A.; or: World Bank Publications, P.O. Box 7247-8619, Philadelphia, PA 19170-8619, U.S.A.

New Publications of FAO

Guidelines for Land Use Planning. Revised draft. Interdepartmental Working Group on Land Use Planning. FAO, Rome, 1992, viii + 140p.

The demands for arable land, grazing, forestry, wildlife, tourism and urban development are greater than the land resources available. In the developing countries, these demands are ever more pressing because the population dependent on the land will double within the next 30 to 50 years. Even where land is still plentiful, many people may have inadequate access to land or benefits from its use. In the face of scarcity, the spoiling of farmland, forest or water resources may be clear for all to see but individual land users may lack the resources or incentive to stop it.

Land use planning is a systematic way of addressing these problems. Its focus is the evaluation of land and the options for land use; its purpose to select those combinations of land and land use that will best achieve our goals.

This volume is primarily for people who are beginning rural land use planning in local government, national agencies and international projects in developing countries. It also provides an overview of land use planning for administrators and decision-makers. In these Guidelines, the technical role of the planner and the role of the decision-maker are treated as distinct. Planning provides information and support for decision-making.

Water and Sustainable Agricultural Development. FAO, Rome, 1990, 42p.

This document presents an International Programme on Water and Sustainable Agricultural Development (IAP-WASAD) for the 1990s. Its objective is primarily to assist member countries of the United Nations System in planning, developing and managing water resources on an integrated basis in order to meet the present and future needs for agricultural production on a sustainable basis, bearing in mind competing demands for limited water resources.

The Conservation and Rehabilitation of African Lands. An international scheme. FAO, Rome, 1990, 38p.
ARC/90/4.

The purpose of the International Scheme for the Conservation and Rehabilitation of African Lands is to provide a means by which African countries can develop their own programmes to fight land degradation. The Scheme is specifically designed to enable countries to tailor these programmes to meet their individual needs.

Currently, African nations face severe financial constraints and lack enough trained workers and inputs to undertake programmes of the scale required. Fortunately, technical assistance and financing agencies are keen to help -providing they can do so within programmes likely to enjoy long-term success. This Scheme therefore includes a mechanism which enables African governments and these organizations to work in partnership.

Orders to: FAO sales agents, or: Distribution and Sales Section, FAO, Via delle Terme di Caracalla, 00100 Rome, Italy.

Water Erosion. K. Ivanov and D. Pechinov, editors. Unesco, Paris, 1989, 142p.

Within the framework of the Unesco programmes IHP and MAB, an international symposium on water erosion was held in Bulgaria in September 1988. This volume can be considered as an abridged version of the proceedings containing the key papers as well as a state-of-the art paper summarizing the discussions.

Requests to: see below.

Training Guidance for the Integrated Environmental Evaluation of Water Resources Development Projects. H.C.

Torno. Unesco, Paris, 1988, viii + 150p.

The water resources programme of Unesco is centred around the International Hydrological Programme (IHP). Within IHP the influence of man on the hydrological cycle has been a priority area since the start of the International Hydrological Decade in 1965. This area covers scientific studies of the influence of man on the hydrological cycle, including water quantity and quality. The activities of man are considered to include direct action, such as land use changes, consumptive use of water, physical operations on river systems, and addition of contaminants of various kinds, as well as those of a more indirect nature such as, for example, man-induced climatic changes. *These studies also include the effects of changes in the hydrological cycle on social, environmental and ecological aspects relative to water resources.*

Requests to: Unesco, 7 place de Fontenoy, 75700 Paris, France.

Economics of Environmental Conservation. Developments in Environmental Economics Vol.1. Clement A. Tisdell.

Elsevier Science Publishers, 1991, xxii + 234p. ISBN 0-444-89075-0.

The study of the relationship between economic systems and ecological and environmental ones is an important one. It affects all living organisms and is becoming increasingly recognized in policy circles worldwide. The more this relationship between economics and ecology is studied, the more aware we become that a great deal of our existing knowledge is imperfect and gaps need to be filled. This book specifies economic means for improved management of biological resources with environmental issues. Special attention is given to the consequences of economic growth and development on resource conservation and policies such as those

arising from the World Conservation Strategy and the Brundtland Report. The coverage in this volume is both innovative, modern and in a semantical sense, non-technical, based on the interdependence between economic, social and ecological systems.

Price: US\$ 118, Dfl 230.

Orders to: in the USA and Canada: Elsevier Science Publishing Co. Inc., P.O.Box 882, Madison Square Station, New York NY 10159, USA; Elsewhere: Elsevier Science Publishers, P.O.Box 211, 1000 AE Amsterdam, the Netherlands.

Imaging Spectroscopy: Fundamentals and Prospective Applications. Euro Courses Remote Sensing Vol.2. F. Toselli and J. Bodechtel, editors. Kluwer Academic Publishers, Boston, Dordrecht, 1991, viii + 266p. ISBN 0-7923-1535-9. Hardcover.

A new generation of optical remote sensing systems has evolved under the designation of 'imaging spectroscopy'. It represents a further step towards more accurate information of the physical properties of the earth's surface from remote platforms.

Imaging spectroscopy opens the possibility to gain precise information on the spectral characteristics of phenomena to be observed. In a wide field of research and application, imaging spectroscopy provides data to identify targets, to assess their chemical composition and to analyze changes or modifications of targets due to typically narrow diagnostic absorption features in hundreds of contiguous spectral channels in ranges from 0.4 to 2.45 μm and 5 to 20 μm . This technology opens a new domain for application in investigations on bare surfaces (geology, geochemistry and soils), vegetated surfaces (natural vegetation, agriculture and forestry), in oceanography and hydrology. Recently developed instruments are applied to ground-based and airborne campaigns. A future goal is the installation of imaging spectrometers on satellite platforms of the third generation.

This book covers the following: Principles of imaging spectroscopy; Review of existing ground-based and airborne instrumentation and outlook on future developments including space hardware; The application to different fields on the basis of projects and campaigns carried out in Europe, USA and Australia; The possibilities and needs for processing and evaluation of this complex high-rate data.

Price: Dfl 160; UK£ 54; US\$ 91.

Orders to: In U.S.A. and Canada: Kluwer Academic Publishers, 101 Philip Drive, Norwell, MA 02061, U.S.A. Elsewhere: Kluwer Academic Publ. Group, P.O. Box 322, 3300 AH Dordrecht, The Netherlands.

Abstracts on Sustainable Agriculture. Volume 3. J. Carls, editor. Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ), Eschborn, 1991, viii + 453p. ISBN 3-528-02062-8. Paperback.

This is the third publication to bear this title. These abstracts grew out of an intercropping project.

Intercropping, however, is just one of the many facets of sustainable agriculture, and it has thus been decided to expand the Abstracts to deal with a broader field. The abstracts are more comprehensive than the usual type of annotated bibliography. In all, this volume contains 262 abstracts.

Orders to: F. Vieweg Verlags GmbH, Postfach 300 944, D-5090 Leverkusen 3, Germany.

Metabolism of the Anthroposphere. P. Baccini and P.H. Brunner. Springer-Verlag, New York, Berlin, 1991, xii + 157p. ISBN 3-540-53778-3 (German edition) 0-387-53778-3 (US edition). Paperback.

The topic treated in this book is the dynamics of material fluxes in the immediate human environment - the anthroposphere. A comprehensive understanding of man's activities in connection with, for example, nutrition, hygiene, habitation and transport is essential for early recognition of limitations of resources and environmental impact. The methodology of flux analysis is introduced, with examples on how to qualify and quantify the metabolism of complex

biological and cultural systems. This is an entirely new approach to describing geogenic and anthropogenic systems. The perceptions gained by material flux analysis complement those obtained in life science (e.g. human toxicology), environmental sciences (e.g. ecotoxicology) and social sciences (e.g. economics, sociology). Their application enables a control on regional material fluxes (resource and waste management, environmental impact studies) and the development of cybernetic strategies for the metabolic evolution of the anthroposphere.

Price: DM 118 (Hardcover), DM 98 (Softcover).

Orders to: In U.S.A. and Canada: Springer-Verlag, 175 Fifth Avenue, New York NY 10010, U.S.A. Elsewhere: Springer-Verlag, Heidelberger Platz 3, D-1000 Berlin 33, Fed.Rep. of Germany.

Alternative Agriculture. Scientists' Review. Special Publication No. 16. Council for Agricultural Science and Technology (CAST), Ames, 1990, x + 192p. ISSN 0194-407X. Softcover.

This volume provides reviews that both support and criticize the National Research Council (NRC) report, *Alternative Agriculture*. These reviews were prepared by 44 leading scientists representing a broad range of disciplines. The reviewers agree that the NRC report raises several important issues that contribute to the establishment of a national dialogue and possibly a research agenda that would assure an economically viable, sustainable U.S. agricultural system. However, they caution that before major national policy shifts are instituted, further research on alternative agricultural practices is necessary.

The position of the CAST reviewers is not to defend the status quo, but to support the common goal of undergirding U.S. agriculture with the technologies and infrastructure such that all resources are utilized with maximum efficiency and environmental compatibility while assuring economic competitiveness. Such an agricultural system should be sustainable. Federal farm programs should not discourage the adoption of alternative agricultural practices that meet the above criteria. The CAST review concludes that the NRC report should be viewed as a critique for adjusting, where necessary, an agricultural system that has served the United States and the world well.

Price: \$ 15

Orders to: CAST, 137 Lynn Avenue, Ames, IA 50010-7120, U.S.A.

Foundations of Ecology. L.A. Real and J.H. Brown (editors). The University of Chicago, Chicago and London, 1991, xiv + 904p. ISBN 0-226-70594-3. Paperback.

Assembled in this volume are forty classic papers that have laid the foundations of modern ecology. Whether by posing new problems, demonstrating important effects, or stimulating new research, these papers have made substantial contributions to an understanding of ecological processes, and they continue to influence the field today. The selections span nearly nine decades of ecological research and reveal a striking variety of approaches.

The papers are organized in six sections: Foundational papers; Theoretical advances; Synthetic statements; Methodological development; and Experiments in ecology. To add to the value of the papers themselves, contemporary ecologists and a historian of ecology introduce each section with an original essay that places the papers in context and discusses their continued relevance to current research. This combination of classic papers and fresh commentaries makes this book a convenient reference to papers often cited today and a guide to the intellectual and conceptual roots of the field.

Price: US\$ 27.50

Orders to: The University of Chicago Press, 11030 South Langley Avenue, Chicago, IL 60628, U.S.A.

Cover Crops for Clean Water. W.L. Hargrove, editor. Soil and Water Conservation Society, Ankeny, 1991, xi + 198p. ISBN 0-935734-25-2. Paperback.

This publication is intended to summarize, augment, and extend the information presented at the conference held in April 1991 in Jackson. It looks at the positive and negative implications

of using cover crops to achieve soil conservation and water quality management goals. Authors discuss the effects of cover crops on runoff and soil erosion and on surface water and groundwater quality; the role of such crops in nitrogen cycling, maintenance of soil productivity, weed management, integrated crop production and livestock production, and pest management; and development of cover crop germplasm.

Price: US\$ 15

Orders to: Soil and Water Conservation Society, 7515 Northeast Ankeny Road, Ankeny, IA 50021-9764, U.S.A.

Editing and Publication. Vol. 1. A training manual. I. Montagnes. International Rice Research Institute, 1991, xvi + 429p. ISBN 971-22-0009-4. Paperback. Vol. 2. A handbook for trainers. I. Montagnes. International Rice Research Institute, Manila, 1991, vii + 107p. ISBN 971-22-0008-6. Paperback.

Too little of the scientific work done in the national agricultural research systems of developing countries reaches the people who can use it. Scientists build on the advances made by others; extension and health-care workers, teachers, farmers, and others turn new knowledge into increased productivity and better lives for the people with whom they work. Among the reasons for the continuing lag in knowledge transfer from discovery to use is a shortage of men and women trained in the techniques of scientific reporting or skilled in the art of simplifying research results for greater understanding by a broad public. More trained editors are needed.

The course was designed specifically to help editors attached to research institutes and extension agencies in Asia, Africa, and Latin America. Many of them work in small departments or on their own. The course therefore extended beyond editing to other publishing functions - not exhaustively but at a level an editor might find useful. The manual does not offer answers to every editorial problem, in the nature of a style guide. More often it suggests the questions an editor should ask. Its goal is to provide an analytical framework within which to approach almost any editorial problem.

The publication of these manuals will expand the availability of the writing and editing expertise needed for wider dissemination and application of new knowledge in science.

Price: per set: US\$ 32 (developed countries), US\$ 7 (developing countries), + US\$ 3 for surface mail (US\$ 20 airmail) postage.

Orders to: IRRI, P.O. Box 933, Manila, Philippines.

Soil Assessment. 2nd edition, revised by J. Archer. Soil and Water Management Association, Huddersfield, 1988. 16p. Glossy cover.

In almost every sphere of activity attention is often misdirected and the wrong priorities given to the use of time. Farming is no exception, and during this half-century, when such enormous developments have taken place in the mechanisation of husbandry, there has been too much neglect of the soil itself. For a farmer, knowledge of the soil and how to succour and exploit it is completely fundamental and should come before everything else. It is hoped that there is something of a 'fundamentalist revival' and that more and more soil assessment will take its rightful place as the first and senior priority in the annual planning of each and every farmer.

This booklet is designed to be a simple bible for the assessment of different types of soils and their varying interactions with water.

Price: £ 1.50 (reductions for bulk orders)

Orders to: see below.

Tillage. What now and what next?. G.G. Baldwin, editor. Soil and Water Management Association, Huddersfield, 1988. 55p. Paperback.

This volume is the report of the proceedings of a one day Conference held at the Rothamsted Experimental Station in February 1987. It constitutes the edited transcript of written and verbal presentations and discussions on this subject.

Price: £ 6.

Orders to: Soil and Water Management Association Ltd., (SAWMA), 22 Edgerton Grove Road, Huddersfield, W. Yorkshire, HD1 5QX. U.K.

Soil Conservation in Developing Countries: Project and Policy Intervention. Policy and Research Series 8. J.R. Anderson and J. Thamapillai. The World Bank, Washington, 1990, v + 45p. ISBN 0-8213-1448-3. Paperback.

Soil degradation is a serious ecological and economic problem in many developing countries. This report provides a socioeconomic analysis of land degradation. It examines the effectiveness of a number of policies designed to help solve the problem.

Many factors influence the decisions of farmers to adopt soil conservation measures. These include income, access to low-cost credit, educational level of farmers, access to sound technical advice, security of land tenure, high subsidies on agricultural supplies, and population pressures. The authors pay particular attention to price supports and taxes, the availability of new agricultural technology, and the attitude of farmers toward taking risks.

The report describes what development agencies can do to promote soil conservation. It also outlines future directions for research in the field.

Price: US\$ 5.95

Orders to: See below.

Using Indigenous Knowledge in Agriculture Development. World Bank Discussion Paper 127. D.M. Warren. The World Bank, Washington, 1991, 46p. ISBN 0-8213-1884-5. Paperback.

The belief that indigenous knowledge systems are simple and static is changing fast. Many societies with simple technologies have very complex and sophisticated knowledge about their natural resources. All knowledge systems are dynamic, characterized by both continuity and change. Change is not random, but rather predicted upon conscious efforts by people to define their problems and seek solutions through local experiments, as well as by evaluating technologies developed elsewhere.

There is growing evidence of the positive uses of indigenous knowledge in development projects. History shows that combining indigenous knowledge with more formal decision-making, community participation, capacity-building, and sustainability can all be enhanced in cost-effective ways.

This paper reviews three types of project scenarios: (1) projects in which local knowledge provided an improved approach to managing natural resources; (2) projects that inadvertently ignored indigenous structures; and (3) projects whose success at meeting their objectives can be linked to the deliberate inclusion of indigenous knowledge.

Price: US\$ 5.95

Orders to: see below.

Research on Irrigation and Drainage Technologies. Fifteen Years of World Bank Experience. World Bank Discussion Paper 128. R. Safadi and H. Plusquellec. The World Bank, Washington, 1991, 56p. ISBN 0-8213-1891-8. Paperback.

The objective of this paper is to identify and review the scope and extent of agricultural research components in general and research on irrigation and drainage technologies in particular in Bank-supported irrigation projects. It is based on an extensive review of the Appraisal Reports of the 256 Irrigation and Drainage Projects that were approved during the period 1974-1990.

The report contains detailed country-by-country as well as regional statistics on the levels, trends and patterns of investments in research on irrigation and drainage technologies. It does not include any assessment of the effectiveness of these research components.

Orders to: See below.

Risk in Agriculture. D. Holden, P. Hazell and A. Pritchard, editors. The World Bank, Washington, 1991, v + 159p. ISBN 0-8213-1965-5. Paperback.

This volume contains the proceedings of the Tenth Agriculture Sector Symposium, held in 1990. The theme "Risk in Agriculture" directed attention to several key aspects of risk in agricultural development and agricultural policies and how to manage such risk.

This volume includes papers presented at the opening day plenary session and during the parallel sessions on both days of the symposium. It is designed to be a permanent record to further enhance the knowledge of Bank staff working in agriculture and rural development and as a means of exchanging knowledge with others working in agricultural development, particularly in the area of risk in agriculture.

Orders to: The World Bank, Publications Department, J2152, 1818 H Street, N.W., Washington D.C. 20433, U.S.A.

Dynamics of Nutrient Cycling and Food Webs. D.L. DeAngelis. Population and Community Biology Series 9. Chapman & Hall, London, New York, 1992, xv + 270p. ISBN 0-412-29840-6 (paperback), 0-412-29830-9 (hardback).

Since nutrients can become limiting resources in ecological systems, the way these nutrients are recycled, as well as their actual exhaustion, is of great importance to the growth and stability of populations and their resistance to perturbations. Thus the topic of nutrient cycling and food web dynamics is of crucial importance in ecology and this book is a synthesis of the subject.

A number of years ago, the data available on the cycling of nutrients within food chains was scant compared with the subject of food webs and communities generally. However, the time is now right for a summary of awakening of interest in this important topic. The author has described and explained the topic in a clear and readable way. It is meant for all with an interest in ecology. A stimulating final chapter discusses the implications for the major problem of global climate change.

Price: £ 17.95 (paperback).

Orders to: See below.

Primary Productivity of Grass Ecosystems of the Tropics and Sub-Tropics. S.P. Long, M.B. Jones and M.J. Roberts, editors. Chapman & Hall, London, New York, 1992, xvi + 267p. ISBN 0-412-41020-6. Hardback.

The United Nations Environment Programme (UNEP) has initiated a programme of intensive research into the primary productivity of grass ecosystems in both the tropics and subtropics, the results of which are gathered together in this book. It therefore represents the first internationally integrated study of bio-productivity since the International Biological Programme (IBP) of the early 1970s.

A large international team of scientists identified five different grassland ecosystems, determining their levels of productivity as well as the effect of climatic variation on primary production and photosynthesis. The methods and results described indicate a three- to ten-fold increase in estimates of productivity from the IBP figures, raising implications for important questions such as: the understanding of how carbon is cycled, the environmental impact of removing grasslands, assessment of these ecosystems as genetic resources of productive grasses, assessing the impact of rising carbon dioxide levels in the atmosphere and establishing ground truth data for remote sensing of grassland productivity.

This book provides an assessment of an extremely important but under-researched biome.

Price: £ 35.

Orders to: Routledge, Chapman & Hall Ltd., Cheriton House, North Way, Andover, Hampshire SP10 5BE, England.

Methods Manual for Forest Soil and Plant Analysis. Y.P. Kalra and D.G. Maynard. Minister of Supply and Services Canada, 1991, vii + 116p. ISBN 0-662-18665-6. Paperback.

This manual is a compilation of methods used for soil and plant analysis at the Analytical Services Laboratory of the Northern Forestry Centre (NoFC) of Forestry Canada's Northwest Region. The intent of this manual is not so much to recommend certain procedures over others,

but to indicate methods used in that laboratory, why these methods are used, their expected precision and accuracy, and their strengths and weaknesses.

Price: free of charge

Requests to: Forestry Canada, Northwest Region, Northern Forestry Centre, 5320-122 Street, Edmonton, Alberta, Canada T6H 3S5.

Analytical Abstracts on Farmer Participatory Research. K. Amanor. AAU Occasional Paper 10. Overseas Development Institute, 1990, 140p. ISBN 0-85003-138-9. Paperback.

In recent years agricultural researchers working with low-income farmers in difficult environments in developing countries have been creating new models and methodologies for agricultural research. These environments tend to be highly fragile, characterised by combinations of low and unreliable rainfall, poor and easily degradable soils, hilly topographies, and a lack of economic and social infrastructure. The conditions in which research is carried out on conventional agricultural research stations and experimental farms do not reflect these environments. As a result, technologies generated on research stations have not performed well under farm conditions and have not been widely adopted. Resource-poor environments are also highly diverse. Research strategies are needed which take this into account and enable technologies to be adapted and tailored to a variety of farm conditions.

Efforts to overcome these problems have led to the development of methods of collaborating with farmers to understand local level farm conditions and strategies, and the processes through which small-scale cultivators adopt and adapt new agricultural technologies. It is this collaboration which has become known as farmer participatory research or participatory technology development.

These analytical abstracts deal first with conceptual and general methodological issues in participatory research, moving on to examine their practical application in diagnosis, on-farm experimentation and dissemination of agricultural technology. A final section examines efforts to design research strategies along more participatory lines.

Price: £ 7.95

Orders to: Overseas Development Institute, Regent's College, Inner Circle, Regent's Park, London NW1 4NS, England.

Air, Water and Nutrient Interactions in Paddy Soils. M.J. Abedin Mian. Schriftenreihe No.10. Institut für Pflanzenernährung und Bodenkunde, Kiel, 1990, ix + 173p. ISSN 0933-680X. Experiments were carried out in the three permanent manurial plots of Bangladesh Agricultural University farm soil (Aeric Haplaquepts; Sonatola silt loam) under different fertility and water management conditions. The objectives of the experiments were to study the nutrient dynamics and ultimately making a nutrient balance for paddy soils under normal practices or rice production.

Price: DM 15

Orders to: Institut für Pflanzenernährung und Bodenkunde, Christian-Albrechts-Universität Kiel, Olshausenstrasse 40, D-2300 Kiel, Germany.

Ecological Water Management in Practice. J.C. Hooghart and C.W.S. Posthumus, editors. Proceedings and Information No. 45. Netherlands Organization for Applied Scientific Research TNO, Delft, 1991, 104p. ISBN 0-6743-192-3. Paperback.

A large part of the Netherlands consists of wetlands; the Dutch created land from water but create also water in reclaimed land. This activity became clearly visible in the polder landscape with its numerous canals, ditches and shallow lakes. Rivers were regulated and also most of the brooks on the higher sandy soils. Estuaries were cut off from the sea by dams which prevent normal tidal effects and sea water intrusion. The original flora and fauna was and is affected by these works so that natural hydro-environments are rare in the country. Still existing "natural" hydro-environments survive by the gratitude of special planning and managing water and land.

Nowadays in managing surface water, many aspects have to be considered to realize a balanced aquatic ecosystem. Recent studies have provided tools for managers to do so but by

far not all problems have been solved at this moment. However, a number of practical tools are presented in this publication.

Price: Dfl 35

Orders to: CHO-TNO, P.O.Box 6067, 2600 JA Delft, the Netherlands.

Caring for the Earth. A Strategy for Sustainable Living. IUCN, UNEP, WWF, 1991, iv + 228p. ISBN 2-8317-0074-4 (English), 2-8317-0075-2 (French); 2-8317-0076-0 (Spanish). Paperback. (Including Summary booklet).

This volume is intended to re-state current thinking about conservation and development in a way that will inform and encourage those who believe that people and nature are worth caring about and that their futures are intertwined. It is also intended to persuade people at all levels that they can do something, or help cause something to be done, that will lead to better care for the Earth. It is a follow-up of the World Conservation Strategy published in 1980.

The text has three parts. Part I, The Principles for Sustainable Living, begins with a chapter that defines principles to guide the way toward sustainable societies. The following eight chapters recommend activities that will give substance to the principles. Part II, Additional Actions for Sustainable Living, describes corresponding actions that are required in relation to the main areas of human activity and some of the major components of the biosphere. Part III, Implementation and Follow-up, consists of one chapter which proposes guidelines to help users adapt the strategy to their needs and capabilities and implement it, and sets out how the sponsors propose to follow up the Strategy and involve the community of users in its follow-up. It also contains a listing of all the recommended priority actions and suggested targets.

Orders to: IUCN, Avenue du Mont-Blanc, CH-1196 Gland, Switzerland

Quantitative Mineral Analysis of Clays. D.R. Pevear and F.A. Mumpton, editors. CMS Workshop Lectures 1. Clay Minerals Society, Evergreen, 1989, vii + 171p. Paperback.

The present volume is the first of a new series and is based on updated versions of several of the lectures presented at a Workshop on Quantitative Mineral Analysis of Clays held in 1985. The subjects treated in this book provide a sound basis for the quantitative analysis of clay phases. It is intended for students who wish to begin their investigation of clay mineral quantification and for professionals who want to renew their acquaintance with this difficult but important subject.

Price: US\$ 14 (+ US\$ 2 for postage)

Orders to: The Clay Minerals Society, P.O. Box 4416, Boulder, CO 80306, U.S.A.

Plantgro. A Software Package for Coarse Prediction of Plant Growth. C. Hackett. CSIRO, St. Lucia, 1991, xiii + 242p. + 2 disks. ISBN 0-643-05292-5 (book) 0-643-05293-3 (disks) 0-643-05294-1 (set). Paperback.

Based on a concept of scale or levels, plantgro recognises that people have been predicting plant growth by mental methods for thousands of years. By coupling these methods with modern scientific methods, it provides new ways of recording the requirements of plants and predicting their growth.

The handbook encourages users to go at their own pace. In this way, people who have a strong feeling for plants but have had little contact with computers or formal plant science quickly realise that their expertise is valuable and can be recorded. The package provides starter data-files for 60 plants, 30 soils and 40 climates.

Software: program language GWBASIC (not provided). System: MS DOS 3.2 or higher. Total access is given to the software. Editing and upgrading of data-files can be performed by using a simple word processing package.

Orders to: CSIRO Publications, 314 Albert Street, East Melbourne, Victoria 3002, Australia.

A Strategy for Coordinating Soil Survey and Land Evaluation in Australia. N.J. McKenzie. Division of Soils, Report 114. CSIRO, St. Lucia, 1991, 52p. ISBN 0-643-05080-9. Paperback.

There is a serious lack of reliable information on the soil and land resources of Australia.

The current survey coverage is incomplete and survey data cannot be used to resolve a range of contemporary problems. Ironically, the lack of information is greatest in areas of economic importance and environmental significance. Land resource information is needed to establish sustainable use, guide management and determine the extent of degradation. A more coordinated and accelerated program of soil and land survey is essential. Improvements to methods of survey are also necessary.

Methods of soil survey and land evaluation are considered and this is followed by a review of current practice in Australia. Numerous deficiencies and inconsistencies with current practice are identified. A strategy for soil survey and land evaluation is then presented.

Price: free of charge

Orders to: Information Officer, CSIRO Division of Soils, Private Bag No 2, Glen Osmond, South Australia 5064, Australia.

A methodological Manual of Soil Micromorphology. G.V. Dobrovol'ski, editor. Publications Series No.3, International Training Centre for Post-Graduate Soil Scientists, Ghent, 1991, 79p. (Translated from Russian). Paperback.

In the last 20 years a huge development in micromorphological research in many pedological, geographical and agricultural scientific research and study centres has taken place. Micromorphology is more and more actively associated with pedogenetic and geographical research and applied studies. The appearance of a large number of soil thin section descriptions made it necessary to introduce various terms which were not always strict enough and were understood differently. The Russian terms are widely used together with those of leading micromorphologists such as Kubiena, Brewer and Bal. The lack of a precise systematization of the terms and their definitions results in different interpretations of the same phenomenon and hampers a further development and practical use of micromorphological methods.

This publication should be seen as a more comprehensive and specified variant of the first methodological work called "An outline of the description and the terms of micromorphology of soils" published in 1972. It contains all the collectively discussed terms and their definitions with only a few other ones added. Every group of terms is presented with an explanatory text, illustrations and figures. Brief sections about the method of sample collection, the preparation of samples for research and the treatment and interpretation of the materials obtained, are also added.

Orders to: International Training Centre for Post-Graduate Soil Scientists, Rijksuniversiteit Gent, Krijgslaan 281-S8, B-9000 Gent, Belgium

Caractéristiques et Fonctionnement d'un Ecosystème Agro-piscicole Aménagé dans les Marais du Tabasco (Mexique). H. Halen, J.L. Rosado Couoh, J.C. Micha et J. Meyer. Presses Universitaires de Namur, 1991, 44p. ISBN 2-87037-151-9. Cartoné.

Dès 1978, le gouvernement de l'état de Tabasco (Mexique) a voulu répondre à la demande de terres de culture de la population croissante des Indiens chontales de la région de Tucta en construisant des hortillonnages dans la zone marécageuse entourant leur village. Depuis 1980, une réflexion pour la valorisation des zones marécageuses inondables (30% de l'état de Tabasco) a été engagée et une étude plus approfondie de ce nouvel écosystème agro-piscicole a été entreprise.

Ce document fait la synthèse des connaissances actuelles d'un système original qui s'inspire de techniques ancestrales aztèques et mayas et qui vise à valoriser les ressources terres et eaux de zones marécageuses à des fins d'agriculture et de pisciculture combinées.

Alternative au drainage trop systématique et parfois destructeur des marais, cette technique consiste à récupérer des terres en construisant des billons non inondables alternant avec des canaux ou étangs. Les auteurs font la synthèse d'observations portant sur deux années consécutives. Puisant tant dans la littérature internationale que dans leurs expériences de production agricole et piscicole en régions tropicales notamment africaines, ils évaluent les points forts et faibles du système actuel et fixent les principes de base pour une meilleure conception de ce type d'aménagement potentiellement performant.

Prix: FB 300

Commandes à: Presses Universitaires de Namur, Rempart de la Vierge 8, B-5000 Namur, Belgique.

Combating Soil Erosion in Vineyards of the Mosel-Region. G. Richter, editor. Forschungsstelle Bodenerosion, Vol. 10. Universität Trier, 1991, 151p. ISBN 3-927079-08-1. Paperback.

The aim of this publication is to serve as an introduction into nature, agriculture and viticulture of the Mosel Region on both sides of the border between Germany and Luxembourg and to give a presentation of some investigations concerning soil erosion and conservation work in vineyards of the region. The volume consists of two parts: In the first part the region and its viticulture are described and the main problems of soil erosion and conservation stressed. The second part presents the results of some investigations which have been elaborated at the Soil Erosion Measurement Station at Mertesdorf/Ruwertal.

Price: DM 25

Orders to: See below.

Interaction between Agricultural Systems and Soil Conservation in the Mediterranean Belt. European Society for Soil Conservation, 1990. Paperback.

Portugal, although having no Mediterranean shore line, has the Mediterranean type of climate with rainy winters and dry summers. Sheet erosion is the form of erosion that is present all over the country in connection with the dry land farming, mainly winter small grain, olive groves and vineyards. The consequences of sheet erosion in the soil productive potential are not evident, due to an increasing use of fertilizers and to the formation of perched water tables during the rainy period. The assessment of these problems depends on the understanding, under a multidisciplinary approach, of the behaviour of the different soils during the erosion process in relation to water movement and runoff.

This volume is the proceedings of a Seminar with the same title held in Portugal in September 1990. Its purpose was to raise international attention to particular problems of the Mediterranean belt and to focus questions of the interaction between agricultural systems and soil conservation. The seminar was organized around the following themes: (1) Changes in agricultural systems in the Mediterranean region and soil conservation; (2) Feasibility of the soil conservation measures; (3) Transfer to the farm level of soil conservation knowledge; and (4) Other studies.

Price: DM 20 (+ DM 2 for postage)

Orders to: Prof. Dr. G. Richter, Universität Trier, Postfach 3825, D/W-5500 Trier, Germany.

Shrubs and Tree Fodders for Farm Animals. International Development Research Centre, Ottawa, 1990, xii + 349p. ISBN 0-88936-556-3. Paperback.

This volume is the proceedings of a Workshop held in Denpasar, Indonesia in July 1989. It addresses feed- resource availability, use by ruminants and nonruminants, processing methodology, economics, and development issues. These aspects and the current knowledge on shrubs and tree fodders are further highlighted by case studies detailing prevailing situations and policy matters.

While the papers have a bias towards Southeast Asia, there is also coverage of the situation elsewhere and it is expected that these proceedings will provide a valuable reference source for researchers in many parts of the world.

Price: CDN \$ 18

Orders to: IDRC, P.O.Box 8500, Ottawa, Ontario, Canada K1G 3H9.

Einführung in die Bodenphysik. 2. überarbeitete und erweiterte Auflage. K.H. Hartge und R. Horn. Enke Verlag, Stuttgart, 1991, xv + 303 S.

Ziel dieses Buches ist, die Lücke zwischen den Lehrbüchern der allgemeinen Bodenkunde und den sehr speziellen Lehrbüchern einzelner physikalischer Bereiche wie Bodenmechanik, Hydraulik und Hydrologie zu schließen. Die Darstellung umfaßt daher den gesamten Bereich der physikalischen Phänomene des Bodens, beginnend bei der Körnung über Eigenschaften der

festen, flüssigen und gasförmigen Phase bis zur Wärme im Boden. Neben den Phänomenen selbst sind stets ihre Veränderungen in Raum und Zeit (Wasser-, Luft- und Wärmehaushalte, Erosion/Akkumulation, Filterwirkungen) dargestellt sowie Hinweise auf ihre Beeinflussbarkeit gegeben (Meliorations und Umwelttechnologien). In der 2. Auflage wurden die Kapitel über Gefüge, Wechsel- beziehungen fest/flüssig, Erosion und Filterfunktionen erweitert.

Preis: DM 48

Bestellungen an: Ferdinand Enke Verlag, Postfach 10 12 54, D/W-7000 Stuttgart 10, Deutschland.

Chemistry, Agriculture and the Environment. M.L. Richardson, editor. The Royal Society of Chemistry, Cambridge, 1991, xiv + 546p. ISBN 0-85186-228-4. Hardcover.

This book highlights the essential role of chemistry in evaluating the usage of agrochemicals and their impact on the environment and reviews the scientific aspects of the interrelationship between all three.

It provides an overview of chemical pollution of the environment caused by modern agricultural practices worldwide and covers the effects of agrochemicals in intensive animal and crop production on air, water, soil, plants, animals, and man. The authors explain the problems and their implications and discuss how they may be alleviated or overcome. This book, containing chapters from countries in Eastern and Western Europe and from the USA, Costa Rica, India, China, Israel and Nigeria, will be of interest to scientists, engineers, farmers, regulatory bodies, journalists and politicians concerned with this issue.

Price: £ 69.50

Orders to: Royal Society of Chemistry, Turpin Transactions Ltd., Blackhorse Road, Letchworth, Herts SG6 1HN, U.K. or: CRC Press Inc., 2000 Corporate Boulevard N.W., Boca Raton FL 33431, U.S.A.

Humic Substances in Soil and Crop Sciences: Selected Readings. P. MacCarthy, C.E. Clapp, R.L. Malcolm and P.R. Bloom, editors. American Society of Agronomy, American Society of Soil Science, Madison, 1990, xvii + 281p. ISBN 0-89118-104-0. Hardcover.

This publication reviews some of the methodologies to characterize humic substances in soil and summarizes information on the effects of these materials on soils and plant growth as related to nitrogen fertilizers. The influence of sewage sludge on soil humic substances and interaction of pesticides with humic substances are also discussed.

The contents emphasize the importance of humic substances to environmental effects in soil management practices. This book is presented as a compendium of selected readings that address some aspects of the influence of humic substances on soil and plant growth.

Price: US\$ 30 (plus 10% per book for postage outside the USA). Prepayment required.

Orders to: SSSA, ASA Headquarters Office, Book Order Department, 677 South Segoe Road, Madison WI 53711- 1086, U.S.A.

Soil Science. An Introduction to the properties and management of New Zealand soils. R.G. McLaren and K.C. Cameron, Oxford University Press, Auckland, Melbourne, 1990, viii + 294p. ISBN 0-19-558186-5. Paperback.

Soil is one of New Zealand's greatest resources. This book introduces the basic soil science theory which is essential for the proper use and maintenance of this resource. The authors have provided a straightforward introduction to soil science which is specifically designed for New Zealand.

Pedology, soil chemistry and fertility, soil physics and soil management are all covered. Each subject has been placed in a New Zealand context, and many specific examples are given by way of illustration. Soil science theory is linked with practical soil management and fertilizer recommendation procedures. The main emphasis is on soil conditions affecting plant growth, but other subjects, such as the distribution of soils in New Zealand and the influence of soils on environmental quality, are also described.

While the book has been designed for use by students studying soil science as part of degree and diploma courses, it will also be of use to teachers of agriculture and horticulture, to scientists

and consultants involved in agriculture, horticulture, and land management, as well as to farmers, growers, and anyone with an interest in the science of the soil or its practical management.

Price: NZ\$ 59.95 in New Zealand

Orders to: see below.

The Environmental Impact of Burrowing Animals and Animal Burrows. P.S. Meadows and A. Meadows, editors. Zoological Society of London Symposia 63. The Zoological Society of London, 1991, xviii+ 349p. ISBN 0-19-854680-7. Hardbound.

The purpose of this symposium has been to describe the environmental impact of burrowing animals and animal burrows and their effects on and interactions with terrestrial and aquatic ecosystems. Burrowing animals themselves, the nature of their burrows and the purposes for which they dig them are enormously varied. The field widens still further if one includes not only animals that burrow into soil or sediment, but those that burrow into living organisms -plant tissue or flesh.

To cover the whole field would not be possible in one symposium. It has been chosen to juxtapose examples of borrowing by an individual animal or a group of animals, taken from either terrestrial or aquatic ecosystems, and focusing on the various aspects of their environmental impact. Individually they give valuable accounts of current work on the effects of burrowing by a wide variety of organisms. Collectively, they bring out the sheer scale and importance of an activity taking place in almost every terrestrial and aquatic environment and involving immense quantities of material. They also give a wide representation of the kinds of questions that are being asked about the impact of burrowing, in general and in relation to particular species. In considering environmental impact, where the starting point may be one species but its effects are followed outwards into an increasing complexity of interrelations, knowledge of work exploring similar processes in other organisms and environments must be important.

Price: £ 45

Orders to: Oxford University Press, Walton Street, Oxford OX2 6DP, U.K.

Operational Satellites: Sentinels for the Monitoring of Climate and Global Change. Special Issue of the Journal "Global and Planetary Change". Elsevier Science Publishers, Amsterdam, New York, 1991, ix + 328p. ISSN 0921-8181.

This special issue consists of the Proceedings of a Conference held in Washington DC in October 1990, in the form of condensed papers on the following topics: Climate products currently being obtained from operational satellites and the scientific algorithms that are being used; The application of satellite data and information products to climate and global change studies; Calibration of operational satellite instruments and validation of derived products; The availability and accessibility of operational satellite data; and The plans of the national space agencies for launching future operational and other satellite systems.

Among the satellite derived climate and global change information products discussed at the meeting were winds, atmospheric temperature and moisture soundings, the Earth's radiation budget, precipitation, ozone, clouds and aerosols, sea surface temperatures, vegetation index, and snow and sea ice.

Orders to: see below.

Lateritic Bauxites. Developments in Economic Geology 27. G. Bárdossy and G.J.J. Aleva. Elsevier Science Publishers, Amsterdam, New York, 1990, 624p + 42 full colour plates. ISBN 0-444-98811-4. Hardbound.

Bauxites are the main raw materials for the production of metallic aluminium. Most of the world's bauxite resources are lateritic bauxite deposits.

The authors of this book have spent most of their lives in bauxite exploration and research, and have visited many of the world's lateritic-bauxite areas. They here attempt to synthesize their scientific and practical experience and at the same time evaluate all available information on the deposits.

The first six chapters outline the scientific aspects of bauxite and laterite formation, whilst the seventh presents a systematic description of the main bauxite districts. Chapter eight deals with exploration, tonnage and grade estimation, beneficiation and mining. A glossary of the special terms used completes the work.

Price: Dfl 295 or US\$ 151.25

Orders to: see below.

Modern Ecology: Basic and Applied Aspects. G. Esser and D. Overdieck, editors. Elsevier Science Publishers, Amsterdam, New York, 1991, xxx + 844p. ISBN 0-444-89183-8. Hardbound.

This book is based on many case studies in the broad area of ecology and is derived from numerous sources originating from several countries. The book begins with discussions on morphology, stand structure, competition, mass and water balance at the stand level of vegetation as well as mineral cycles. A section deals with disturbances and management of agricultural as well as semi-natural systems. With the input of several authors, zoologists, botanists and geographers, detail is given to the eutrophication and pollution in terrestrial ecosystems. Included as well are discussions on the carbon cycle as it relates to current climate change and modern methods of remote sensing and geographical modelling. The book concludes with a chapter on urban and landscape ecology.

The main feature of this important publication is that it includes most methods and tasks of modern ecology using case studies and incorporating all levels of integration from single plants and animals to populations and ecosystems.

Price: Dfl 450 or US\$ 231

Orders to: In USA and Canada: Elsevier Science Publ. Comp., P.O. Box 882, Madison Square Station, New York NY 10159, U.S.A.; Elsewhere: Elsevier Science Publishers, P.O. Box 211, 100 AE Amsterdam, the Netherlands.

Sedimentary Petrology. 2nd Edition. H. Blatt. W.H. Freeman, Oxford, New York, 1992, xiv + 514p. ISBN 0-7167-2273-9. Hardbound.

The purpose of this book, as of the first edition of 1982, is to serve as an introduction to the mineral composition, texture, and origin of sedimentary rocks. The discussion of chemical processes in rock formation has been lengthened because of its rising importance in the literature of sedimentary petrology, but the emphasis of the first edition has been retained: the appearance and interpretation of sedimentary rocks as seen in outcrop and in the laboratory. It is supplemented with a useful glossary.

Price: £ 38.95

Orders to: W.H. Freeman and Company Ltd., 20 Beaumont Street, Oxford OX1 2NQ, England.

Tropical Ecosystems. Systems Characteristics, Utilization Patterns, and Conservation Issues. *Proceedings of the International and Interdisciplinary Symposium, Saarbrücken, June 1989.* W. Erdelen, N. Ishwaran, P. Müller, editors. Verlag J. Margraf, 1991, 202p. ISBN 3-8236-1183-6. Paperback.

The contents of this proceedings volume comprise papers from the African, American and Asian tropics. Neither an overview of all tropical ecosystems nor a complete analysis of the problems associated with utilization and conservation of tropical ecosystems could be attempted within the framework of a single symposium. Instead, this symposium aimed at highlighting the complexity of the tropical ecosystems themselves as well as the questions and problems arising from human impacts on the tropical environment. The understanding of patterns and processes, in natural as well as human impacted tropical ecosystems, is essential for the search for solutions to problems such as species extinction, protection of representative samples of natural ecosystems and the development of sustainable resource management strategies. In this sense the Symposium provides useful insights and raises issues that could be further elaborated.

Price: DM 49

Orders to: Verlag Josef Margraf, Postfach 105, D-6992 Welkersheim, Germany.

Une Lutte de longue haleine. Aménagements anti-érosifs et gestion de terroir. Collection "Systèmes de Production Rurale au Mali", vol. 2. J. Hijkoop, P. van der Poel, B. Kaya. Institut d'Economie Rurale, Bamako et Institut Royal des Tropiques, Amsterdam, 1991, 154p. ISBN 90-6832-037-8. Cartonné.

Le Mali-Sud, en particulier le Nord de la zone, subit, du point de vue écologique, une dégradation de plus en plus alarmante, comme toutes les zones sahéliennes et soudaniennes de l'Afrique. Différentes approches pour lutter contre ce fléau ont vu le jour depuis les années soixante, Certaines sont présentées brièvement dans l'introduction.

L'érosion des champs est une contrainte importante des systèmes de production. La Division de Recherche sur les Systèmes de Production Rurale (drspr) a d'abord testé une approche basée sur les connaissances locales et des théories techniques. L'approche a ensuite été ajustée sur la base des observations des paysans et des besoins de la vulgarisation et mise en oeuvre dans quelques nouveaux villages. Sur la base de cette expérience, un programme de lutte anti-érosive a été proposé à la vulgarisation. La politique, les résultats, les observations et les contraintes de ce projet sont décrits dans ce document.

En conclusion, il est constaté que ce programme est encore loin d'atteindre son objectif: une exploitation soutenue des ressources naturelles. Il apparaît nécessaire de prendre des mesures visant à accélérer la lutte contre la dégradation et l'érosion.

Prix: Hfl 35

Commandes à: Institut Royal des Tropiques (KIT), Mauritskade 63, 1092 AD Amsterdam, Pays-Bas.

Global Digital Datasets for Land Degradation Studies: a GIS Approach. GRID Case Study Series No.4. U. Deichmann and L. Eklundh. UNEP, Nairobi, 1991, ii + 103p. Paperback.

This report describes the work of GRID (Global Resource Information Database) in assembling the core data sets used in the production of the global and regional sections of a World Atlas of Thematic Indicators of Desertification. Its aim is to serve as a source of background information rather than as a detailed analysis of the data generated. In the course of the project, new data sets as well as existing ones stored in the GRID archives have been utilized. Part 2 of the report gives a technical background to the study. Concepts of geographic analysis are introduced, and methodologies for the production of numeric and cartographic output are presented. The core data set of the project, the Global Assessment of Soil Degradation (GLASOD) is discussed in Part 3. Part 4 deals with the production of a coverage of climatic zones, while Part 5 presents the methodology chosen by GRID analysts to include these data in the global and regional desertification study. The data sets collected and assembled in the course of this study offer many possibilities for analysis.

Orders to: UNEP, P.O. Box 30552, Nairobi, Kenya.

JARQ. Special issue on Nitrogen Nutrition of Upland Crops, Ornamental Plants, Vegetable and Fruit Trees - A Review on 15N Studies in Japan. Japan Agricultural Research Quarterly, Vol.25 No.2, October 1991. ISSN 0021-3551.

In recent years, there has been an increasing global interest in fertilizer application from the viewpoint not only of effective and efficient use of agricultural resources, but also of environmental protection, aiming at the development of sustainable agriculture. Towards this end, full understanding on behaviour of nutrients, especially nitrogen originating from atmosphere, soil and fertilizer applied, is required. Those data and information contained in the present issue are expected to make contributions along this line. Some papers deal with comparative advantages of the selected 15N trace methods.

Price: free of charge.

Requests to: Tropical Agriculture Research Center, Ministry of Agriculture, Forestry and Fisheries, Tsukuba, Ibaraki, 305 Japan.

The Disappearing Tropical Forests. IHP Humid Tropics Programme Series No. 1. UNESCO, Paris, 1991, 49p.

A transformation of the landscapes is now underway in many of the earth's tropical regions. Long-established tropical forests are vanishing as various exploitation or conversion scenarios are devised and implemented. However, in doing so, we may be fatally ignoring the interconnectedness of our water supply, our vegetation, and our biological processes. Changing from a tree-covered land surface to a pasture or urban landscape will affect the solar radiation input/output balance. Changing this balance in turn will modify the atmospheric recycling of the water which the solar heat has evaporated from the vegetation or land and water surfaces. Alterations in the atmospheric recycling of the water will then also affect the movement of water in the streams, in the water bodies and eventually, in the underground aquifers.

While the perspective of this document is generally from that of water resources, it is evident that all aspects of the land, water, and air interact. It therefore has been felt to be necessary to take a broad view of the problems of vanishing tropical forests. And while maintaining scientific integrity, the document is written in a popularized style for an audience of non-technically educated persons.

Price: single copies available free of charge

Requests to: The Director, Division of Water Sciences, Unesco, 7 place de Fontenoy, 75700 Paris, France.

Management and Restoration of Human-Impacted Resources: approaches to ecosystem rehabilitation. MAB Digest No.5. K. Schreckenber, M. Hadley and M.I. Dyer, editors. Unesco, Paris, 1990, 90p.

This is the second of four new research orientations within the Man and the Biosphere (MAB) Programme of Unesco. It arose out of the recognition that most ecosystems are affected by humans in one way or another, and that human impact on ecosystems often has far-reaching and even global implications. This report confines itself to looking at 'negative' human impact on natural resources. Rehabilitation is used as the generic term to describe a management strategy designed to arrest the degradation of landscapes and make them more useful. Within this strategy, restoration and redevelopment have been defined as two tactics to return degraded land either to its original condition, or to some other more useful condition, respectively.

Within this orientation, it is suggested that the following important themes need immediate attention: (1) The ecological processes; (2) the socio-economic perspectives and dimensions; and (3) the ingredients and strategies for ecosystem rehabilitation.

Orders to: MAB-Unesco, 7 place de Fontenoy, 75700 Paris, France.

The Ecology of Areas with Serpentinized Rocks: A World View. Geobotany 17. B.A. Roberts and J. Proctor, editors. Kluwer Academic Publishers, Dordrecht, London, 1992, 427p. ISBN 0-7923-0922-7. Hardbound.

Serpentinized ultramafic rocks occur throughout the world and are conspicuous for their impoverished but botanically interesting floras. There is often a sharp contrast with the floras of adjacent areas and serpentinized ultramafic soils sometimes contain endemic, rare and unusual races of plants. The soils in serpentinized ultramafics often contain toxic quantities of magnesium and also have substantial concentrations of chromium, cobalt and nickel. They are nutritionally unbalanced for most plants, have varied textures and in alpine or northern areas cryoturbation is common as a result of the sparse ground cover.

Agriculturally, serpentinized ultramafic soils pose many problems, but it is perhaps to the biologist that they present the greatest challenge. Their study involves the fundamental aspects of animal and plant biochemistry, ecology, genetics, geography and physiology.

This book draws together contributions from several of the world's leading authorities on the vegetation of serpentinized ultramafic soils and incorporates much previously unpublished information as well as references to literature which remains little known.

Price: Dfl 350, US\$ 229, UK£ 120

Orders to: see below.

Biology of Cladocera. Developments in Hydrobiology 71. V. Kořínek and D.G. Frey, editors. Kluwer Academic Publishers, Dordrecht, London, 1991, x + 323p. ISBN 0-7923-1460-3. Hardbound.

This volume contains most of the papers presented at the Second International Symposium on Cladocera. They cover the morphology and taxonomy of the Cladocera, evolution, genetic diversity and natural hybridization, population growth, mortality, and other dynamics, competition between species, predation, life histories in specific habitats, and interpretation of past conditions in lakes and their watersheds from the microfossils of Cladocera recovered from sediments. Cladocera occur either swimming in open water (zooplankton) or else associated with various types of substrate on the bottom (meiobenthos). They constitute one of the prime mechanisms for energy transfer from algae and organic detritus to larger invertebrates and fishes. This ecosystem function and their overall abundance make them one of the most important groups of animals in fresh water.

Price: Dfl 275, US\$ 147, UK£ 93.

Orders to: see below.

Ecology and Control of the Natural Environment. Yu.A. Izrael'. Kluwer Academic Publishers, Dordrecht, Boston, 1992, x + 420p. ISBN 0-7923-1197-3. Hardbound.

The last two decades showed an introduction of worldwide threats to the biosphere and human health due to the effects of anthropogenic activities. This book pays major attention to ecological and geophysical aspects of controlling the natural environment. The scientific basis of observations, assessment and forecasting of this natural environment are treated extensively. Methods of ecological and climatic monitoring are presented and their realization in several countries are discussed. Analysis of possible climatic changes, the ozone-layer problems, the polluting of the oceans, acid rain and the aftermath of the Chernobyl accident are concrete examples presented.

Price: Dfl 320, US\$ 177, UK£ 107.

Orders to: In U.S.A. and Canada: Kluwer Academic Publishers, 101 Philip Drive, Norwell, MA 02061, U.S.A.

Elsewhere: Kluwer Academic Publ. Group, P.O. Box 322, 3300 AH Dordrecht, The Netherlands.

Mapping Critical Loads. H. Sverdrup, W. de Vries and A. Henriksen. Nordic Council of Ministers, Copenhagen, 1990, 124p. ISBN 87-7303-501-7 (Denmark), 91-7996-280-7 (Sweden). Paperback.

This book outlines the step-by-step procedure for mapping critical loads of acid deposition to forest soils, streams and lakes in a country. Two basic critical loads calculation methods are explained, the Mass Balance Method for forest soils, streams, lakes and groundwater and the Henriksen method for lakes. Advice is given with respect to computer models selection, data collection schemes and mapping strategies, as well as criteria on which the critical load values must be based. It also explains some of the models available for dynamic assessments using complex integrated acidification models, and the advantages and problems involved in using dynamic models.

Orders to: Nordic Council of Ministers, Store Strandstræde 18, DK-1255 Copenhagen K, Denmark.

Ecosystem Experiments. SCOPE 45. H.A. Mooney, E. Medina, D.W. Schindler, E.D. Schulze and B.H. Walker, editors. John Wiley & Sons, New York, Chichester, 1991, xxvi + 268p. ISBN 0-471-92926-3. Hardcover.

Predicting the consequences of ecosystem changes is a formidable challenge. Historical information does not provide all the answers and simulation models, although enormously revealing, may be misleading. A third approach is experimental manipulation of whole ecosystems. Such experiments can tell us how whole systems, as well as their components, will

respond to change both in the short and long term, as well as providing direct tests for simulation models.

The objective of this volume is to explore the potential of ecosystem experimentation as a tool to understanding and predicting more precisely the consequences of our changing biosphere. A broad view is taken of the problem by first examining what has been learnt from 'natural' experiments as well as large-scale inadvertent ecosystem perturbations induced by human action.

This book reviews past work as well as proposing priorities for future research for the study of both terrestrial and aquatic ecosystems utilizing experimental approaches.

Price: UK£ 60

Orders to: see below.

Long-term Ecological Research. An International Perspective. SCOPE 47. P.G. Risser, editor. John Wiley & Sons, New York, Chichester, 1991, xvi + 294p. ISBN 0-471-93005-9. Hardcover.

The book reviews important long-term ecological research programmes in several countries throughout the world and identifies problems associated with changing global environments. The chapters both describe and analyze successful research programmes in various ecosystems, including temperate forests, temperate and tropical grasslands, arid steppes, deserts and aquatic systems from countries such as Australia, Canada, England, Germany, France, Kenya, Scotland and the United States. In each case, the characteristics that make the programmes successful are evaluated. Other topics such as administrative structure, role of sites, conceptual design, field management techniques and modelling in the context of long-term ecological research are also discussed.

The volume then describes specific future ecological questions that can only be answered by long-term studies and proposes the necessary organizational structure and communication networks required for multi-national, long-term ecological research programmes.

Price: UK£ 69

Orders to: see below.

Lowland Floodplain Rivers. Geomorphological Perspectives. P.A. Carling and G.E. Petts, editors. John Wiley & Sons, New York, Chichester, 1992, xv + 302p. ISBN 0-471-93119-5. Hardcover.

One of the evident trends in fluvial research in recent years is an emphasis on the broader implications of natural river channel adjustments and the longer-term geomorphological, social and ecological consequences of major engineering works and land-use change. Within the remit of planning authorities, this concern now focuses on the concept of the 'river corridor'. Not only is the wetted section of the river itself included and considered in the concept, but also the riparian zone, the floodplain, the ecosystems associated with these environments and the socioeconomic infrastructure developed by communities throughout history. The river corridor is consequently a palimpsest of fragile and fragmentary linear zones recording the history of interactions with the main river channel. Outwith the river channel, the primary geomorphological component of this patchwork is the floodplain; a structural complex influenced to a greater or lesser extent by flood inundation and groundwater fluctuations as well as by channel migration. It is proper, therefore, to consider how river channels interact with floodplain environments and this collection of essays is designed to reflect the holistic nature of the river valley, to shift attention away from the river bed per se and to consider the data requirements needed to better model river-floodplain history.

Orders to: see below.

Soil Laboratory Testing. Vol.1: Soil classification and compaction tests. 2nd edition. K.H. Head. Pentech Press, London, 1992, xi + 388p. ISBN 0-7273-1318-5.

This revised edition takes into account the changes and additions to BS 1377 brought about by the publication of the 1990 revision of that standard and some subsequent amendments. Much

new material has been added, including references to namas requirements for calibration and tests introduced into the new British Standard such as those related to the Moisture Condition Value. For the benefit of users of ASTM Standards, the requirements of the latest available ASTM Standards have been covered more extensively than in the first edition.

This first volume covers the basic tests for soil classification and compaction. Each test is broken down into simple stages and is described in step-by-step form. Some of the more complex procedures are illustrated by flow diagrams. Many numerical examples are given, to illustrate the methods of calculation. Typical graphical results are shown and the reporting of data is explained. Also included are notes on general laboratory equipment, good techniques and safety in the laboratory.

Price: UK£ 42.50

Orders to: John Wiley & Sons, 605 Third Avenue, New York NY 10158-0012, U.S.A. or: John Wiley & Sons, Baffins Lane, Chichester, West Sussex PO19 1UD, England.

Global Development and the Environment. Perspectives on Sustainability. J. Darmstadter, editor. Resources for the Future, Washington, 1992. xii + 91p. ISBN 0-915707-62-4. Paperback.

Whatever explicit and effective commitments - to control greenhouse gases that threaten global warming, for example - are negotiated at UNCED, profound problems relating to the linked pursuit of environmental, natural resource, and economic objectives are certain to survive the two-week meeting of government leaders, technical experts, and representatives of environmental constituencies. To be sure, participants may well assert that the goals of environmental protection, natural resource adequacy, and economic growth are compatible. But a probing of the question of the sustainability for development inspires less confidence that potential problems and conflicts in the pursuit of these goals are fully appreciated in the international community, much less that the consensus needed to easily achieve the goals will be forthcoming.

In this book, researchers examine some of the enduring issues, whether or not officially under consideration at the conference or raised there informally, that cannot be ignored in any attempt to pursue aspirations concerning the environment and development. The lasting value of UNCED may depend on the extent to which its diverse participants couple political rhetoric-obligatory at such events- with willingness to confront these difficult issues once this 'earth summit' fades into history.

Price: \$ 9.95, + \$ 3.- for postage/handling.

Orders to: Resources for the Future, Customer Services, P.O. Box 4852, Hampden Station, Baltimore, MD 21211, U.S.A.

Time in Geographic Information Systems. G. Langran. Taylor & Francis, London, Washington D.C., 1992, xi + 189p. ISBN 0-7484-0059-1. Paperback.

In the developing field of geographic information systems, there is a compelling need to describe spatial change over time; in other words, to design a temporal GIS. This book examines the conceptual, logical, and physical design of such a capability. It provides a broad survey of research on spatio-temporality, the philosophy of time, temporal databases, and spatial data structuring. With a comprehensive framework and a good collection of figures to aid the visualization of abstract concepts, time and spatial data structuring is investigated in depth. Throughout, the literature concerning time in information processing is reviewed and the discussions are expanded to cover implementation issues such as clustering, quality control, and volume control.

Price: £ 19.50

Orders to: Taylor & Francis, Rankine Road, Basingstoke, Hants. RG24 0PR, United Kingdom.

Solving the Global Change Puzzle. A U.S. Strategy for Managing Data and Information. National Academy Press, Washington, D.C., 1991, x + 52p. Paperback.

This report describes data and information management needs, reviews the status of existing components, gives a vision of how a global change data and information system might evolve, and proposes a strategy for future actions. That strategy is to build on the successes of the current

data centers' infrastructure to achieve a data and information system in support of the U.S. Global Change Research Program.

A global change data and information system should be based on simple principles that result from an analysis of existing data center activities. Successful data systems or centers are those that combine data management with scientific use of the data. Users contribute to the development of the data system and provide ongoing feedback. A successful system involves the scientific community at all stages of development and operation.

This report concludes that scientific community support for and participation in a global change data and information system are critical. Without active scientific support, any data and information system is unlikely to meet the needs of the mentioned program.

Orders to: Committee on Geophysical Data, National Academy of Science, 2101 Constitution Avenue N.W., Washington, D.C. 20418, U.S.A.

Proposals for the Classification, Description and Mapping of Soil in Urban Areas. J.M. Hollis. English Nature, 1992, 41p. + 2 maps. ISBN 1-85716-042-8. Paperback.

Soils in rural areas are seen as obvious natural resources in which agricultural, horticultural and forestry crops are grown. Although these soils have been studied intensively and extensively during the past 100 years, soils in urban areas have been almost totally ignored. However, many problems have emerged in recent years which caused the Nature Conservancy Council and the British Society of Soil Science to publish "Soils in the Urban Environment" which drew attention to the physical, chemical and biological problems encountered in urban soils. As a result of that book, English Nature commissioned the Soil Survey and Land Research Centre at Silsoe to investigate the problems encountered in the classification of soils in urban areas.

The proposal builds on the classification system of the Soil Survey of England and Wales. It modifies the former major soil group of Man-made soils, re-naming it Made-ground soils, and a new major soil group called Man-modified soils is introduced. Made-ground Soils include Raw-toxic, Raw, Shallow, Dense, Well-aerated, Dense, seasonally wet, and Permeable, seasonally wet soil groups. Each group has between six and eight subgroups. The new major soil group of Man-modified soils includes *Truncated, Disturbed, Buried and Deepened soil groups* and is intended to include those soils of urban areas which are thinly buried or contaminated by human activity.

Price: £ 7.00

Orders to: English Nature, Dept. ENM, Northminster House, Peterborough PE1 1UA, United Kingdom. E.M. Bridges, Wageningen, the Netherlands

Manual of Methods for Mountain Transect Studies. T. van der Hammen, D. Mueller-Dombois and M.A. Little, editors. International Union of Biological Sciences, 1989, ii + 66p. ISBN 92-9046-0733. Paperback.

The objective of this manual is to develop the basis for a comparative analysis scheme. This is done by outlining two successive approaches. The first relates to a minimum program which is based on an analysis and subsequent synthesis of already existing information combined with a thorough reconnaissance survey in the field. The second relates to an advanced program which is based on formalized field sampling. The advanced program is designed to answer questions and hypotheses that relate to the two main premises 1) a comparison of tropical mountain systems in different parts of the world and 2) comparisons between cultivated and natural mountain landscapes in the tropics. Since this is primarily a biological program, the landscape and ecosystem elements emphasized include the vegetation, soils, selected fauna, climatic and human population parameters.

Orders to: IUBS, 51 Boulevard de Montmorency, 75016 Paris, France.

Semi-arid Indian Agriculture. Land, water and crop management in Southern India. Bulletin 316. M. Put and M.P. van Dijk. Royal Tropical Institute, Amsterdam, 1989, 48p. ISBN 90-6832-800-X. Paperback.

Factors such as variable climate and soil quality, high population pressure, traditional

agricultural technologies and limited access to capital together result in production figures for dryland crops in semi-arid India which are relatively low. As a result, most households do not produce sufficient grain to feed their own members, and many villages are not able to produce enough grain to supply their inhabitants. At the macro-level, India is confronted with stagnating production of important dryland crops like sorghum, millet, pulses and oilseeds.

New technologies for various agro-ecological zones were developed since the 1970's, such as soil conservation measures, measures to stimulate water infiltration, to improve crop management, and irrigation systems.

This study aims to bridge the gap between studies concentrating on agrotechnical research and village-level studies; it describes the present situation in the agricultural sector, summarizes research dealing with methods of increasing agricultural productivity, investigates at micro level whether farmers adopt the new technologies suggested and highlights problems connected with their acceptance.

Price: Dfl 20.

Orders to: see below.

Mali-Sud. D'un aménagement anti-érosif des champs à la gestion de l'espace rural. Bulletin 317. J. Hijkoop et P. van der Poel. Institut Royal des Tropiques, Amsterdam, 1989, 52p. ISBN 90-6832-801-8. Cartoné.

Le présent document traite des résultats des recherches menées par la Division de Recherche sur les Systèmes de Production Rurale (drspr), Volet Fonsébougou, dans le domaine de la conservation des eaux et des sols. L'approche de vulgarisation du Projet Lutte Anti-Erosive (plac) dans la zone Mali-Sud et ses résultats préliminaires sont évalués, et des recommandations pour une évolution future sont élaborées.

La présente étude est exécuté conjointement par l'Institut d'Economie Rurale de Bamako et l'Institut Royal des Tropiques d'Amsterdam.

Prix: Dfl 20.

Commandes à: voir ci-dessous.

Soil Mining. An unseen contributor to farm income in southern Mali. Bulletin 325. F. van der Pol. Royal Tropical Institute, Amsterdam, 1992, 48p. ISBN 90-6832-807-7. Paperback.

This bulletin examines the problem of soil mining: the process that takes place when fields under cultivation give up more nutrients than they gain, so that the nutrient reserves of the soil are depleted. Such depletion of plant nutrients is an important underlying cause of soil degradation in many parts of Africa, destroying the long term productive capacity of agricultural land. Because this type of mining is unseen, the resources thus lost are rarely taken into account. While the methods used are equally applicable to other areas, the case of southern Mali is considered here. As much as 40% of the income generated by farming in this region appears to be based on soil mining.

Among the policy implications of this study is a need for increased investment in soil fertility. For such investments to be effective, however, farmers will need additional training. They are responsible for the field-level decisions on fertilizer doses and timing that determine the impact of these investments.

Price: Dfl 15.

Orders to: KIT Publishers, Mauritskade 63, 1092 AD Amsterdam, the Netherlands.

Proceedings of the International Symposium on Impacts of Salinization and Acidification on Terrestrial Ecosystem and its Rehabilitation. N. Ogura, editor. Tokyo University of Agriculture and Technology, 1992, v + 243p. Paperback.

This document constitutes the results of this symposium, held in Tokyo in September 1991, and contains opening addresses, keynote lectures and scientific papers presented around two major issues: (1) Land deterioration by salinization, and (2) Impact of acidification on terrestrial ecosystems.

Price: US\$ 20 (including postage)

Orders to: Tokyo University of Agriculture and Technology, Fuchu, Tokyo 183, Japan.

Acid Rain and the Environment 1988-1991. A selected bibliography. Compiled by L. Grayson. The British Library and Technical Communications, Letchworth, 1991, iv + 217p. ISBN 0-946655-42-1. Paperback.

This is the third volume in the series of bibliographies covering international research on acid rain which now covers the period 1980 to the present day. The bibliography includes 934 references to international research on the subject and the opportunity has been taken in this volume to broaden the coverage to include references to the effects of acid rain on birds, mammals and insects; ground water and marine waters and acidification counter measures.

Research programmes on acid rain continue to multiply and expand and no bibliography can hope to include all relevant references to their work. However, all documents cited in this volume are available for consultation through the Document Supply Centre of the British Library. The bibliography is fully indexed and scanning of relevant literature has been carried out up to the middle of 1991.

Research scientists and the general public alike will find this book of considerable value, not least in suggesting aspects of the wider problem of acid rain which they might otherwise have overlooked. The entries span the whole range of possible interests, from the statement of the central issue and the controversy which surrounds it, the research that has been done, and the effects of the acidity on the environment, to the strategies for the mitigation of these effects.

Price: £ 32 (in U.K.) £ 34 (elsewhere)

Orders to: Technical Communications Publ. Ltd, 100 High Avenue, Letchworth, Herts. SG6 3RR, England.

Soil Constraints on Sustainable Plant Production in the Tropics. TARS No. 24. Tropical Agriculture Research Center, Ibaraki, 1991, vi + 217p. ISSN 0388-9386. Paperback.

On the occasion of the 14th ISSS Congress in Kyoto, the Tropical Agriculture Research Center organized a Symposium, the proceedings of which were published as an issue in the Tropical Agricultural Research Series.

To promote sustainable plant production it is necessary to evaluate soil constraints and the symposium addressed these issues. A limited number of copies is available free of charge.

Requests to: Tropical Agriculture Research Center, Ministry of Agriculture, Forestry and Fisheries, Tsukuba, Ibaraki, 305, Japan.

TropSoils Bulletins. Soil Management Collaboration Research Support Program, North Carolina State University, Raleigh.

In this series the following publications were published:

90-01: Legume Green Manures; principles for management based on recent research. D.J. Lathwell, 1990, 30p. 91-01: Physical Constraints to Root Growth in Savanna Oxisols. 1991, 28p. 91-02: Toward Sustainable Agriculture in the Humid Tropics. Building on the TropSoils experience in Indonesia. C.J. Pierce Colfer, 1991, 86p.

Requests to: Soil Management Collaboration Research Support Program, Box 7113, North Carolina State University, Raleigh, NC 27695-7113, U.S.A.

**New Publications from FAO/Nouvelles Publications
de la FAO/Neue Veröffentlichungen von FAO**

Guidelines for Land Use Planning. FAO, Rome, 1989, viii + 121p. FAO publ. M/T8517E/1/2.90. Paperback.

These guidelines have been developed as an interdisciplinary practical guide to rural land use planning in developing countries for use within FAO, in field projects and by member governments. The target is graduate professional staff who, although not trained planners, are engaged in land use planning activities.

The principles and methods suggested should provide useful guidance in most circumstances and at various levels of detail. By providing an overview, the publication should prove useful both to those who undertake land use planning and those who commission it or who make use of the resulting plans. These guidelines should also help in the preparation of national guidelines for land use planning which can deal more directly with the specific land use planning problems and opportunities in individual countries.

Orders to: see below.

Land Use Planning Applications. World Soil Resources Report 68. FAO, Rome, 1991, 158 p. ISBN 92-5-103131-2. Paperback.

This volume presents the proceedings of a meeting held in Rome in December 1990 to promote progress in land use planning. Discussions focus on the field applications of the FAO Guidelines for Land Use Planning and the working document Land Evaluation and Farming Systems Analysis for Land Use Planning. Invited papers outline recent experience of land use planning in 16 countries, mostly on FAO projects. Few of these were originally planned on the basis of the Guidelines but pertinent issues were raised and strengths and weaknesses of the Guidelines were highlighted.

The introductory review brings together some of the main themes of informal discussions and relates these to the papers presented to the consultation. The papers are grouped broadly by region, concluding with those concerned with land evaluation and farming systems analysis. Subsequently, working groups discussed amendments to the Guidelines and methods for field testing of planning procedures. The general recommendations of the working groups are recorded at the end of these proceedings.

Orders to: see below

World Soil Resources. An explanatory note on the FAO World Soil Resources Map at 1:25.000.000 scale. World Soil Resource Report 66. FAO, Rome, 1991, 58p. + map. ISBN 2-5-103117-7.

The FAO-Unesco Soil Map of the World produced in the 1970s has provided an acceptable inventory of the nature and distribution of soils throughout the world. Its production also encouraged soil scientists to improve our knowledge of soils, to the extent that a revision of the original map and reports is justified. A revised legend has already been developed and is being used in the initial stages of updating the digitized soil map of the world in the FAO geographical information system (GIS).

The map presented here also forms part of the GIS and can be overlaid on equivalent small-scale maps to allow interpretations of the relationships between soil conditions and other features, such as world climate, present land use and global soil degradation. In all, the colour maps shows the distribution of 23 soil associations.

Orders to: FAO sales agents, or: Distribution and Sales Section, FAO, Via delle Terme di Caracalla, 00100 Rome, Italy.

Change: Threat or Opportunity for Human Progress? 5 volumes. Ü. Kirdar, editor. United Nations, New York, 1992. Paperback.

Vol.1: Political Change, 329p. ISBN 92-1-126024-8 - examines the easing of East-West tension and the end of the cold war, as well as the growing convergence of views on effective approaches to economic and social development.

Vol.2: Economic Change, 356p. ISBN 92-1-126025-6 - shows how, the decade of the 1980s represents crisis, depression and lost opportunities for many developing countries. Throughout the developing world, the dismal GNP growth rate, the slow-down in external financing, heavy debt-servicing and the depreciation in external trade have resulted in a widening gap between developed and developing countries, engendering political and economic tension. To reactivate the development process, fully-fledged global action is urgently needed, including a solution to the debt crisis.

Vol.3: Market Change, 161p. ISBN 92-1-126026-4 - examines how financial and securities markets are undergoing fundamental transformations: borrowers are no longer confined to domestic markets; deregulation has promoted new financial products; technology has cut communication costs; and world financial exchanges outweigh trade in goods by 20 to 1.

Vol.4: Social Change, 145p. ISBN 92-1-126027-2 - examines the changes occurring in the human dimension of development. Rapid population growth and changing technology will have a very important impact on human development.

Vol.5: Ecological Change, 218p. ISBN 92-1-126028-0 - examines the changing ecological balance of the world, its effect on human prosperity and how its protection is one of the most important global development challenges of our time. The problems caused by global warming, changing climate and environmental degradation will have both short- and long-term effects.

Price: US\$ 75

Orders to: United Nations, sales agents around the world, or: United Nations, Sales Unit, Palais des Nations, CH- 1211 Genève 10, Switzerland.

Soil Biochemistry. Vol. 7. G. Stotzky, J.-M. Bollag, editors. Marcel Dekker, New York, 1992, x + 418p. ISBN. 0-8247-8575-4. Hardbound.

This reference considers the essential role of biochemical processes in the soil environment - emphasizing the activity of microorganisms in soil. Offering new insights into basic biological, chemical, and physical processes, the book also stresses the potential application of biochemical processes in soil to environmental biotechnology.

This volume highlights applications of biotechnology, molecular biology, and microbial genetics to soil biology and biochemistry; advances in understanding the biochemistry of sulphur cycling; processes of humification; the extraction of soil enzymes; interactions between soil minerals and microorganisms; the formation of desert varnishes; the role of nematophagous fungi in soil; the movement of microorganisms in soil; new techniques for the biochemical analysis of biomass in soil; community structure and microbial activity in soil; and the application of molecular techniques to soil microbial ecology and biotechnology.

Price: US\$ 150 (in U.S. and Canada); US\$ 172.50 (elsewhere)

Orders to: Marcel Dekker, Inc., 270 Madison Avenue, New York, NY 10016, U.S.A.

Découvrir le Sol. A. Ruellan. D'après le film "Terra pra Viver" de E. Ewald, S. Nicola et A. Ruellan. CNEARC, Montpellier, 1990, 45p. ISBN 2-9504942-0-X. Cartonné.

Descobri o Solo. A. Ruellan. A partir do filme "Terra pra Viver" de E. Ewald, S. Nicola et A. Ruellan. CNEARC, Montpellier, 1990, 45p. ISBN 2-9504942-1-8.

Les progrès récents de la pédologie permettent d'envisager de nouvelles démarches pour faire connaître les sols: il est en particulier maintenant possible de mettre à la disposition de tous une approche de l'observation des sols, approche qui permet non seulement de découvrir, de regarder ce que sont les sols, mais aussi de comprendre comment vivent ces sols et comment ces sols pourraient être à la fois mieux utilisés et mieux conservés: le sol est une ressource renouvelable, mais dont le renouvellement dépend des conditions de son utilisation.

Le présent document a pour objectif de reprendre et de détailler les connaissances apportées par le film en matière de sol. Il est, pour ceux qui ont vu le film, la fois une mémoire et un outil pour aller plus loin dans la découverte et la lecture des sols. (voir annonce du film Bull. 75 page 57).

Prix: FF 30 ou US\$ 6

Commandes à: CNEARC, B.P. 5098, 34033 Montpellier Cedex 01, France.

Trees of Life: Saving tropical forests and their biological wealth. K. Miller and L. Tanglely. World Resources Institute, Baltimore, 1991, xxi + 217p. ISBN 0-8070-8505-7. Paperback.

This book tells the history of human assaults on the world's deforestation 'hotspots', showing how poverty, population growth, and short-sighted government policies are accelerating tropical destruction. It explains what deforestation is doing to the global environment and why rainforest preservation is vital to human welfare around the world. With special sections on 'what you can do' and on U.S. old-growth forests, plus a complete glossary and listing of additional information resources, this handbook written for general audiences gives full coverage of the tragic story of global deforestation and examines the costs and consequences - human, economic, and ecological.

Price: US\$ 9.95

Orders to: see below.

Transforming Technology. An agenda for environmentally sustainable growth in the 21st century. F. Heaton, R. Repetto and R. Sobin. World Resources Institute, Baltimore, 1991, x + 39p. ISBN 0-915825-69-4. Paperback.

Technology has contributed more than any other factor to increases in wealth and productivity. If channelled appropriately in the future, it could hold the key to environmental sustainability as well. This report explores the extraordinarily rich potential for new technologies to resolve environmental and economic problems. It argues that what is required to achieve this potential is not more technological know-how but new ways of thinking and new policies and practices, particularly in the areas of environmental regulation, economic and technology policies, international trade, corporate management, and education.

Price: US\$ 12.95

Orders to: WRI Publications, P.O.Box 4852, Hampden Station, Baltimore, MD 21211, U.S.A.

Challenges in Dryland Agriculture. A global perspective. Texas Agricultural Experimental Station, 1989, xiii + 965p. Hardbound.

This is the Proceedings of the International Conference on Dryland Farming held in the U.S.A. in 1988. The purpose of the conference was to evaluate past progress in dryland farming, identify constraints, propose methods and technologies needed to alleviate those constraints, propose policies and programs for more effective technology transfer, and identify research needs and priorities for dryland farming.

This volume contains the papers presented at the Conference along with rapporteurs' reports pertaining to the various sessions of the Conference. Also included are the Recommendations of the Conference.

Orders to: Texas A&M University, Dept. of Agricultural Communications, Reed McDonald Building, College Station, Texas 77843-2112, U.S.A.

Soil Fertility and Fertilizer Management in Semiarid Tropical India. C. Bruce Christianson, editor. International Fertilizer Development Center, Muscle Shoals, 1989, v + 153p. Paperback.

These proceedings contain the papers presented during a colloquium held in October 1988, as well as the summaries of the discussions. This colloquium was organized to bring together scientists having firsthand knowledge and understanding of the problems related to soil fertility in the Indian semiarid tropics. It provided a forum in which agricultural scientists could share knowledge, explore possibilities for increasing fertilizer use efficiency in India, and establish research priorities. By approaching the problems of sustainable agriculture from a variety of perspectives, the proceedings should become an important bibliographic resource for future research work in India.

Price: US\$ 30

Orders to: IFDC, Purchasing Department, P.O. Box 2040, Muscle Shoals, AL 35662, U.S.A.

Rice Farming System, New Directions. Proceedings of an international Symposium, Sakha,

Egypt, January-February 1987. International Rice Research Institute, Manila, 1989, 375p. ISBN 971-104-211-8.

The global family of rice research institutes and scientists dedicated to improving the productivity, profitability, stability, and sustainability of rice farming systems is strengthening and growing. A major indicator of that increasing capability is the establishment of new rice research facilities in many countries, e.g. the Sakha Rice Research Center in Kafr El-Sheikh, Egypt. The symposium opened new opportunities for collaboration with Egypt, not only by international institutes, but also by other national programs in the region.

Orders to: see below.

Progress in Irrigated Rice Research. International Rice Research Institute, Manila, 1989, 390p. ISBN 971-104-184-7. Paperback.

Irrigated rice is the most widely practiced culture, covers the largest area, and produces the highest yields. The 50% of the world's ricelands that are irrigated produce more than 70% of the world's rice.

Papers in the volume focus on the global rice situation, physiological aspects of the yielding ability of irrigated rice, pest management, and nutrient and water management. Also included are papers on farming systems, farm machinery, postharvest management, and innovative breeding techniques made possible by recent progress in hybrid rice breeding and biotechnology.

This volume contains selected papers and abstracts from the International Rice Research Conference, held in Hangzhou in September 1987.

Price: HDC: US\$ 16; LDC: US\$ 4.25 (plus US\$ 2 for surface mail)

Orders to: IRRI, P.O. Box 933, Manila, Philippines.

Agricultural History, Vol.3, No.2, 1989. Special symposium issue on Climate, Agriculture and History. D.C. Smith, editor. University of California Press. ISSN 0002-1482. Paperback.

This volume contains an opening paper, four groups of papers, and a closing paper designed to bring various elements together in the study of a single area. The opening paper is a bibliographic essay on the "state of knowledge" about North American climate history, and suggestions about new work underway that is needed to extend our understanding of these matters.

The first section indicates how the National Agricultural Library provides a central role in this work, and documents the history of the USDA in weather and climate affairs as they relate to farmers and farming. The second section provides a range of research results in which climate materials are used to discuss agricultural history, as it applies to crops over time and in regions of new settlement. These papers also describe different areas of the world - northern Italy, England, and eastern Canada. The third section deals with ways that climate data helps broaden understanding in more general areas of agricultural history research. Farming failures illuminate this work as much as success stories. Some of the papers also demonstrate how farmers could have used climate data, if they had been available, to aid their decision making. Others suggest that growing climate knowledge forced new decisions. The fourth section consists of specific case studies which use climate studies to illuminate historic events. The final papers seeks to integrate a number of areas of research into specific agricultural history issues.

The present papers show of how an analysis of climate, climate variability, and climate change can aid historians, geographers, and others to learn more about their subjects.

Orders to: University of California Press, Berkeley, CA 94720, U.S.A.

Soil Erosion Protection Measures in Europe. Soil Technology Series 1. U. Schwertmann, R.J. Rickson and K. Auerswald, editors. Commission of the European Communities, 1989, 216p. ISBN 3-923381-16-6. Hardbound.

The aim of the workshop held at Freising-Weihenstephan in May 1988, was to focus on protection measures against soil loss and offsite effects suitable for the wide range of soil and agricultural conditions in the various European countries. This volume contains 20 papers presented during the workshop including two papers which report the work demonstrated during

one of the field trips. The publication is meant to reflect the variety of problems and efforts to combat soil loss in the great diversity of European agroecosystems, and to encourage and strengthen European cooperation in this field.

Orders to: Catena Verlag, Brockenblick 8, W-3302 Cremlingen-Destedt, Germany; or: Catena Verlag, P.O.Box 368, Lawrence, Kansas 6044, U.S.A.

Carbon Dioxide and Global Change: Earth in Transition. Sh.B. Idso. Institute for Biospheric Research, Tempe, 1989, iii + 292p. ISBN 0-9623489-1-0. Paperback.

A probing analysis and thorough review of the many potential consequences of the rapidly rising CO₂ content of the Earth's atmosphere. Covering both the physical (climatic) and biological effects of atmospheric CO₂ enrichment, the book presents a broad overview of the many interrelated aspects of this complex and demanding subject. A supplement for college courses concerned with the environment and for scientists involved in all aspects of CO₂ research.

Special emphasis for the search for evidence of global warming (the greenhouse effect) and global vegetative stimulation (the other "greenhouse effect"). Covers the pros and cons of all issues related to these phenomena and presents the author's best estimate of where the world is headed as a result of mankind's "great geophysical experiment".

Price: US\$ 19.95 plus postage.

Orders to: Institute for Biospheric research, 631 E. Laguna Dr., Tempe, AZ 85282, U.S.A.

Training Resource Book for Agro-Ecosystem Mapping. C. Lightfoot, N. Axinn, P. Singh, A. Bottrall and G. Conway, editors. International Rice Research Institute, Manila, 1989, 55p. Paperback.

This training resource book is made for researchers wishing to learn and teach the essentials of Agro-Ecosystem Mapping. While it is intended to assist farming systems researchers in Eastern India share agro-ecological mapping skills, others may find it a useful training resource.

The volume focus on essential maps and transects. The cases show what is possible in a one-day field visit and not a longer more detailed analysis of agro-ecosystems. The approach combines process documentation, case studies, training templates, and further readings.

Price: US\$ 7.50 (plus postage and packing)

Orders to: ICLARM, MC P.O. Box 1501, Makati, Metro Manila 1299, Philippines.

Changing the Face of the Earth: Culture, Environment, History. I.G. Simmons. Basil Blackwell, Oxford, New York, 1989, xiii + 487p. ISBN 0-631-16351-4 (Paperback); 0-631-14049-2 (Hardback).

This is a history of the human impact upon the natural environment of the Earth. It is a compelling story, drawn from work in a wide range of the natural and social sciences. It covers every kind of culture and society, ranges in time from the earliest social groupings to the present, and considers the short- and long-term consequences of current trends.

A key argument of the book, and one that informs its structure, is that access to energy is a crucial influence on the way in which we have used and exploited our natural surroundings. If environmental impacts of the discovery of fire were substantial, and of agriculture dramatic, the effects of industrial and technological change over the last two centuries have been revolutionary.

Exponential growth in the use of fossil fuels and of the human population mean that our own activities now constitute a critical variable in environmental change. The recent history of the interaction between human kind and nature has become different from the past not only in degree but in kind: and there is a mismatch between our ability to affect and to control the natural environment. These issues form the concluding theme of this book.

Price: £ 14.95 (paperback); £45 (hardback).

Orders to: Basil Blackwell Ltd., 108 Cowley Road, Oxford OX4 1JF, United Kingdom.

X-ray Diffraction and the Identification and Analysis of Clay Minerals. D.M. Moore and R.C. Reynolds Jr. Oxford Univ. Press, Oxford and New York, 1989, xvi + 332 p. ISBN 0-19-505170-X.

This book is written for students. It is a combination of a textbook and a lab manual. The language is informal and easy to read with scattered questions integrated in the text. Emphasis is laid on the use of manually operated diffractometers since these are most suitable for instruction and still widely in use. Yet, the book is very comprehensive and up to date with useful references for further reading. The topics treated appear from the list of chapters: 1. Introduction and historical background. 2. The nature and production of X-rays. 3. X-ray diffraction effects. 4. Structure, composition, properties and occurrence of clay minerals. 5. Sample preparation techniques for clay minerals. 6. Identification of individual clay minerals and associated minerals. 7. Identification of mixed-layered clay minerals. 8. Quantitative analysis. Appendix: Modelling one-dimensional X-ray diffraction patterns of clay minerals.

Although we missed a few useful items (e.g. the porous plate technique by suction, the goethite-hematite distinction), the book is a valuable asset for anyone embarking on X-ray diffraction.

Orders to: Oxford University Press, Walton Street, Oxford OX2 6DP, U.K.

L.P. van Reeuwijk, Wageningen, the Netherlands

Hydrous Phyllosilicates (exclusive of micas). Reviews in mineralogy, Vol. 19. S.W. Bailey, editor. Mineralogical Society of America, Washington, 1988, xii + 725p. ISBN 0-939950-23-5.

After Volume 13 of this series which treated the micas, the present voluminous collection of monographs completes the account of knowledge about the layer silicates. It may be considered a planned coincidence that the appearance of this book marked the retirement of Dr. Bailey who contributed so much to the development of clay science. We can be brief about the book: it is simply a must for everyone working in or studying clays.

Orders to: Mineralogical Society of America, 1625 I Street, Suite 414, Washington, DC 20006, U.S.A.

L.P. van Reeuwijk, Wageningen, the Netherlands

Philippines. Environmental and Natural Resource Management Study. The World Bank, Washington, 1989, xxii + 170p. + map. ISBN 0-8213-1272-3. Paperback.

The Philippines faces many environmental problems. Six critical ones are deforestation, soil erosion, shifting natural water systems, the conversion of mangrove swamps to fishponds, the destruction of coral reefs, and the depletion of nearshore fisheries through overfishing and destructive fishing techniques.

This report surveys the extent and rate of the degradation of natural resources in the Philippines. It analyzes the economic and social costs of the country's environmental problems. The government's strategy to improve resource management is outlined.

Price: US\$ 11.95

Orders to: see below.

Land Information and Remote Sensing for Renewable Resource Management in Sub-Saharan Africa. World Bank Technical Paper Number 108. F. Falloux. The World Bank, Washington, 1989, vii + 70p. ISBN 0-8213-1309-6. Paperback.

The countries of Sub-Saharan Africa need accurate, timely information on their land and resources to plan for long-term development and conservation. Much of this information could be obtained cost effectively through aerial and satellite remote sensing.

In many African countries, however, the tools for collecting, analyzing, and managing this information are unavailable or poorly supported. Or, if they are available, they are "supply-

driven" - closely tied to what is available from the commercial or scientific technology suppliers without consideration of the needs of the users.

The report examines a number of problems related to land information, remote sensing, and renewable resource management in many African countries: outdated or nonexistent maps; inadequate geodetic reference systems; unclear land rights; fragmented, poorly coordinated land institutions; insufficient training facilities; difficult access to geographic data; and scarce financial commitments. It includes case studies of land management in Burkina Faso, Cameroon, Madagascar, and Zimbabwe.

Price: US\$ 6.95

Orders to: The World Bank, Publication Department, 1818 H Street, N.W., Washington, DC 20433, U.S.A.

Highland-Lowland Interactions in the Ganges-Brahmaputra River Basin: a review of published literature. ICIMOD Occasional Paper 11. L.A. Bruijnzeel and C.N. Bremmer. International Centre for Integrated Mountain Development, Kathmandu, 1989, ix + 136p. ISBN 981-00-1244-6. Paperback.

The combined basins of the Ganges and Brahmaputra rivers in the northern part of the Indian sub-continent constitute the home of some 400 million people, or about 10% of the world's population. By modern standards most of the population of the region has always been poor, but concern about the diminishing welfare of these people, as a result of environmental degradation, has been growing rapidly during the last decade.

A widely held perception of this environmental degradation involves recent massive deforestation in the uplands as a result of population explosion, leading in turn to catastrophic increases in soil erosion and river sediment loads on the one hand and to greatly increased flooding and siltation in the lowlands, on the other. Despite the fact that this view appeals to logic and conventional wisdom alike, it has been challenged in the past few years. Basically this alternative school of thought stresses that the dramatic geophysical processes, responsible for the very existence of the Himalaya and the plains, are sufficiently impressive and that the effects of the activities of mountain farmers are insignificant in comparison.

The main purpose of the present paper is to shed more light on the above debate by reviewing the evidence with respect to the physical aspects of the matter published to date. The basic question, therefore, is: "What is the role of the forest and land-use in the uplands with respect to flooding, dry-season flows and sedimentation in the lowlands?" And, following immediately: "What downstream benefits can be reasonably expected in this regard from upland reforestation?". By drawing as much as possible on quantitative data actually collected in the region itself, rather than extrapolating results obtained in other (usually less extreme) parts of the world, the authors hope to lift the discussion from the level of empiricism and subjectivity to a more objective presentation of scientifically established facts. The success or failure of such an approach depends to a large extent on the amount and reliability of the information collected.

After discussing the relevant environmental elements, notably geology and geomorphology, climate, soils and vegetation, as well as their interaction, the physical and biological characteristics of the environment are treated in some detail. Since water is the key element linking atmosphere, plants and soils, this is followed by a discussion of regional hydrology. Within the framework thus provided, the specific influences exerted by various land-use types on total and seasonal water yields, surface erosion, mass movement processes and river sediment loads, are dealt with at length. Based on these findings, conclusions are drawn and gaps in our knowledge indicated.

Orders to: ICIMOD, G.P.O. Box 3226, Kathmandu, Nepal.

Here to Stay. CUSO, Ottawa, 1989.

This is a resource kit on environmentally sustainable development. It is designed to help groups and individuals to increase their awareness, develop education programs and become actively involved with these issues. Section I gives an introduction to the kit and provides resources and ideas for leadership and design of educational workshops, and activities and

suggestions for using this kit; Section 2 includes two education workshops on the theme of sustainable development and the environment; one is a roleplay and the other a workshop based on two case studies. Section 3 contains nine overview papers on the theme of environment and development, while Section 4 proposes background information on CUSO's overseas programs and projects related to issues of sustainable development. Section 5 presents annotated information on useful books and other print resources available, and Section 6 gives an annotated listing of readily available audio-visual resources.

Price: US\$ 25

Orders to: DEC Book Distribution, 229 College Street, Toronto, Ontario, Canada M5T 1R4.

Environmental Education in the Primary School. P. Neal and J. Palmer. Basil Blackwell, Oxford, 1990, xiv + 226p. ISBN 0-631-17055-3 (Hardback) 0-631-17056-1 (Paperback).

This book emphasises the importance of making young people aware of the environmental issues and problems they will face in their adult life. It is a guide to the way environmental education may be established in a primary school. It offers practical advice on forming a school policy, assessment and record-keeping, handling out-of-school work and visits. It contains a number of detailed case studies, illustrated with children's work, and an excellent guide to environmental source material.

Orders to: Basil Blackwell Ltd., 108 Cowley Road, Oxford OX4 1JF, U.K.

Remote Sensing of Soils and Vegetation in the USSR. P.J. Curran, G.M. Foody, K.Ya. Kondratyev, V.V. Kozoderov and P.P. Fedchenko. Taylor & Francis, London and New York, 1990, x + 203p. ISBN 0-85066-402-0. Hardbound.

The remote sensing of soils and vegetation is of interest to all users of remotely sensed data, in fields as diverse as atmospheric physics and ecology, especially agriculturalists, geobiologists and researchers in land-use. This book draws together the recent research carried out in these areas, and in particular includes material from the Soviet Union on the applications of remote sensing data to soil vegetation, humus content and crop yields, previously unavailable to researchers in the West.

Price: £ 30

Orders to: Taylor & Francis Ltd., Rankine Road, Basingstoke, Hampshire RG24 0PR, U.K.

Methods for Diagnosing Research System Constraints and Assessing the Impact of Agricultural Research. Vol. I and II. R.G. Echeverría, editor. International Service for National Agricultural Research, 1990. Vol.I: xii + 282p. Vol.II: xi + 250p. Paperback.

The International Service for National Agricultural Research (ISNAR) organized a workshop in July 1988 in New Brunswick. The purpose of the workshop was to provide a forum for discussing the methods of assessing the impact of research and diagnosing constraints on research systems with the goal of developing a consensus on the methodology for both assessment and diagnosis. These volumes contain the proceedings of the workshop.

Volume I includes the papers on diagnosing systems constraints, and Volume II includes those on assessing the impact of agricultural research.

Orders to: ISNAR, P.O. Box 93375, 2509 AJ The Hague, the Netherlands.

Landscapes, Landscape Systems, Soil Use and Conservation in Slovenia. A. Stritar, Ljubljana, 1991, 172p. Hardback.

The author, pedologist and ecologist, developed in the seventies and eighties methods for the evaluation and protection of arable land which were based on the application of pedological, ecological and landscape sciences. These methods were developed for the needs of the Republic of Slovenia. All levels of society have recognised that it is our duty to preserve the environment and thus also the soil for our descendants, to which this book also contributes. The methodological approaches are also of interest for other countries and regions, and is a reference for people involved in the protection and preservation of the soil and the environment in general.

Price: DM 80

Orders to: Mrs. I. Stritar, "krab"eva 6, 61000 Ljubljana, Slovenia.

Terrain Evaluation. 2nd edition. C.W. Mitchell. Longman, Harlow, New York, 1991, xviii + 441p. ISBN 0-582-30122- X. Paperback.

World pressure on land resources and public awareness of the need for environmental conservation and planning, especially in the light of food shortages in many parts of the world, have continuously grown over the last two decades. This second edition takes account of the extensive developments made within the subject over this period and integrates research on both the scientific and the practical aspects of terrain study.

The text has five main sections: (1) Principles of terrain evaluation; (2) Terrain data requirements; (3) Collection and analysis of terrain data; (4) Display, reporting, and mapping of terrain data; and (5) Applications of terrain evaluation. The book is illustrated with maps, diagrams, and photographs. The first edition was published in 1973 and in the present edition, the range of topics covered is increased, notably by including terrain processes and the place of vegetation, and including a wider range of land user interests.

Price: UK£ 15

Orders to: Longman Group, P.O. Box 88, Fourth Avenue, Harlow, Essex CM19 5SR, U.K.

America's Renewable Resources: Historical Trends and Current Challenges. K.D. Frederick and R.A. Sedjo, editors. Resources for the Future, Washington, 1991, xiv + 296p. ISBN 0-915707-61-6 (Paperback), 0-915707-60-8 (cloth).

By recording one country's experience with its vast natural resource base, this book will help to inform the management of future demands on the resource base in the U.S. and throughout the world. The authors focus specifically on renewable resources -water, forests, rangeland, cropland and soils, and wildlife- which possess the capacity to restore themselves after they have been consumed. Because this capacity can be destroyed and the time required for restoration can be very long, a balance in their use is necessary to sustain continued productivity.

The authors trace the history of each resource's use from early colonial times through periods of dramatic changes in its utilization by an expanding, diversifying society. They show unforeseen consequences have forced social institutions into existence and compelled policy makers, especially at the federal level, to deal with problems for which they were largely unprepared. Complicating the effort is the fact that many of these resources are common property, and have been available on a first-come-first-served basis. Competing claims to their use have many times erupted into legal and even physical conflict. A concluding chapter examines the implications of the growing demand for outdoor recreation on these renewable resources.

Price: US\$ 19.95 (paperback), US\$ 34.95 (cloth), + \$ 3 (postage/handling).

Orders to: Resources for the Future, Customer Services, P.O. Box 4852, Hampden Station, Baltimore, MD 21211, U.S.A.

Weathering Soils. Special issue of *Geoderma*, Vol.51 Nos.1-4. Elsevier, Amsterdam, New York, 1991, 299p. ISSN 0016-7061. Paperback.

In accordance with the outline of the Symposium on Weathering Soils at the IGC Congress, Washington, July 1989, the following general topics are covered in this special issue: (a) conceptual models of weathering systems, (b) field studies related to climatic zones, and (c) Quaternary pedology and geologic applications of pedologic information.

Orders to: in the USA and Canada: Elsevier Science Publishing Co. Inc., P.O.Box 882, Madison Square Station, New York NY 10159, USA; Elsewhere: Elsevier Science Publishers, P.O.Box 211, 1000 AE Amsterdam, the Netherlands.

Crop Production with Saline Water. L.L. Somani. Agro Botanical Publishers, Bikaner, 1991, vii + 308p. ISBN 81- 85031-42-8. Hardback.

The technology and concepts of saline water irrigation are sufficiently developed for sustained production. An attempt has been made in this monograph to consolidate the available information on the origin and nature of salts in irrigation water, effect of saline water on soils and crops, irrigation with saline water, and soil and crop management with saline waters. Efforts

have also been made to focus the scope of research in areas where the existing information is inadequate.

Price: Rs.350.00 / US\$ 85.00

Orders to: Agro Botanical Publishers (India), IVE-176 J.N. Vyas Nagar, Bikaner 334 001, India.

Joining Farmers' Experiments. B. Haverkort, J. van der Kamp and A. Waters-Bayer, editors. Intermediate Technology Publications, London, 1991, x + 269p. ISBN 1-85339-101-8. Paperback.

Many researchers have found that smallholders are often far ahead of them when it comes to developing appropriate technologies for rainfed farming under difficult conditions. This book reports experiences in participatory technology development. It presents a varied collection of reports from researchers and fieldworkers who are supporting the efforts of farmers in that huge research operation commonly known as 'small-scale farming in diverse and risk-prone areas', and linking up experimenting farmers so that they can learn from each other. It is hoped that the experiences reported here of NGOs, development projects, and national and international research centres in Latin America, Africa and Asia will create enthusiasm for others to find site-appropriate ways of supporting farmer experimentation in their own area.

Price: £ 9.95

Orders to: IT Publications, 103-105 Southampton Row, London WC1B 4HH, U.K.

A Primer on Organic-Based Rice Farming. R.K. Pandey. International Rice Research Institute, Manila, 1991, 201p. ISBN 971-104-189-8. Paperback.

Fertilizer is a major input in rice production. As the use of chemical fertilizers has grown, traditionally organic materials such as farmyard manure and green manure crops have been increasingly neglected. The harmful environment effects of heavy and improper chemical use are becoming more evident. Furthermore, the fossil fuels used to produce nitrogen fertilizers are becoming scarcer.

Thus, interest is growing in sustainable farming, using renewable resources that are easily and cheaply available on the farm. Such a system maintains soil fertility as far as possible by the tradition biological means - rotating cereal crops with legumes, recycling manure and other organic wastes, using green manures and combining them with moderate amounts of chemical fertilizers. Research has shown such combinations to be more effective than any single nutrient source in improving soil quality and nutrient use efficiency, and thus, yields. Such a system is also more environmentally sound than one that relies solely on chemical fertilizers. In this book, the author explains the whys and hows of integrating the use of organic and chemical fertilizers, emphasizing the growing of green manure crops.

Price: US\$ 2.75 (plus postage)

Orders to: IRRI, P.O.Box 933, 1099 Manila, Philippines.

Mountain Risk Engineering Handbook, Parts I and II, and Awareness Document. B. Deoja, M. Dhital, B. Thapa and A. Wagner, editors. International Centre for Integrated Mountain Development (ICIMOD), Kathmandu, 1991, 875p. Paperback.

Infrastructural development is no longer the domain of a single discipline, i.e., civil engineering, and mountain infrastructural engineering cannot be separated from a basic knowledge of the geology, environment, and other related disciplines. The Mountain Risk Engineering (MRE) Programme introduced by ICIMOD is a step forward in the process of the integration of various disciplines in order to induce the establishment of sustainable mountain infrastructural institutions.

This handbook is a synthesis of selected practical experiences and up-to-date literature, and its objective is to provide a working basis for training institutions and practising engineers and geologists involved in the development of infrastructure in mountainous areas, in general, and in the mountainous areas of developing countries, in particular.

Orders to: The Publications Unit, ICIMOD, G.P.O.Box 3226, Kathmandu, Nepal.

New Network Papers of the ODI Irrigation Management Network

Issues in the Turnover Programme in Indonesia. Network Paper 10, ODI, 1992, 40p. ISSN 0951-189X. Paperback.

This volume contains two papers: (1) How to turn over irrigation system to farmers? Questions and decisions in Indonesia, and (2) From practice to policy: agency and NGO in Indonesia's programme to turn over small irrigation systems to farmers. *Variation in Interventions, Variation in Results: Assistance to FMIS in Nepal*, G. Shivakoti. Network Paper 11, ODI, 1992, 28p. ISSN 0951-189X. Paperback. *The Equity Impact of Deep Tubewells: Evidence from the Ida Deep Tubewell II Project*, M. Aeron-Thomas. Network Paper 12, ODI, 1992, 18p. ISSN 0951-189X. Paperback.

This paper summarises the results of a study which estimated quantitatively the impact of deep tubewells (DTWs) on income of different farm size groups from crop production, wage employment and DTW 'ownership'. *News from the Field. A collection of short papers.* Network Paper 13, ODI, 1992, 28p. ISSN 0951-189X. Paperback.

This volume includes three papers: (1) Group innovation in utilising land and water resources; (2) Wetland development and management in Malawi; and (3) Aquatic weeds in Sudans' gravity irrigation systems: problems, resolutions and financial and policy implications. *Orders to: The Overseas Development Administration (ODA)*, 94 Victoria Street, London SW1E 5JL, U.K.

New Publications of the Commonwealth Secretariat

Conservation for Sustainable Development. 1987, vi + 70p.

This is a study on the scope for Commonwealth action on soil erosion, desertification and related drought problems in Commonwealth Africa. Chapter 1 contains a survey of the problem both globally and in the context of Commonwealth Africa. Chapter 2 illustrates the scope for Commonwealth action in response to the problem.

Annex 1 outlines in tabular form the situation in African member countries with respect to desertification and the pressure on the agricultural resource base. Annex 2 summarizes the international and donor response to the problem. A number of detailed project proposals are contained in Annex 3.

Problems of Land Degradation in Commonwealth Africa. A study of the scope for Commonwealth action. C. Milner and M.G. Douglas. 1989, vii + 121p.

This is the report of a study of the scope for Commonwealth action on soil erosion, desertification and related drought problems, taking into account previous studies. This detailed study contains much useful information which it is believed would be of interest to all those concerned with the effects of soil erosion, desertification and drought-related problems within Commonwealth Africa.

Integrating Conservation into the Farming System. An Outline for a Training Workshop. 1989, vi + 109p.

Conservation specialists are beginning to recognise that, to be successful, conservation at the smallholder farmer level has to be seen as an integral part of a productive farming system rather than a separate land management practice. To date most farming systems development work is undertaken by teams of agronomists and economists and therefore has tended to concentrate on the agronomic and financial aspects of crop production. Conservation concerns such as erosion control and fertility maintenance and regeneration are only likely to be considered when conservation specialists become integral members of interdisciplinary farming systems teams.

This report presents a model 'Outline Training Workshop Programme' and accompanying teaching notes of training exercises which have been conducted to train potential practitioners

in the use of the "Integrating Conservation into the Farming System" approach. This approach aims to permit an interdisciplinary land use planning team to diagnose the production and land use problems of a group of smallholder farmers and to design improved soil conservation and land use management practices to overcome them.

Conservation for Sustainable Agricultural Development in the Sudano-Sahelian Region of Africa. Vol.1, 1989, Report (168p.); Vol.2, 1990, Technica Papers (vii + 65p.).

This is a report of a consultation on this topic held in the Gambia in May-June 1989. A background research in 1987 revealed a concern, amongst Commonwealth countries, that much of the work carried out in the Francophone region was poorly known in the English-speaking region. It was recognised that the Gambia is in a unique position in having strong links with both groups and bridges the language divide. The Gambia is one of the few Commonwealth countries to have developed a National Plan of Action aimed at reversing the trend of ecological decline.

The present report includes a summary of the main conclusions and recommendations, as well as a summary of all the session of the Consultation.

The second volume of collected papers accompanies the above mentioned volume 1. It brings together the majority of the technical papers presented by the main and support speakers during the working sessions. There is emphasis on the formulation of conservation policies and the need for national plans and strategies which unify government agencies and also embrace non-governmental bodies, education institutions, all rural land users and voluntary groups. The urgency of the task and the essential involvement of people at all stages of the programmes were important themes throughout the contributions.

Land Degradation in Ghana. Produced in cooperation with the University of Ghana, Legon. G. Benneh and G.T. Agyepong. 1990, xii + 183p.

The ten chapters in this volume provide an introduction to the problems and the environment of Ghana with special reference to present land use. The middle chapters of the report describe the effects of land degradation and give an historical dimension to the efforts of governments to prevent land degradation. The authors then describe the present institutional arrangements and resources available in terms of manpower and funding, and there is a final chapter on training and technical assistance. This report will be of interest to planners within Ghana and to many people outside the country who are anxious that the very necessary agricultural and rural development is not damaging the environment.

Integrating Conservation into the Farming System: Land Use Planning for Smallholder Farmers. Concepts and Procedures. M.G. Douglas, 1989, reprinted in 1990, vii + 137p.

This book has been prepared for professionals concerned with the soil and water conservation and land use planning needs of the smallholder farmer. It will be useful to both the natural resource specialists, conventionally responsible for soil conservation and land use planning, as well as other research and extension specialists involved with agricultural development in its wider context.

Two themes are central in this book: (1) successful conservation and land use planning must start and finish with the farmer, i.e. land user; (2) an interdisciplinary approach, integrating the perceptions of specialists from different technical backgrounds, is an essential element of such work.

Requests to: Dr. B. Kerr, Chief Project Officer, Food Production and Rural Development Division, Commonwealth Secretariat, Marlborough House, Pall Mall, London SW1Y 5HX, England.

Making Haste Slowly. Strengthening local environmental management in agricultural development. H. Savenije and A. Huijsman, editors. Royal Tropical Institute, Amsterdam, 1991, 239p. ISBN 90-6832-040-8. Paperback.

In many areas of the world it is 'five minutes to twelve' - the threat to the local environment makes immediate action appear essential. But will immediate, and thus imposed, measures

achieve sustainable change? Or must we 'make haste slowly' - building on existing traditions, going ahead only with the support of the population and with institutionally viable programmes that fit the society?

This book deals with environmental management of small-scale agriculture in marginal areas. Institutional aspects of development - the embedding of new ideas and attitudes in the society, as well as the link between institutions and technologies - are seen as critical to strengthening such management. Further, they have broad implications for project design, policy planning, and research.

The focus is specifically on the local level, as vital to the success of any national or international policies. Relations among management levels, the actors involved, and the great uncertainty created by lack of definition in the mandates of customary and modern legal systems that regulate land use and management are all considered.

Case studies illustrate the great diversity of environmental problems and approaches. However, the lessons are similar: incorporating local information in policy, planning, and implementation decisions is a precondition for long term sustainability. Approaches must deal with institutional as well as technical aspects, taking the great variety of actors and potential conflicts among land users as points of departure. Therefore, a system based on strong local organizations - backed up by appropriate incentives and government supports - must replace imposed intervention.

Price: Dfl 39

Orders to: The Royal Tropical Institute (KIT), Mauritskade 63, 1092 AD Amsterdam, the Netherlands.

Transport Processes in Porous Media. NATO ASI Series, Series E: Applied Sciences, Vol. 202. J. Bear and M.Y. Corapcioglu, editors. Kluwer Academic Publishers, Dordrecht, Boston, 1991, xii + 825p. ISBN 0-7923-1363-1. Hardbound.

This volume contains the invited lectures presented during the NATO Advanced Science Institute congress (ASI) conducted in Pullman in 1989. The objectives of this seminar were: (1) to enhance communications among scientists and engineers from different disciplines, all of whom are engaged in the development of the theory of transport in porous media and in its application to solving problems of practical interest in their respective fields; (2) to present state-of-the-art review of selected advanced fundamental topics of transport in porous media; (3) to explore, through lectures and exchange of ideas among experts, the frontiers of knowledge in these selected areas, and to indicate topics and directions for future research; (4) to present and discuss examples of how the basic theory can be applied to complex cases of practical interest; and (5) to contribute to the development of a unified approach to transport phenomena as encountered in various disciplines.

The papers presented in this volume review and discuss: (1) the continuum approach to modelling transport in porous media, its validity, its limitations and methods for modelling transport when the continuum approach cannot be applied; (2) modelling spatial variability in *solid matrix properties*; (3) *fractal porous media and fractal approaches to modelling transport* in porous media; (4) the transport of contaminants in the unsaturated and saturated zone, and in fractured porous rock domains, as well as adsorption and chemical and microbial processes in the subsurface environment. Large-scale field experiments on contaminant transport are also described and analyzed; (5) multiphase flow through porous media-theory and laboratory experiments; (6) wave propagation in porous media; and (7) heat and mass transfers in frozen soils.

In the discussion on Needs and Directions for Future Research that took place at the end of the Institute, gaps between current knowledge and that required for solving pressing problems, especially in the broad area of subsurface contamination, have been identified and topics for further research have been indicated by the participants. This volume will help in advancing the understanding of transport phenomena, describing them and solving problems of practical interest.

Price: Hfl 380, US\$ 199, UK£ 129.

Orders to: see below.

Modelling and Applications of Transport Phenomena in Porous Media. J. Bear and J.-M. Buchlin (editors). Theory and Applications of Transport in Porous Media, Vol. 5. Kluwer Academic Publishers, Dordrecht, Boston, 1991, xii + 380p. ISBN 0-7923-1443-3. Hardbound.

This volume presents a short course on modelling and applications of transport phenomena in porous media. The opening chapter provides a methodology for constructing mathematical models of problems of transport in porous media on the basis of continuum approach. The next four chapters deal with applications such as multiphase, phase change phenomena, heat transfer, and drying processes. The last chapter of the book deals with the stochastic description of porous media. This book will be of interest to researchers in the fields of civil, chemical, reservoir and agricultural engineering, soil science, hydrology and hydraulics.

Price: Hfl 220, US\$ 119, UK£ 75.

Orders to: In U.S.A. and Canada: Kluwer Academic Publishers, 101 Philip Drive, Norwell, MA 02061, U.S.A.

Elsewhere: Kluwer Academic Publ. Group, P.O. Box 322, 3300 AH Dordrecht, The Netherlands.

Field Experiments and Measurement Programs in Geomorphology. O. Slaymaker, editor. A.A. Balkema, Rotterdam, and University of British Columbia Press, Vancouver, 1991, xi + 224p. ISBN 90-6191-996-7. Hardback.

This book advances a typology of experimentation in the field science of geomorphology - the study of the form of the earth's surface and the evolution of its relief. This typology is then applied to problems of total drainage basin change and subsets of processes of change associated with slopes and channels.

Geomorphology has traditionally been a descriptive discipline concerned with the evolution of landscapes over very long time periods. However, since the 1950s there has been a strong trend towards the study of contemporary processes of change and the influence of society as well as of natural biophysical factors. Consequently, an experimental approach is becoming more appropriate.

This work documents different field methodologies in geomorphology. The contributors are geomorphologists from Canada, the United States, the United Kingdom, and Japan. The review methods, global coverage, and advances in understanding while at the same time promoting a more dynamic, more relevant, and more applied science of earth surface change - the geomorphological aspects of global change.

Price: Hfl 110

Orders to: In U.S.A. and Canada: A.A. Balkema Publ., Old Post Road, Brookfield VT 05036, U.S.A.

Elsewhere: A.A. Balkema Publishers, P.O. Box 1675, 3000 BR Rotterdam, the Netherlands.

Climate, Earth Processes and Earth History. R.J. Huggett. Springer-Verlag, Berlin, New York, 1991, xiv + 281p. ISBN 3-540-53419-9 (German edition); 0-387-53419-9 (U.S. edition). Hardcover.

This book provides an overview of the relations between climate, surface processes and Earth history. It is unique in giving an up-to-date synthesis of the role of climate in the development of Earth surface systems.

After introducing the concept of world climate, the book explores the chief components of the biosphere - air, water and ice, sediments, landforms and soils, animals and plants, biomes and zoniobiomes - in relation to climate factors.

The reader will find a new view of the interplay between astronomical variables, the Earth's atmosphere, and biotic and abiotic systems at the surface of the Earth.

Price: DM 128

Orders to: In U.S.A. and Canada: Springer-Verlag, 175 Fifth Avenue, New York NY 10010, U.S.A.

Elsewhere: Springer-Verlag, Heidelberger Platz 3, D-1000 Berlin 33, Fed. Rep. of Germany.

A Study of the Reasons for Success or Failure of Soil Conservation Projects. FAO Soils Bulletin No. 64. N.W. Hudson. FAO, Rome, 1991, x + 65p. ISBN 92-5-103087-1.

There have, of course, been some very good and effective conservation projects and programmes in a number of countries but, nevertheless, in spite of substantial efforts and the expenditure of large sums of money over the last half century, the results have frequently been disappointing.

With this problem in mind, this study was undertaken to try to identify the reasons for success and failure in soil conservation projects. Armed with the results of this study, it should now be possible to avoid repeating many of the mistakes of the past and developing new projects which have a far greater chance of success.

Orders to: FAO Sales Agents all over the world, or: FAO, Distribution and Sales Section, Via delle Terme di Caracalla, 00100 Rome, Italy.

Technische Berichte zum NIBIS - Bodenkunde. I. Benne, H.-J. Heineke und R. Nettelmann. Niedersächsisches Landesamt für Bodenforschung, Hannover, 1990, 125 S. ISBN 3-980-1097-0-4.

Ein vorbereitender Schritt für die bodenkundliche Landesaufnahme in Niedersachsen ist die umfassende Auswertung der Ergebnisse der Bodenschätzung. Mit dieser Arbeit sollen die Voraussetzungen für eine automatische Umsetzung der Begriffe der Bodenschätzung in den normierten Sprachgebrauch der bodenkundlichen Landesaufnahme von Niedersachsen geschaffen werden. Dazu werden im folgenden die Termini der Bodenschätzung vorgestellt, ihr Inhalt interpretiert und die Daten gegliedert. Für eine automatische Datenauswertung sind Ergänzungen und Vereinheitlichungen der Bodenschätzungsangaben notwendig, die im einzelnen aufgeführt werden. Nach der Überarbeitung der Bodenprofilbeschreibungen werden die seit 1934 gebräuchlichen Termini der Bodenschätzung in den heutigen bodenkundlichen Sprachgebrauch übersetzt.

Zu diesem Zweck werden Übersetzungsschlüssel vorgelegt, in denen die Signa der Bodenschätzung, die Bedingungen für eine Übersetzung und die aus der Übersetzung resultierenden Bodenhorizonte oder Bodensubstrate wiedergegeben werden.

Bestellungen an: E. Schweizerbart'sche Verlagsbuchhandlung (Nägele u. Obermiller), Johannesstraße 3A, D-7000 Stuttgart 1, Bundesrepublik Deutschland.

Spatial Variabilities of Soils and Landforms. SSSA Special Publication No. 28. M.J. Mausbach and L.P. Wilding, editors. Soil Science Society of America, Madison, 1991, xvii + 270p. ISBN 0-89118-798-7. Paperback.

As technology for displaying and integrating soil geographical data into natural resource assessment expands, the demands for more precise information in support of soil resource inventories also increase. The need for such knowledge becomes even more acute as we enter the era of computers and information systems. Hence, users of soil surveys are demanding quantitative information on the composition and variability of soils in map unit delineations. This book reviews the recent gains made in this field and demonstrates its application in natural settings. It is the result of a symposium held at the 1989 annual meeting of the Soil Science Society of America. The objective of the symposium was to establish a forum for creative purposes in developing guidelines and procedures for quantitative description of map unit composition. Speakers were invited to illustrate relationship of landforms, landscapes, and stratigraphy to soil spatial variability, elucidate the scientific methodology as applied to soil surveys, compare and contrast the utility of classical and regionalized theory and statistical approaches in defining soil spatial variability, and present alternative strategies for transferring spatial variability knowledge to natural resource user clientele.

Price: US\$ 30 (advance payment and 10 per cent per book for postage is required on all orders outside the U.S.A.).

Orders to: see below.

Rates of Soil Chemical Processes. SSSA Special Publication No. 27. D.L. Sparks and D.L. Suarez, editors. Soil Science Society of America, Madison, 1991, xvii + 302p. ISBN 0-89118-795-2. Paperback.

Soil and environmental chemistry have traditionally relied almost exclusively on investigations of equilibria processes. These studies have provided much understanding of soil processes and the conditions under which a specific reaction could occur. This book identifies the important advances that have been made in this field during the past decade.

The first three chapters offer discussions of diffusion models for analyzing slow soil chemical reactions and on experimental methods which can be used to study these reactions. The next two chapters present recent advances in studying the kinetics of ion exchange on inorganic and organic constituents. Chapter 6 looks at sorption/desorption phenomena in soil while Chapter 7 reviews kinetics of important weathering reactions in soils, particularly primary silicates and oxides. The importance of rates of redox reactions on manganese oxides and their effects on the reactivity of toxic inorganics such as arsenic and chromium is the subject of Chapter 8. The next chapter discusses the role of metal oxides in the oxidation and hydrolysis of organic pollutants. The final chapters cover kinetic models used in column studies to predict the fate and transport of inorganic and organic species.

Price: US\$ 36 (advance payment and 10 per cent per book for postage is required on all orders outside the U.S.A.).

Orders to: ASA, CSSA, SSSA Headquarters Office; attn. Book Order Dept., 677 South Segoe Road, Madison WI 53711-1086, U.S.A.

Environmental Geochemistry in Northern Europe. Geological Survey of Finland, Special Paper 9. E. Pulkkinen, editor. Geologian tutkimuskeskus, Espoo, 1991, 321p. ISBN 951-690-422-X. Paperback.

This is the Proceedings of the first Symposium on Environmental Geochemistry in Northern Europe, held in Rovaniemi, Finland in October 1989. Thirty-nine of the lectures and posters presented at the symposium are compiled in this volume. The topics range broadly from descriptions of geochemical migration (lithosphere- hydrosphere-biosphere-atmosphere) to new environmental research methods and techniques.

Two papers demonstrate the role of geosciences in environmental research. The composition of the parent rocks and soils and sensitivity to acidification are discussed in nine articles. Acidification and pollution of water are the subject of seven papers. The correspondence between the chemical composition of the environment and the composition of the vegetation is treated in eleven papers. Geomedical aspects are examined in four articles. Five papers are devoted to research methods and special techniques in environmental geochemistry.

Price: FIM 260 + postage

Orders to: Geological Survey of Finland, Publication Sales, Betonimiehenkuja 4, SF-02150 Espoo, Finland.

Land Drainage. 4th international workshop, February 1990, Cairo. B. Lesaffre, editor. Cemagref-Dicova, Antony, 1991, 294p. ISBN 2-85362-220-7. Paperback.

There is a growing need to concentrate more effort on the improvement of drainage in developing countries. For example, it is estimated that currently 1 to 1.5 million ha of agricultural land are damaged around the world each year through human-induced salinization. Salinization is only one of the many problems that proper drainage systems are designed to address. Waterlogging is a problem that most people understand and is the primary source of salinization problems that can develop in arid and semi-arid climates. Drainage needs on some tropical and temperate humid area agricultural land is a critical component for agricultural sustainability and efficient productivity. Crop diversification desired in some areas also requires consideration of drainage elements.

The keynote and discussion papers of the workshop are divided in four parts: (1) sustainability of drainage systems; (2) technology transfer; (3) project preparation for funding; and (4)

drainage and regional planning. All papers are in English and have French summaries. Drainage Agricole. 4ème séminaire international, Février 1990, Le Caire. B. Lesaffre, éditeur. Cemagref-Dicova, Antony, 1991, 294p. ISBN 2-85362-220-7. Paperback.

Il est nécessaire d'accroître les efforts pour améliorer le drainage dans les pays en développement. On estime, par exemple, que, chaque année actuellement, la salinisation d'origine humaine dégrade entre 1 et 1,5 millions d'hectares de terres agricole. La salinisation n'est qu'un des problèmes auquel un drainage approprié doit faire face. L'engorgement des sols est le problème de base, à l'origine des risques de salinisation qui peuvent se développer sous climats arides et semi-aride. Dans certaines régions tempérées et tropicales, le drainage est une composante indispensable du maintien d'une agriculture performant et d'une production élevée. La diversification des cultures souhaitée dans certaines régions nécessite également la prise en considération de l'assainissement des terres.

Les articles de base et les contributions à la discussion sont divisés en quatre sections: (1) Durabilité des réseaux de drainage; (2) transferts technologiques; (3) élaboration des projets et financements; et (4) drainage et planification régionale. Toutes les contributions sont en anglais, mais sont accompagnées d'un résumé en français.

Price/Prix: FF 220

Orders to/Commandes à: Cemagref-Dicova, BP 22, 92162 Antony Cedex, France or/ou: ICID/CIID, 48 Nyaya Marg, Chanakyapuri, New Delhi 110021, India.

Suelos con aluminio activo y montmorillonita, clorita, illita vermiculita, interstratificados regulares o irregulares. F. Colmet-Daage, J. Irisarri y M.L. Lanciotti, redactores. INTA-ORSTOM, S.C. de Bariloche, 1991, 173p. Paperback.

El objetivo principal del convenio es el estudio de las clímosecuencias de suelos derivados de cenizas volcánicas y de su aplicación en la cartografía de la zonificación del potencial forestal. Se ha considerado interesante estudiar, en las regiones forestales importantes, la aparición de caracteres ándicos similares pero en suelos que no derivan de cenizas volcánicas sino de formaciones sedimentarias con arcillas cristalinas: clorita, illita, montmorillonita, etc.

La conclusión subraya las divergencias y convergencias entre "Andisoles no alofánicos y no volcánicos, derivados de arcillas" y los "Andisoles típicos con sustancias alofánicas silico-alumínicas, con hierro paracrystalino, derivados de cenizas volcánicas", cuyos resultados, obtenidos por los participantes de este mismo Grupo de Estudio de Suelos con Aluminio Activo, son expuestos en un trabajo similar.

Sols à aluminium actif avec montmorillonite, chlorite, vermiculite, illite, interstratifiés réguliers ou irréguliers. F. Colmet-Daage, J. Irisarri et M.L. Lanciotti, éditeurs. INTA-ORSTOM, S.C. de Bariloche, 1991 Paperback.

L'objectif principal de cet agrément est l'étude des clímo-séquences de sols dérivés de cendres volcaniques et de leur application à la cartographie de la Zonification du potentiel forestier. Il a donc paru intéressant d'étudier, dans d'importantes régions forestières, l'apparition de caractères andiques similaires, concernant des sols qui ne dérivent pas de cendres volcaniques mais de formations sédimentaires à argiles cristallines: chlorite, illite, montmorillonite... L'ouvrage traite séparément les sols dérivés de sédiments peu consolidés argileux montmorillonitiques .. et de matériaux plus anciens, davantage compressés, lutitiques avec des facies schisteux essentiellement constitués de chlorite et illite.

La conclusion souligne les divergences et les convergences entre "Andisols non allophaniques et non volcaniques dérivés des argiles", et les "vrais Andisols à substance allophaniques silico-alumineuses avec du fer paracrystalin, dérivés des cendres volcaniques", dont les résultats obtenus par les participants à ce même Groupe d'étude des sols à aluminium actif sont exposés dans un ouvrage similaire.

Orden/Commandes à: Mission INTA-ORSTOM, Casilla de Correo 277, 8400 S.C. de Bariloche, Argentina.

River Projects and Conservation. A manual for holistic appraisal. J. L. Gardiner, editor. John Wiley, Chichester, New York, 1991, xxxiii + 236p. ISBN 0-471-92643-4. Hardcover.

This manual is both an explanatory and a practical guide to the holistic appraisal required for today's river projects. It has been derived from the intense practical experience of a specially-formed appraisal team which tackled a wide range of high value projects between 1985 and 1988. Field-tested and revised several times, it shows how all factors may be brought together within an ordered (and auditable) procedure based on a framework of environmental assessment. The development of a project (once identified within its river catchment context) is described in part 1; part 2 deals in varying depth with a wide range of disciplines typical of modern river projects. The use of up-to-date data handling and modelling techniques are included.

Using this manual, the project management team will be able to assess what is required in each critical phase of the appraisal. The book will promote an awareness and understanding of the many elements involved in making-up a project team to meet the demands of environmental legislation and public expectation. The need for consultation and the identification of symptoms, causes, possible remedies and opportunities for environmental enhancement are demonstrated.

The message of the manual is that investment in holistic appraisal bears dividends in cost-effective implementation. Building a sound reputation and gaining public support are two of the rewards of this approach. The philosophical background to the manual is to create an adaptive method of management, which will work in partnership with nature.

Price: UK£ 50

Orders to: see below.

Process Studies in Hillslope Hydrology. M.G. Anderson and T.P. Burt, editors. John Wiley & Sons, Chichester, New York, 1990, x + 539p. ISBN 0-471-92714-7. Hardback.

Both field process investigations and computer modelling schemes of hillslope hydrological processes have developed significantly over the last decade. This text reviews this progress in the context of the major processes in the hillslope hydrological system. New themes of research are proposed which stress the importance of integrating soil physics and hydrology. These developments will facilitate hillslope process relationships with Geographical Information Systems and related areas at the subcatchment and catchment scale.

In a more general context, this book is a contribution to one of the major interactive debates in which hydrology is now becoming engaged—namely the search for initiatives linking hillslope hydrology modelling, field methods of model parameterization, and new conceptualizations based on field observation. The themes within this text should provide further process-based guidance therefore, not only to those having field process research interests, but also to those undertaking and developing physically based modelling of the hillslope hydrological system.

Price: UK£ 69.50

Orders to: John Wiley & Sons, 605 Third Avenue, New York NY 10158-0012, U.S.A. or: John Wiley & Sons, Baffins Lane, Chichester, West Sussex PO19 1UD, England.

Saline Agriculture. Salt-tolerant plants for developing countries. J.R. Goodin, E. Epstein, C.M. McKell and J.W. O'Leary, editors. National Academy Press, Washington, 1990, viii + 143p. ISBN 0-309-04189-9. Paperback.

Populations in developing countries are growing so quickly that the land and water are unable to sustain them. In most developing countries, prime farmland and fresh water are already fully utilized. Although irrigation can be employed to bring land in arid areas into production, it often leads to salinization.

Salt-tolerant plants, therefore, may provide a sensible alternative for many developing countries. These plants can be grown using land and water unsuitable for conventional crops and can provide food, fuel, fodder, fiber, resins, essential oils, and pharmaceutical feedstocks.

This report covers some of the experiences and opportunities in the agricultural use of saline land and water. Its purpose is to create greater awareness of salt-tolerant plants—their current and potential uses, and the special needs they may fill in developing countries.

Introducing new crops is always risky. Each species has its own peculiarities of germination, growth, harvest, and processing. When unfamiliar plants are launched where land, water, and climate are hostile, difficulties are compounded. Salt-tolerant plants will require special care to help meet the needs of developing countries, but, given their promise, this attention seems increasingly justifiable.

Price: US\$ 15 in the U.S.A. Readers in developing countries can write for a complimentary copy.

Orders to: National Academy of Sciences, 2101 Constitution Ave. N.W., Washington, DC 20418, U.S.A.

Pesticides in the Soil Environment: Processes, Impacts, and Modelling. SSSA Book Series 2. H.H. Cheng, editor. Soil Science Society of America, Madison, 1990, xxiii + 530p. ISBN 0-89118-791-X. Hardcover.

The purpose of this book is to provide a perspective on the fate and transport of pesticides in the soil environment that would help evaluate the effectiveness of pesticides for pest control and the impact of pesticide use on environment health.

The publication explores the pathways of pesticides from their entry into the soil environment through their progression in the various retention, transformation, and transport processes under various conditions. The impact of pesticides on the environment is also presented. The book documents the research and accomplishments made in agricultural chemistry over the last 40 years.

Price: US\$ 36. Prepayment and 10 per cent per book required for postage on all orders outside the U.S.

Orders to: ASA, CSSA, SSSA Headquarters Office; attn. Book Order Dept., 677 South Segoe Road, Madison WI 53711-1086, U.S.A.

Böden unter landwirtschaftlicher Nutzung. 48 Bodenprofile in Farbe. Th. Diez, H. Weigelt. BLV Verlagsgesellschaft, München, 1987, 126 S. ISBN 3-405-13440-4.

Dieses Nachschlagewerk bietet Ihnen kompaktes Praxiswissen über 48 landwirtschaftlich oder gärtnerisch genutzte Böden. Jeder dieser Kulturböden wird in einem eigenen Abschnitt vorgestellt: (1) Farbfoto, Profilbeschreibung und physikalische Kenndaten erläutern den Bodenaufbau; (2) Angaben über Entstehung und Verbreitung erklären die Unterschiedlichkeit der Böden und erleichtern ihre Zuordnung zu bestimmten Landschaften und Landschaftsteilen; (3) Aus Bodenaufbau und Eigenschaften werden Hinweise für die landwirtschaftliche Bewirtschaftung ebenso abgeleitet wie Nutzungseignung und Schwächen sowie Empfehlungen zur Bearbeitung, Düngung und Bodenverbesserung.

Bestellungen an: BLV Verlagsgesellschaft mbH, München, W-8000 München 40, Bundesrepublik Deutschland.

Mechanized Annual Cropping on Low Fertility Acid Soils in the Humid Tropics. A case study of the Zanderij soils in Suriname. Wageningen Agricultural University Papers 90.5. B.H. Janssen and J.F. Wienk, editors. Agricultural University Wageningen, 1990, ix + 230p. ISBN 90-6754-172-9. Paperback.

This report is based on research carried out in the framework of a project carried out in Suriname, South America, entitled 'The permanent cultivation of rainfed annual crops on the loamy soils of the Zanderij formation'.

The study shows that mechanized annual cropping in this ecologically problematic part of the tropics presents a number of problems which so far had not come to light and therefore had not been taken into account. The results provide a useful contribution to the existing information on the management of low fertility acid soils when used for annual cropping.

Price: Hfl 100,70.

Orders to: Kniphorst Library, P.O.Box 67, 6700 AB Wageningen, the Netherlands.

Variability of parameters for modelling soil moisture conditions. Studies on loamy to silty soils on marly bedrock in the Ardèche drainage basin (France). J.A. van den Berg. Doctoral thesis, Wageningen Agricultural University, 1989, 208p. ISBN 90-6266-071-1. Paperback.

Field experiments and additional measurements on undisturbed soil samples in the laboratory were done to investigate the variability of the parameters used in modelling soil moisture conditions. The conditions of soil water control the amount of moisture available for the plant cover, crop production, transport of contamination in the unsaturated zone, and are thus of interest for the study of processes of soil erosion and mass movement and for land evaluation. Attention was paid to hydraulic soil characteristics as well as to plant-soil parameters for determining actual evapotranspiration, which is an essential term of the soil moisture balance.

The research concerned loamy and silty soils in the Ardèche drainage basin in France, a loess soil from the Netherlands and -for the sake of contrast- two sandy loam soils in the Ardèche basin.

Concepts about hydraulic soil properties and soil texture, usually based on experiments with artificially packed soils, are discussed. A theory is developed to explain how the change in saturated conductivity under subsequent, ponded conditions is caused by local instability of the macropore walls. This theory could be sustained by computations with an electrical analogue.

The results obtained were compared with those reported in the literature. They demonstrate the need for models in which the variability of the hydraulic characteristics can be reduced to basic parameters. For land evaluation it is important for such parameters to be related to physiographic properties that can be mapped easily.

For a period of mainly dry weather the main terms of the reduced water balance (evapotranspiration and change in moisture storage) were determined at three sites. Application of the one-dimensional SWATRE model to these data sets shows that the simulation of such a simplified water balance provides valuable information about the extension of the soil compartments of the system to be modelled.

Price: Hfl 28.50

Orders to: Geographical Institute, State University Utrecht, P.O.Box 80.115, 3508 TC Utrecht, the Netherlands.

Land Subsidence. B. Singh and N.C. Saxena, editors. A.A. Balkema, Rotterdam, 1991, 673p. ISBN 90-6191-128-1. Hardback.

This is a huge book which records in great detail the proceedings of an international symposium on land subsidence held in December 1989 at Dhanbad, India. 94 authors contributed to 54 papers. Much of the experience reported was in India, but there were also contributions from 12 other countries worldwide. The papers are divided into sections on theory and modelling of subsidence (8 papers); case studies (30 papers); monitoring of subsidence (1 paper); and preventive measures and reclamation (6 papers). There is strong emphasis on subsidence connected with mining but geomorphologists and agriculturalists will find interesting material on the mechanics of mass movement and the section on prevention and reclamation.

Prof. N.W. Hudson, 2 Bedford Street, Amphilil, Bedf. MK45 2NB, U.K.

Price: UK£ 50, Hfl 165.

Orders to: In U.S.A. and Canada: A.A. Balkema Publ., Old Post Road, Brookfield VT 05036, U.S.A. Elsewhere: A.A. Balkema, P.O. Box 1675, 3000 BR Rotterdam, the Netherlands.

Sediment and Streamwater Quality in a Changing Environment: trends and explanation. N.E. Peters and D.E. Walling, editors. International Association of Hydrological Sciences Publication 203, 1991, 374p. ISBN 0-947571-08-6. Paperback.

This is the proceedings of one of the six symposia organised by IAHS during the XXth General Assembly of the International Union of Geodesy and Geophysics held at Vienna in August 1991. The others in that series are Hydrology for the water management of large river basins; Hydrological basis of ecologically sound management of soil and groundwater; Hydrological interactions between atmosphere, soil, and vegetation; Large river basins; Swollen groundwater; Soil and vegetation; Snow, hydrology, and forests in alpine areas; and Hydrology of natural and manmade lakes. This symposium was directed to the two major

disciplines Continental erosion, and Water quality. The first section on continental erosion, with 16 papers, is concerned with sediment-related issues including land-use effects on sediment transport, and is in effect a series of case studies from many countries. The second section on water quality has 16 papers, also mainly case studies. The third section brings together the two main issues with 8 papers on linkages between sediment and water quality, several on studies of heavy metal transport and of nutrient transport.

Prof. N.W. Hudson, 2 Bedford Street, Amptill, Bedf. MK45 2NB, U.K.

Price: US\$ 55

Orders to: in U.S.A. and Canada: IAHS, 2000 Florida Avenue NW, Washington DC 20009, U.S.A. Elsewhere: IAHS, Institute of Hydrology, Wallingford, Oxfordshire, OX10 8BB, U.K. or: UGGI, 140 rue de Grenelle, 75700 Paris, France.

Computerized Quality Control. Programs for the Analytical Laboratory. 2nd edition. T.F. Hartley. Ellis Horwood Series in Analytical Chemistry. Ellis Horwood, Chichester, New York, 1990, 245p. ISBN 0-13-15-16-14-0. Hardback.

This second edition of the text incorporates much new material and provides updated information on topics covered in the first edition. Quality control and statistics are sometimes regarded as the least interesting aspects of the analytical chemist's work. This book reverses such attitudes, illustrating how straightforward computer programs in BASIC can perform the tedious tasks of tabulating quality control data and producing statistical reports. Using this approach, the analyst can be confident that statistical evaluation of quality control data is available immediately upon completion of each step of the analytical process.

The book promotes a positive and realistic attitude to quality control in the laboratory, providing not only theory but also the programs to perform all the necessary tasks required of the typical analytical chemist. This new edition goes a long way towards meeting the now much higher expectations of analytical scientists in the areas of quality control and laboratory computing.

Orders to: Ellis Horwood Ltd., Market Cross House, Cooper Street, Chichester, West Sussex PO19 1EB, England.

The Scientific Management of Temperate Communities for Conservation. I.F. Spellerberg, F.B. Goldsmith and M.G. Morris, editors. The British Ecological Society, 1991, xv + 566p. ISBN 0-632-02976-5 (Hardbound) 0-632-03186-7 (Paperback).

This book is the proceedings of the 31st symposium of the British Ecological Society, held in Southampton in 1989.

In recent years public opinion has become very much more environmentally conscious but at the same time there has been, at least in the United Kingdom, a tendency to ignore the pressing need for more research into the factors and processes which control and influence the distribution and survival of plants and animals in our countryside. This symposium volume examines the progress made in research over the last eighteen years by ecologists and conservation biologists. The volume focuses on temperate regions but does not ignore the relevance of ecology and conservation in a global context. The authors stress the importance of ecological science as a basis for good conservation and also consider all-embracing, unifying topics such as future prospects for conservation on a global scale, data management, and modelling. This volume is an invaluable text and a reference source for the international community of ecologists and conservation biologists as well as those working in resource management and countryside management.

Orders to: in the U.S.A.: Blackwell Scientific Publications Inc., 3 Cambridge Center, Cambridge, MA 02142, U.S.A.

Elsewhere: Marston Book Services Ltd., P.O. Box 87, Oxford OX2 0DT, England.

The Extent of Soil Erosion - Regional Comparisons. E. Baum, P. Wolff and M.A. Zöbisch, editors. Topics in Applied Resource Management in the Tropics Vol.1. DISTL, Witzenhausen, 201p. ISBN 3-980-1686-1-1. ISSN 0933-4513. Paperback.

This publication aims to provide a platform for an international exchange of knowledge and experience related to the practical implications of resource management and conservation practices. It is primarily addressed to professionals in the field, such as planners, decision-makers and implementers of conservation projects. However, the land use in his immediate environment is the ultimate target. It does not suffice to improve his awareness of erosion hazards; he must also be given a real change to choose agronomic and technical measures adapted to his socio-economic and socio-political setting. The special focus on warm climatic regions takes account of the fact that, in view of rapid population growth, the need for increased agricultural production and, hence, careful resource management appears to be most urgent there.

This volume comprises contributions related to the degree and extent of soil erosion in selected areas. The first three papers deal with past efforts and experience with soil conservation and their applications to today's conservation practices and policies. Then follows a highlight on the potential of agroforestry as a soil conservation measure in eroded areas and its contribution to sustainable land use in the tropics and subtropics. The last set of papers describes the extent of soil erosion and soil conservation projects and techniques in three distinctly different environments: steep slope stabilization, a watershed management area, and the reclamation of gully-eroded areas.

Orders to: see below.

Dictionary of Soil Erosion and Soil Conservation - Wörterbuch der Erosion und Bodenerhaltung. English-Deutsch, German-English. M.A. Zöbisch. Topics in Applied Resource Management in the Tropics. DITSL, Witzenhausen, 174p. ISBN 3-9801686-0-3. ISSN 0933-4513. Paperback.

This dictionary has been developed from a selection of technical terms collected for the students of the Faculty of International Agriculture of the University of Kassel to assist them with their study of English technical literature.

The terminology of soil erosion and soil conservation draws upon terms from an array of different technical disciplines, e.g. agriculture, soil science, geomorphology, soil and water engineering, ecology, social and economic sciences, etc. Some common translations have been revised to suit special soil and water conservation applications.

Orders to: Deutsches Institut für tropische und subtropische Landwirtschaft GmbH, Postfach 1652, W-3430 Witzenhausen, F.R. Germany.

Making the Link. Agricultural research and technology transfer in developing countries. D. Kaimowitz, editor. Published in cooperation with International Service for National Agricultural Research (ISNAR). The Hague, Westview Press, Boulder, San Francisco, 1990, xiv + 278p. ISBN 0-8133-7896-6. Paperback.

New technology generated by scientists and disseminated to farmers through the process known as technology transfer drives agricultural development worldwide. Building effective links between scientists, technology transfer workers, and farmers is vital to this process and is one of the most widely debated issues in agriculture today. In this volume, eleven specialists offer a multidisciplinary evaluation, stimulating new insight and giving new direction to solutions for this complex problem. Agricultural scientists and technology transfer workers, managers of agricultural research and extension organizations, policy-makers concerned with public administration, and scholars interested in these issues will find special value in this approach to agriculture in the developing world.

Price: £ 16,50

Orders to: see below.

Technology Systems for Small Farmers. Issues and Options. A.M. Kesseba, editor. Published in cooperation with the International Fund for Agricultural Development. Westview Press, Boulder, 1989, xiii + 229p. ISBN 0-8133-7925-3. Paperback.

The authors of this volume address several important issues related to agricultural research

and extension from the perspective of the small farmer, asking in particular how research can better be focused on the needs of small farmers. Can traditional farming methods, skills, and practices be successfully integrated into new technology systems? Can technologies be developed that allow intensive resource use without compromising the state of the resource base?

The contributors consider how productivity on smallholder farms can be improved through the use of better research systems and the development of economically viable and appropriate technologies. Stressing the effort that is needed to ensure improvement, they examine all aspects of the technology system, including policy formulation and decision making, research and generation of new technology, the transfer of new techniques, and most importantly, their utilization.

Orders to: Westview Press, 5500 Central Avenue, Boulder, CO 80301, U.S.A. or: Westview Press Inc., 13 Brunswick Centre, London WC1N 1AF, England.

Les Bases physiques, chimiques et minéralogiques de la Science du Sol. H. Chamayou et J.-P. Legros. Collection Techniques Vivantes, Agence de Coopération Culturelle et Technique, 1989, xv + 593p. ISBN 92-9028-148-0. Cartonné.

Cet ouvrage a été écrit pour les nouveaux étudiants en Science du Sol et pour tous ceux qui veulent se recycler dans cette discipline. Il a pour ambition de fournir les bases physiques, chimiques et minéralogiques permettant de lire les publications spécialisées, de comprendre l'organisation du sol et les phénomènes complexes intéressant le fonctionnement de celui-ci.

L'ouvrage est organisé en sept chapitres indépendants qu'il n'est pas nécessaire d'aborder dans un ordre strict: (1) Squelette du sol, (2) Argiles, (3) Matière organique, (4) Organisation et propriétés physiques, (5) Eau dans le sol, (6) Solution du sol, et (7) Système sol-plante-atmosphère.

A la demande de l'Agence de Coopération Culturelle et Technique, une attention toute particulière a été accordée aux sujets susceptibles d'intéresser les pays francophones en développement. Les auteurs y ont par exemple traité en détail ce qui concerne les oxydes-hydroxydes, leurs propriétés d'échange et tout de qui touche à l'eau.

Prix: FF 160

Commandes à: Agence de Coopération Culturelle et Technique, 13 quai André Citroën, 75015 Paris, France.

Soil Biochemistry. Volume 6. J.-M. Bollag and G. Stotzky, editors. Marcel Dekker, New York and Basel, 1990, x + 565p. ISBN 0-8247-8232-1. Hardback.

This state-of-the-art reference explores the prominent role of biochemical processes in the soil environment-particularly the activity of microorganisms in soil. It stresses the potential application of biochemical processes in soil to environmental biotechnology.

This volume highlights applications of biotechnology, molecular biology, and microbial genetics to soil biology and biochemistry ... aerobic and anaerobic microbial transformations of natural and xenobiotic organic compounds in surface and subsurface soils and sediments ... interactions between soil microorganisms and radionuclides and organometallic compounds ... the origin, nature, and decomposition of lipids and their effect on the physical properties of soil ... the role of clay minerals and clay-enzyme complexes in these transformations and interactions ... relevance of microbial biomass and activity to the ecology of microorganisms in soil ... the role of soil microorganisms in enhancing plant growth by the production of growth-promoting cytokinins and compounds inhibitory to soil-borne, root-infecting pathogens ... and soil as a reservoir of viruses.

Orders to: Marcel Dekker Inc., 270 Madison Avenue, New York NY 10016, U.S.A.

Soviet Agriculture. Comparative Perspectives. K.R. Gray, editor. Iowa State University Press, Ames, 1990, xiii + 284p. ISBN 0-8138-0488-4. Hardbound.

While perestroika has brought considerable political change to the USSR, the economy remains stagnant and resistant to reform and the agricultural sector is particularly worrisome.

Already one of the world's top three importers of agricultural products, the former USSR faces periodic food shortages despite the continuing efforts of economic planners to raise production.

In this book, thirteen leading specialists in geography, economics, and political science, from six countries, provide the analysis needed to understand Soviet agriculture at the end of the 1980s. Frequent comparisons are made with the food and agricultural systems of other socialist and capitalist countries. Topics include the performance of agricultural productivity, food consumption, food processing, rural housing, soil conservation, farm prices, labor payment systems, and the increasingly important private sector. The second part of the book focuses on the relevance to the former USSR of agricultural reform in other socialist countries, including Bulgaria, Hungary and China.

This book is meant for anyone interested in agriculture and reform in centrally planned economies.

Price: \$ 34.95

Orders to: Iowa State University Press, 2121 S. State Avenue, Ames IA 50010, U.S.A.

Environmental Ecology. The impacts of pollution and other stresses on ecosystem structure and function. B. Freedman. Academic Press, San Diego, London, 1989, x + 424p. Hardback.

The eleven chapters of this book are treating the following issues: (1) Air pollution; (2) Toxic elements; (3) Acidification; (4) Forest decline; (5) Oil pollution; (6) Eutrophication of fresh water; (7) esticides; (8) Harvesting of forests; (9) Loss of species richness; (10) Ecological effects of warfare; and (11) Effects of stress on ecosystem structure and function. This book is intended to students taking an upper undergraduate or graduate course in environmental ecology, in which the ecological impacts of pollution and other stresses are the primary focus. It will also be useful as a supplemental source of information for more general university-level courses in environmental studies, and to ecologists and other professionals whose specific interests fall within the multi- an interdisciplinary field of environmental science.

Price: UK£ 29

Orders to: Academic Press Ltd., 24-28 Oval Road, London NW1 7DX, U.K. or: Academic Press Inc., San Diego, CA 92101, U.S.A.

Wildlands, their Protection and Management in Economic Development. G. Ledec and R. Goodland. The World Bank, Washington DC, 1988, xxii + 278p. ISBN 0-8213-1154-9. Paperback.

The world's wildlands are increasingly under pressure from population growth and economic development. But to view wildlands and human needs as necessarily in conflict is a disservice to both environmental and economic interests. In this book, the authors show how wildlands contribute substantially to economical development and to the well-being of the population, particularly in the long term.

Wildlands protect the soil, control erosion and sedimentation, recycle wastes, reduce floods and droughts, buffer against storms, and provide habitat for plant and animal species that are of known or potential value. Preserving important wildlands is by far the cheapest and least complicated way of ensuring that these vital environmental services continue.

The authors show how the policy has been applied in specific cases and address some of the practical considerations in establishing and administering protected areas.

Price: US\$ 17.95

Orders to: The International Bank for Reconstruction and Development, The World Bank, 1818 H Street, N.W., Washington DC 20433, U.S.A.

Vanishing Land and Water. Soil and water conservation in dry lands. J.-L. Chleq and H. Dupriez. Land and Life series. Terres et Vie, Nivelles, 1988, vi + 117p. ISBN 0-333-44597-X (in English) 2-87105-007-4 (in French). Paperback.

This volume is about soil and water management in arid lands. In the Sahelian region of Africa, as in many other arid regions, arable land is vanishing due to erosion and a decrease in

available water. A group of artisans and villagers in one area of the Sahel are winning the struggle against vanishing land and water. This book explains the reasons behind the problems and the methods which have been evolved to overcome them, with detailed descriptions and diagrams of the construction of the terraces, channels, ditches, barrages, gabions, wells, boreholes, pumps and other lifting devices employed.

Price: FB 560 (US\$ 15, UK£ 8.4, FF 90).

Orders to: Terres et Vie, 13 rue Laurent Delvaux, 1400 Nivelles, Belgium.

A Modern Approach to the Protection of the Environment. G.B. Marini-Bettòlo, editor. Pontificia Academia Scientiarum, in association with Pergamon Press, 1989, xxi + 606p. ISBN 0-08-040816-8. Hardcover.

The protection of the environment represents today a priority in both research and action to avoid the disruption of the ecosystems forming the biosphere, which may lead to an unlivable planet. This book is the proceedings of a Study Week with the same title, organized by the Pontifical Academy of Sciences in November 1987.

Among the multifaceted topics and aspects of ecology, it was decided that on the basis of the data so far obtained through research in the last twenty years and the analysis of the state of the biosphere, the object of the meeting should be that of suggesting solutions in order to protect our environment, that is, how to go into action.

The different papers are arranged in the following sections: (1) Ethics of the use of natural resources and of the respect of the environment; (2) Strategies for the protection of the environment; (3) System-wide approach to the problems of the protection of the environment; (4) Instruments; and (5) Conclusions and final considerations.

Price: US\$ 59.95

Orders to: Pergamon Press, Headington Hill Hall, Oxford OX3 0BW, England; or: Pergamon Press, Maxwell House, Fairview Park, Elmsford, NY 10523, U.S.A.

Geotextiles Manual. The French Committee of Geotextiles and Geomembranes, Bagnaux. 64p.

From 1981 to 1986, this Committee has published, in French, seven booklets of recommendations for the use of geotextiles in various applications. These recommendations are widely used by government agencies, consultants and contractors.

The present publication is the English translation of these booklets. It has seven parts corresponding to the original booklets: (1) Acceptance and laying of geotextiles; (2) Temporary access roads, low volume roads and improved subgrades; (3) Storage and parking areas; (4) Parks, sport and recreation areas; (5) Embankments on compressible soils; (6) Drainage and filtration systems; and (7) Railway tracks.

Price: US\$ 45 plus 15% postage.

Orders to: IFAI, 345 Cedar Street, Suite 800, St. Paul, MN 55101, U.S.A.

ISEE 4. 4th International Symposium on Earthworm Ecology, Avignon 11-15 June 1990. Résumés- Zusammenfassung- Abstracts

This publication provides the abstracts of oral communications and posters presented at this symposium. The papers were presented during 9 sessions: Taxonomy and fundamental biology; Other clitellata; Applied biology of epigeic earthworms; Biogeography; Earthworm ecology and behaviours; Earthworm relationships to biotic and biogenic factors in soils; Earthworms and soil physical properties; Land uses of earthworms; and Earthworms and soil contamination.

Orders to: Dr. A. Kretzschmar, INRA, Laboratoire de Physique et Biologie des Sols, Domaine St Paul, Cantarel, B.P. 91, F- 84143 Montfavet Cedex, France

Soil Research in Denmark. *Folia Geographica Danica*, Tom. XIX. J.P. M"berg and H. Breuning Madsen, editors. The Royal Danish Society. C.A. Reitzels Forlag, 1991, 196p. ISBN 87-421-0531-1. Paperback.

This compilation of articles on soil research in Denmark is dedicated to Professors Jacobsen and Rasmussen, on their 70th birthdays. Both played a significant role in the development of soil

science. The publication has an extensive contribution on the history of pedological research in Denmark, which is followed by ten articles on pure and applied research in the country, mostly in relation to field conditions. The last four papers illustrate the involvement of Danish pedologists outside their own country.

Price: US\$ 25

Orders to: C.A. Reitzel Forlag, Nørregade 20, DK-1165 Copenhagen K, Denmark.

Can Conservation Strategies Lead to Sustainable Development? March/April 1990 issue of *Alternatives*. R. Gibson (editor). 92p. ISSN 0002-6638. Paperback.

This volume addresses the major issue of our times - how can humans develop a more acceptable relationship with the world around them? The articles reveal how very far we are from such a relationship with other humans, other living things, and the environment in the broad organic, inorganic and aesthetic sense.

There is no justification for delaying action while ideological matters are being sorted out. All the papers in this collection stress the specific and the practical. All call for certain things in common: (1) the need for more awareness and involvement by as many people as possible; (2) the need for more and better information as a basis for informed thought and discussion; (3) the need for national and provincial commitments to sustainable development and conservation strategies; (4) the difficulties in attracting attention to and working out the meaning of these concepts, and finally (5) the fundamental importance of getting action at the grassroots or the local and regional level where the job really has to be done well if we wish our offspring to have access to a world and a universe that can be as supporting and inspiring as that which has come to us from the past.

Requests to: *Alternatives*, c/o Faculty of Environmental Studies, University of Waterloo, Waterloo, Ontario, Canada N2L 3G1.

SPECIES: A Spreadsheet Program for Modeling Speciation of Soil Solution. Ph. Barak.

The Program SPECIES is a solution equilibrium model for teaching concepts of ion activity and speciation as applied to soil solutions. The program is available as a spreadsheet file SPECIES.WK1 for use with Lotus 1-2-3 (Release 2.0, 2.01) or compatible spreadsheet programs (not supplied) which run on any IBM or compatible microcomputer and support most printers and graphics cards.

For more information; see *Journal of Agronomic Education*, Vol. 19, No.1.

Price: The program will be supplied free upon receipt of a formatted blank diskette (either 3-1/2 or 5-1/4 inch)

sent to: Dr. Phillip Barak - SPECIES, Dept. of Soil Science, University of Minnesota, St. Paul, MN 55108, U.S.A.

Nitrogen Cycles in the Present Agriculture. P. Bielek, V.N. Kudeyarov, editors. *Príroda* Bratislava, 1991, 244 p. ISBN 80-07-00282-0. Hardbound.

The purpose of this book is to summarize the present state of knowledge on theoretical as well as practical questions in soil science and their relation to other components of the environment. The impacts of anthropogenic factors (agricultural, non-agricultural) on the above mentioned processes are evaluated with respect to production and ecological effects. The publication contains the following chapters: Nitrogen balance in the present state of anthropogenesis; Soil internal nitrogen processes and productivity of agroecosystems; Nitrates in plants; Optimization methods of fertilization and nitrogen plant nutrition. The monography is the common work of an international group of authors from the CSFR and the C.I.S.

Price: US\$ 25

Requests to: Soil Fertility Research Institute, Gagarinova 10, 827 13 Bratislava, Czechoslovakia

Common Property Resources. Ecology and community-based sustainable development. F. Berkes, editor. Belhaven Press, London, 1989, x + 302p. ISBN 1-85293-080-2. Hardback.

This volume aims at identifying and dealing with certain concepts of the natural and social sciences which are central for the management of common-property resources. It is meant to help social scientists appreciate the relevant ecological concepts, and in turn, help ecologists appreciate some key considerations in the social sciences and human ecology. It is organized in four parts, preceded by the Introduction, which sets out the problematique, definitions, various concepts of common property and resource-management regimes, and provides an overview of the significance of common-property systems. Part 1 deals with perspectives on resource management. Part 2 explores a range of issues in the background of resource management: the appropriate role and limitations of science; the shortcomings and misuse of neoclassical economics; the science and ideology of conventional exploitive development of resources; and alternative approaches and management frameworks. The last two parts provide case studies, either single-resource case studies or multiple-resource cases.

Price: £ 32.50

Orders to: Belhaven Press, 25 Floral Street, London WC2E 9DS, U.K.

The Technology Triangle. Linking Farmers, Technology Transfer Agents, and Agricultural Researchers. D. Merrill-Sands and D. Kaimowitz. International Service for National Agricultural Research, ISNAR, The Hague, 1990, xiv + 118p. Paperback.

Links between agricultural research institutes and their clients -farmers and technology transfer agencies- are vital for successful technology development and delivery. Direct links with farmers, developed through on-farm research, ensure relevance and rapid feedback. Links with technology transfer agencies ensure impact through a wider dissemination of technologies. The two sets of links are complementary, and both are necessary; one cannot substitute for the other. Research managers have found these links difficult to organize and sustain, particularly when addressing the needs of resource-poor farmers. Yet experience has shown that weak links have costs few developing country research systems can afford. Linkage problems not only reduce efficiency, they also impair performance and diminish the impact of agricultural research.

This document summarizes the presentations and discussions of a Workshop held in The Hague in November 1989. The Workshop was convened to review the findings of two on-going studies on how to strengthen links with farmers and technology transfer agencies. These studies have focused on five key areas: Policy and institutional context of links; Organizational factors affecting links; Types of linkage mechanisms; Staff management issues; and The need for active management.

Price: free of charge

Requests to: ISNAR, Publications Dept., P.O. Box 93375, 2509 AJ The Hague, the Netherlands.

Issues in Development Management in Sub-Saharan Africa. L. Adamolekun. World Bank, Washington, 1989, viii + 48p. ISBN 0-8213-1338-X. Paperback.

This report synthesizes the key issues discussed in the series of four seminars and a wrap-up workshop on Development Management organized between November 1986 and December 1988. The report is in three parts. The introduction is devoted to a brief account of the background to the seminar series covering such items as location, duration, participants, and partner institutions. In the second part, which constitutes the core of the report, the discussions of the key issues identified by seminar participants as the central concerns in Development Management are reviewed in some detail with particular attention to the major findings and conclusions. The third part is devoted to a discussion of the implications of the major findings and conclusions of the seminars for future work in the field of development management, including the role to be played by the Economic Development Institute.

Orders to: see below.

The Gezira Irrigation Scheme in Sudan. Objectives, Design, and Performance. H. Plusquellec. World Bank Paper No. 120. World Bank, Washington D.C., 1990, vii + 93p + maps. ISBN 0-8213-1536-6. ISSN 0253-7494. Paperback.

For the Sudan Gezira Scheme, the eighties have been a decade of missed opportunities. Despite considerable momentum on rehabilitation, the scheme is operating well below its potential. Unless its key actors embark on a major reform of production arrangements in the scheme, Gezira will not be the engine of growth that Sudan desperately needs in the nineties. Placing the farmer at the center of the production process, with the Government and parastatal providing the enabling environment through a policy framework and basic facilities such as research, extension and investment promotion, is the key to Gezira's future. Efforts, such as the present case study, should assist decision makers in the task of realizing Gezira's potential in the nineties.

Orders to: see below.

Irrigation in Sub-Saharan Africa. The development of public and private systems. S. Barghouti and G. Le Moigne. World Bank Paper No. 123. World Bank, Washington D.C., 1990, ix + 99p. ISBN 0-8213-1554-4. ISSN 0253-7494. Paperback.

Many African governments believe that large-scale irrigation will enable their countries to become self-sufficient in food production. Experts project that the 5 million hectares now under irrigation can be expanded to up to 25 million hectares. The World Bank's experience with irrigation in Africa, however, has been mixed. Cost overruns, low economic rates of return, and institutional problems with operation and maintenance have plagued many projects.

This report reviews the outcomes of a number of irrigation strategies and projects in the region. It examines the problems that have arisen in past attempts to expand irrigated agriculture, as well as successful examples of irrigation development. Recommendations for future design and implementation are outlined. The report comprises ten papers, including case studies of private sector development of irrigation systems in Nigeria, Senegal, and Zimbabwe.
Price: \$ 7.95

Orders to: The World Bank, Publications Dept. J2152, 1818 H Street N.W., Washington D.C., 20433, U.S.A.

Die Erodierbarkeit charakteristischer Böden im Südosten der VR China. J. Marx. Osteuropastudien der Hochschulen des Landes Hessen, Reihe I, Band 162. Justus-Liebig-Universität, Giessen, 1988, 156 S. ISBN 3-428-06565-4. ISSN 0078-6888.

Rotverwitterte Böden auf tiefverwittertem Gestein (Acrisole) im Hügelland des subtropischen Südostens der Volksrepublik China sind insbesondere nach Entwaldung, Übernutzung und zunehmendem Ackerbau in den Hanglagen in starkem Maße von Erosion durch Wasser betroffen. Die Erosionsanfälligkeit von 6 ackerbaulich genutzten, für die Region charakteristischen Böden wurde mittels eines Regensimulators gemessen. Bodentextur, -struktur, Strukturstabilität, Wasser- und Luftleitfähigkeit wurden bestimmt. Die Ergebnisse zeigen, daß die Böden mit sehr geringem Sandanteil (<5%), geringem Grobporenanteil, geringer Wasser- und Luftleitfähigkeit und niedriger Aggregatstabilität -diese weisen gleichzeitig einen niedrigen Humusgehalt auf- deutlich stärker von flächenhafter Erosion betroffen waren als die Böden mit entsprechend hohen Werten. Strukturstabilität und Wasserleitfähigkeit sind die wichtigste Voraussetzung für geringe Erodierbarkeit. Neben der Korngrößenverteilung beeinflusst im Zielgebiet vor allem der Humusgehalt diese Eigenschaften, da Frostgare, Tonquelle und -schrumpfung kaum eine Rolle spielen. Durch die Verwendung von Rinderdung und Stroh als Brennmaterial entsteht ein Mangel an organischem Dünger, der die Bodenerosion fördert. Auch fehlt es an Mulchmaterial, um in der Zeit des Wechsels von der Winter- zur Sommerfrucht, in der die erosionsauslösenden Niederschläge fallen, den unvollständig bedeckten Boden zu schützen.

Preis: DM 34

Bestellungen an: siehe unten.

Lößböden der VR China und Sowjet-Zentralasiens und ihre Genese. L. Uribe Osses. Osteuropastudien der Hochschulen des Landes Hessen, Reihe I, Band 164. Justus-Liebig-Universität, Giessen, 1989, 177 S. ISBN 3-428-06594-8. ISSN 0078-6888.

Die Kenntnisse über die Lößböden Chinas und Sowjet-Zentralasiens sind im Ausland vergleichsweise lückenhaft. Eine Übersicht über die bisher in diesen Bereichen vorgenommenen Forschungen zeigt ein recht wechselhaftes Bild. Eine Auswahl neuerer Publikationen dokumentiert den gegenwärtigen Forschungsstand. Die durchgeführten chemischen, mikromorphologischen, granulometrischen und röntgenographischen Analysen an Bodenproben aus Sowjet-Zentralasien und dem chinesischen Lößplateau liefern wertvolle Erkenntnisse über die Entwicklungstendenzen der wesentlichen und typischen Böden dieser Bereiche. Sie ermöglichen die Bewertung der Böden in bezug auf Bodenfruchtbarkeit, Erosionsanfälligkeit, Infiltration und Wasserspeicherung. Aus den tonmineralogischen Untersuchungen ist zu schließen, daß die Lössе der beiden Gebiete nur schwach verwittert sind und daß die Lössе in Zentralasien weniger verwittert sind als die Lössе des chinesischen Lößplateaus. In Bodenproben aus der Inneren Mongolei und aus Manas ist ein bei 11,3 Å reflektierendes Mineral festgestellt worden, welches in der Fachliteratur bisher nicht beschrieben worden ist. Bei 15,3 Å ist ebenfalls ein noch nicht identifizierter Reflex festgestellt worden. Diese Arbeit liefert auf der Basis experimenteller Ergebnisse einen Beitrag zur Lößentstehung und Lößentwicklung in Zentralasien und China.

Preis: DM 36

Bestellungen an: siehe unten.

Vergleichende Untersuchungen an deutschen und chinesischen Steppenböden. Taolin Zhang. Osteuropastudien der Hochschulen des Landes Hessen, Reihe I, Band 167. Justus-Liebig-Universität, Giessen, 1989, 174 S. ISBN 3-428-06744-4. ISSN 0078-6888.

Die durch das Institut für Bodenkunde der Chinesischen Akademie der Wissenschaften in Nanjing und das Dokucsev-Institute in Moskau durchgeführten Voruntersuchungen der Bodenverhältnisse in Steppengebieten der Volksrepublik China sowie mehrere bodenkundliche Forschungsaufenthalte in der VR China im Rahmen des deutsch-chinesischen Wissenschaftler-Austauschprogramms zwischen der Max-Planck-Gesellschaft und der Academia Sinica boten die Voraussetzungen für einen Vergleich der chinesischen Steppenböden mit den mitteleuropäischen Tschernosemen. Alle untersuchten Böden sind aus Löß mit vergleichbarer Körnung entwickelt. Zum Vergleich wurden alle bodensystematisch relevanten Merkmale und Eigenschaften der Böden herangezogen. Untersucht wurden die chemischen, physikalischen, mikromorphologischen, pollenanalytischen, tonmineralogischen und isotopenanalytischen Merkmale. Die chinesischen Böden wurden bisher ausschließlich nach sowjetischen Methoden untersucht und nach der sowjetischen Systematik klassifiziert. Die Ergebnisse, die mit Hilfe moderner, international verbreiteter Methoden erzielt wurden, sind sehr gut dazu geeignet, bei der Interpretation bodengenetischer Prozesse, bei der Erstellung von Bodenkarten und bei der Klassifizierung der Steppenböden durch Anwendung der FAO-Systematik eine weltweite Vergleichbarkeit herzustellen.

Preis: DM 34

Bestellungen an: siehe unten.

Vergleichende Untersuchungen an Böden aus Basalt in Süd-, Ost- und Nordostchina sowie in der Bundesrepublik Deutschland. Xuezheng Shi. Osteuropastudien der Hochschulen des Landes Hessen, Reihe I, Band 168. Justus-Liebig-Universität, Giessen, 1989, 115 S. ISBN 3-428-06745-2. ISSN 0078-6888.

Der Basalt ist, ähnlich wie der Löß, ein weltweit verhältnismäßig gleichmäßig zusammengesetztes Ausgangsgestein und daher vorzüglich geeignet, Verwitterungsunterschiede zu ermitteln. In dieser Arbeit wurden auf den jungtertiären Basalten des Vogelsberges die rezenten Verwitterungsprodukte des gemäßigt humiden Klimas Mitteleuropas sowie die Paläobodenreste mit den humiden tropischen bis subtropischen Böden in China verglichen. Schwerpunkt der Untersuchungen waren bodenphysikalische, bodenchemische und

tonmineralogische Analysen an Bodenproben repräsentativer Böden der jeweiligen Regionen. Die Untersuchungsergebnisse liefern wertvolle Erkenntnisse über die komplizierte Genese und die Entwicklungstendenzen der typischen Böden dieser Bereiche. Diese Arbeit liefert auf der Basis experimenteller Ergebnisse einen Beitrag zur Beurteilung des Fruchtbarkeitszustandes der Basaltböden Chinas. Die chemisch-mineralogischen Veränderungen und die Korngrößenverteilung in den Profilen können als Kriterien für eine neue Klassifikation der Basaltböden Chinas dienen. Die bisherige chinesische Bodenklassifikation basiert auf der sowjetischen Gliederung der Böden, bei der die Böden der tropischen und subtropischen Regionen die größten Schwierigkeiten bereiten, weil es in der Sowjetunion nur wenig vergleichbare Böden gibt.

Preis: DM 28

Bestellungen an: Duncker & Humblot, Postfach 41 03 29, 1000 Berlin 41, Bundesrepublik Deutschland.

Soil Colloids and their Associations in Aggregates. NATO ASI Series, Series B: Physics, vol. 215. M.F. De Boodt, M.H.B. Hayes and A. Herbillon. Plenum Press, New York, 1990.

This book has five parts. Part I deals with the structures and the surface properties of the soil inorganic colloids, and includes detailed treatments of soil clays, and of iron, manganese, and aluminium oxides, and makes special reference to allophanes, imogolite, and organo-alumino polymer associations. Part II provides detailed treatments of the genesis, composition, and aspects of the structures of soil humic substances and polysaccharides, and of the ways in which microorganisms and enzymes are influenced by soil colloid surfaces. Part III discusses water at clay surfaces and its influence on the behaviour and microstructure of clay minerals. The soil crumb, or aggregate, has not been at the centre of interest in soil chemistry. This is surprising in view of its fundamental role in plant growth. However, in Part IV there is a "dissection" of the soil aggregate in terms of its components, and a discussion of the associations of the components in forming aggregates, and of the interparticle forces giving rise to the stabilities of the aggregates.

In a world where factory-farming procedures are on the increase, there is a slow, though inevitable breakdown of the soil crumb, with the subsequent loss of colloids through erosion and oxidation processes. There are discussions in Part V of the uses of anthropogenic polymers for the stabilization of aggregates. It is evident that such polymers have important roles to play in aggregate stabilization processes.

As a companion volume may be mentioned *Interactions at the Soil Colloid-Soil Solution Interface* by G.H. Bolt, M.F. De Boodt, M.H.B. Hayes and M.B. McBride (see bulletin 79, p.99). The contributors to these two books are

leaders in their field, and the expertise has been expertly blended to produce these high-quality books. These will be essential reading for students with appropriate backgrounds in chemistry, and who seek an understanding of the processes and interactions which take place in the soil environment. D. Gabriels, Ghent, Belgium

Orders to: Plenum Press, 233 Spring Street, New York, NY 10013, U.S.A.

Destruction of Hazardous Chemicals in the Laboratory. G. Lunn and E.B. Sansone. John Wiley, Chichester, New York, 1990, xi + 271p. ISBN 0-471-51063-7. Hardback.

This book sets forth effective degradation/decontamination procedures for a wide variety of the extremely hazardous chemicals and compounds commonly found in today's research laboratories. It brings together all currently known laboratory destruction procedures in a single, convenient reference.

With precise and practical guidelines for hazardous reduction, cost savings, and decreased waste, it details methods that can be used to degrade small quantities of these chemicals directly in the labs in which they are used. This single guide for decreasing hazards and minimizing waste in the lab features: (1) Full practical details for the destruction of each chemical and the analysis of the residues; and (2) Lab-tested validation of procedures, some verified by international collaborative studies (many have been tested to see if the final reacting mixtures are mutagenic).

The book also contains information on dealing with spills - with special coverage given to wipe solvents necessary to determine the ultimate success or failure of a cleanup.

Price: £ 51.35

Orders to: see below

Surface Coal Mining Effects on Ground Water Recharge. National Academy Press, Washington, 1990, x + 159p. ISBN 0-309-04237-2. Paperback.

This report was prepared by a committee of specialists in hydrology, soil science, water quality, and law, which had the task to undertake an assessment of technologies currently used to evaluate ground water recharge. The scope of their work included the following items: (1) definition of the term "recharge capacity" technically and in the context of the Surface Mining Control and Reclamation Act, and with regard to the matter of overall local water budget; (2) identification of methods for estimating ground water recharge in mining areas; (3) a critique of the strengths and weaknesses of existing approaches with respect to their hydrologic validity; (4) recommendations for preserving ground water recharge in comparable terms for pre-mining "natural" and post-mining "restored" conditions; (5) identification of considerations, such as data requirements, design standards, mining methods, landscape, water quality effects, precipitation, and vegetation factors, that are relevant to analysis of hydrologic functions of mined locales; (6) identification of any research required to strengthen the recommended approach; and (7) recommendations for policy change, if warranted.

Price: £ 12.50

Orders to: John Wiley & Sons, 605 Third Avenue, New York NY 10158-0012, U.S.A. or: John Wiley & Sons, Baffins Lane, Chichester, West Sussex PO19 1UD, England.

Land Systems Map of the Republic of Botswana, with explanatory note. P.V. de Wit and R.P. Bekker. Soil Mapping and Advisory Services Project, Gaborone, 1990. 1 map, text pp.43. This map at a scale of 1:2 million depicts 86 land system units, grouped into 20 land regions and 5 land divisions. For all units information is given on the constituting vegetation type with dominant species - as given on the Vegetation Map at the same scale, published in 1991 - soils according to the system of the FAO-Unesco Soil Map of the World legend - as given on the National Soil Map of Botswana at 1:1 million scale, also published in 1990 - and the extent.

Orders to: all three maps and accompanying explanatory note mentioned above are available from: Chief Land Utilization Officer, Ministry of Agriculture, P.Bag 003, Gaborone, Botswana.

Dictionary of Soil Science. J. Lozet and C. Mathieu. Oxford and IBH Publishing Co.Pvt. Ltd., 1991, x + 348p. ISBN 90-5410-201-2. Hardback.

The 2nd edition of the "Dictionnaire de Science du Sol" has now been translated in English; it contains the definitions of nearly 2800 words relating to general soil science, mineralogy, petrology, micromorphology, geomorphology, and also to the major systems of classification.

The changes which have taken place in soil science in the last few years have been incorporated. To name the most important, there has been the work of the Subcommission on Soil Micromorphology of the International Society of Soil Science, the amendments to Soil Taxonomy, and the Revised Legend for the FAO-Unesco Soil Map of the World, in which the definition of the diagnostic horizons and properties have been revised. The authors also introduced or updated many other terms, particularly in mineralogy, agricultural hydrology, and surface hydrology. The present edition also includes the official translation of the soil classification of the Federal Republic of Germany, which is particularly interesting for semi-terrestrial and sub-aquatic soils.

This dictionary will not only be relevant to native English speakers but will certainly be of great interest to teachers, students, theoretical and applied scientists from all countries. A Russian translation is also in preparation.

Price: Hfl 87.

Orders to: Oxford and IBH Publishing Co.Pvt.Ltd., 66 Janpath, New Delhi, India. or: A.A. Balkema publishers, P.O.Box 1675, 3000 BR Rotterdam, the Netherlands.

Soils of the Tropics. Properties and Appraisal. A. van Wambeke. McGraw-Hill, New York, 1992, xiii + 343p. ISBN 0-07-067946-0.

This book features the most current data on the wide variety of soils found in tropical regions. It provides biologists, agronomists, and land-use managers with the information they need to make the right decisions regarding land use in tropical regions.

This book also provides coverage of chemical, physical, and mineralogical properties of each of the major soil orders according to Soil Taxonomy found in the tropics. It appraises the potential of each soil group for sustaining a renewable agricultural system, and then recommends the system most appropriate for that soil. It also has a useful glossary and the description and analytical data of nearly 20 profiles in the tropics. For professionals concerned with minimizing soil erosion, averting ecological destruction, or maximizing crop yields to meet the nutritional demands of an ever-growing population in the tropics, this book will prove to be indispensable.

Price: UK£ 42.95

Orders to: McGraw-Hill Book Company Europe, Shoppenhangers Road, Maidenhead, Berkshire, SL6 2QL, England; or: McGraw-Hill, Inc. 1221 Avenue of the Americas, New York, NY 10020, USA.

Migration Processes in the Soil and Groundwater Zone. L. Luckner and W.M. Schestakow. Lewis Publishers, Chelsea, 1991, xviii + 485p. ISBN 0-87371-302-8.

This book is a comprehensive work that integrates knowledge from physics, chemistry, biology, mathematics, geology, engineering, and other fields. Its purpose is to provide solution methods, techniques of parameter estimation, and tools for solving the complex problems of mathematical modelling. The book, augmented by 30 tables and over 150 illustrations, features discussions on the fundamentals of mathematical modelling of migration processes; analytical, numerical, and inverse solutions to migration problems; and techniques of parameter estimation and monitoring of migration processes.

This volume is meant for people involved in the areas of hydrogeology, soil science, environmental engineering, subsurface cleanup, water sciences, agronomy, land development, and civil engineering. Professionals gain a survey of the methodology of migration model building, the mathematical tools for solving these models, and the technique of parameter estimation in laboratories and in the field.

Price: US\$ 84.

Orders to: Lewis Publishers, Inc. 121 South Main Street, Chelsea, MI 48118, U.S.A.; or: CRC Press, London Office, 22-24 Torrington Place, London WC1E 7HJ, U.K.

Advances in Soil Science, Volume 16. B.A. Stewart, editor. Springer Verlag, New York, Berlin, 1991, ix + 240p. ISBN 0-387-97519-5 (U.S. edition), 3-540-97519-5 (German edition). Hardbound.

This series presents research summaries on aspects of soil science which are as diverse as the subject itself, and range through physical, chemical and biological approaches to the study of soils. The present volume contains articles dealing with the role of phosphorus in soil, modelling of chemical absorption in soils, tests to determine nutrient availability and element toxicity in soils, the effects of sewage sludge on soil microbes, and methods to estimate soil water retention based on physical properties of soil.

Price: DM 198

Orders to: Springer-Verlag, Heidelberger Platz 3, D-1000 Berlin 33, Germany; or: Springer-Verlag, 175 Fifth Avenue, New York NY 10010, U.S.A.

Farming, Fertilizers and the Nitrate Problem. T.M. Addiscott, A.P. Whitmore and D.S. Powelson. CAB International, Wallingford, 1991, vi + 170p. ISBN 0-85198-658-7. Paperback.

The excessive use of fertilizers in agriculture is generally assumed to be a major cause of nitrate pollution. Nitrates may leak through the soil and occur in excess levels in drinking water, threatening human health, or accumulate in rivers and seas, causing excessive algal growth and disturbing ecosystems.

The authors of this book provide a detailed scientific analysis of this controversial issue. They review the requirements of crop plants for nitrate, mechanisms of nitrate leakage and the evidence which shows that limiting fertilizer use is an over-simplistic solution to the problem. Changing crop production practices to "mop up" excess nitrate may be a better response. The book will have a wide audience among students, agricultural scientists and the lay person concerned with agriculture, pollution and the environment.

The book contains chapters on the following subjects: Nitrate: Perception of the problem; Nitrogen in crop production; The physics and chemistry of nitrate; The biology of nitrate leakage; Measuring nitrate losses from soil; Chasing nitrate with a computer: modelling; Sources of nitrate leakage (arable farming; grassland and organic farming); Some complications; Ways of reducing nitrate leaching.

Price: UK£ 12.95 (US\$ 25 for the Americas only)

Orders to: for the Americas: CAB International, 845 North Park Avenue, Tucson AZ 85719, USA. Elsewhere: CAB International, Wallingford, Oxon OX10 8DE, U.K.

Guide du Drainage Souterrain. Bulletin DVWK 18. R. Eggelsmann. Verlag Paul Parey, Hambourg, Berlin, 1991, xvi + 306p. ISBN 3-490-03590-9. Cartonné.

Cette deuxième édition, en partie abrégée, et enrichie des connaissances pratiques et théoriques récentes, inclut les aspects écologiques du drainage ainsi que les problèmes de drainage des lieux de décharge et des champs irrigués, de l'irrigation utilisant les eaux usées, des eaux usées domestiques et de l'échauffement du sol (agrotherme). Les chapitres sur les filtres hydrauliques, le drainage des régions exposées au risque de glissement, le drainage des terres marécageuses et les matériaux des drains, ont été élargis. Pour en faciliter l'usage, la présente édition comprend un index thématique détaillé.

Commandes à: DVWK e.V., Gluckstrasse 2, D-5300 Bonn 1, Allemagne.

Supplemental Irrigation in the Near East and North Africa. E.R. Perrier and A.B. Salkini (editors). Co-published with ICARDA. Kluwer Academic Publishers, Dordrecht, Boston, 1991, xxii + 611p. ISBN 0-7923-1007-1 (Paperback) 0-7923-1006-3 (Hardback).

Irrigation technology using the techniques of supplemental irrigation and water harvesting can alleviate climatic risk factors in arid and semi-arid region by increasing choices for soil and crop management which can stabilize crop water requirements and, therefore, yields. Supplemental irrigation is being developed in the Near East and North Africa; however, the level and extent of development have not been previously documented. A limited quantity of water in extended areas coincides with extensive use of marginal natural resources which must be related to possible economic benefits and costs. Within this text, supplemental irrigation is examined in detail from both technical and socio-economic perspectives to identify potential areas of improvement and development.

Price: Hfl 300.

Orders to: In U.S.A. and Canada: Kluwer Academic Publishers, 101 Philip Drive, Norwell, MA 02061, U.S.A. Elsewhere: Kluwer Academic Publ. Group, P.O. Box 322, 3300 AH Dordrecht, The Netherlands.

Dictionary of Agrophysics. (English, German, Spanish, French, Polish, Russian). Institute of Agrophysics, Lublin, 1991, 369p. ISBN 83-900347-0-0.

The aim of this dictionary is to cover the range of words and technical terms occurring in the field of agrophysics which deals with the physical processes of the soil-plant-atmosphere continuum and with physical properties of its components.

The dictionary contains 2804 numbered terms on the soil physical and physico-chemical properties and processes, main soil units, soil profile characteristics, main soil minerals, soil forming rocks, elements of geology, topography and climate, main annual field crops and morphological parts of the plant, specific methods and instrumentation and appendix with SI units.

The dictionary is divided in two parts. The first part contains the terms (in 6 languages) in

alphabetical order according to English alphabet, main soil units are also provided with FAO soil classification names; the second part consists of indexes of each language separately, except English.

Price: US\$ 42 (Paperback), US\$ 52 (Hardback).

Orders to: Institute of Agrophysics, Polish Academy of Sciences, P.O. Box 121, 20-280 Lublin, Poland.

Arid Ecosystems Interactions. UCAR Office for Interdisciplinary Earth Studies, Boulder, 1991, 81p.

This book reports the conclusions of an interdisciplinary workshop held in Boulder in October 1989. The workshop was organized to examine the research needs of ecosystems that are particularly sensitive to global environmental change. It followed a similar workshop and report on Arctic Interactions.

It is hoped that the arguments presented here will open the wider dialogue that can lead to organized research initiatives to address these pressing scientific questions. The answers will be of more than academic interest: there can be no doubt that these marginal lands will be the hardest hit, socially and economically, by impending global warming. They are also particularly vulnerable, for drylands have for decades lived under siege, around the world, by increasing pressures of land and water use. Nor can we lose sight of the fact that arid and semi-arid lands are both a cause and an effect of global environmental change.

Orders to: Office for Interdisciplinary Earth Studies, UCAR, P.O. Box 3000, Boulder, CO 80307, U.S.A.

The Role of Trees in Maintaining and Improving Soil Productivity. A Review of the Literature. J. Ingram. Technical Paper 279, Commonwealth Science Council, London, 1990, 39p. CSC(90)AGR-15. Paperback.

The role of trees in maintaining and improving soil productivity is considered central to the sustainability of many agroforestry systems. Do we know enough about the effects of trees on soils to quantify and value this role? This publication reviews some of the evidence and our current understanding of the mechanisms involved so that we can start to consider how the benefits from trees might be evaluated in economic terms.

Price: free of charge

Orders to: see below.

Amelioration of Soil by Trees. Technical Paper 222, Commonwealth Science Council, London, 1987, 139p. CSC(87)AGR-5. Paperback.

This book contains the Proceedings and Recommendations of a Project Planning Meeting on Amelioration of Soil by Trees, held in Kenya in November 1986. It includes (1) the reports of discussion sessions concerning aspects of experimentation relevant to implementation of the project, and (2) the project proposals from each country which have been revised in the light of discussion at the meeting.

Price: free of charge.

Orders to: Commonwealth Secretariat Publications, Marlborough House, London SW1Y 5HZ, U.K.

Chemistry and the Environment. The IUPAC Programme. International Union of Pure and Applied Chemistry, Oxford, 1990, 60p. Paperback.

The world community of chemists must play their part in helping to tackle environmental problems especially since chemical substances are the main indices of the negative effects of industry, energy consumption, transport and intensive agriculture upon natural ecosystems and man. There are a number of areas where chemists need to cooperate with scientists from other disciplines in order to make a positive contribution to the long term protection of life on Earth. These include: Development of new environmentally safe chemical products from raw materials; Reduction of existing levels of chemical pollutants in the atmosphere, water and land; Study

of the transformation of anthropogenic chemical substances in the environment; Prediction of the impact of chemical substances on ecosystems, man and climate.

To help achieve these humane aims, IUPAC decided to concentrate an important part of its efforts in the development and introduction of a programme on 'Chemistry and the Environment'. The first step in this programme was the preparation of an inventory of recent and ongoing IUPAC projects related to chemistry and the environment. This booklet, which provides summaries of these projects, is the outcome of this first step. The second objective of this programme is to stimulate IUPAC working groups, commissions and committees to initiate and develop further projects on chemistry and the environment.

Orders to: Information Officer, IUPAC Secretariat, Bank Court Chambers, 2-3 Pound Way, Templars Square, Cowley, Oxford OX4 3YF, U.K.

Soil Physics. Application under Stress Environments. Pakistan Agricultural Research Council, Islamabad, 1990, vii + 467p. ISBN 969-409-072-5. Paperback.

This book is the proceedings of an international symposium on "Applied Soil Physics in Stress Environments" convened in Islamabad in January 1989. The main objectives were: (1) To expose scientists in Pakistan to the role of soil physics in defining plant soil relations; (2) To review the results of soil physics research outside Pakistan which has enhanced crop production and is relevant to Pakistan; (3) To identify the relationship of soil physics to agronomic problems in Pakistan; and (4) To identify soil physics research needs in Pakistan. The symposium made recommendations related to measurements and methodology, prevention of water-logging, reclamation of salt-affected soils, models for erosion prediction, moisture conservation, irrigation management and human resource development and management.

Orders to: National Agricultural Research Council (NARC), Islamabad, Pakistan.

Miocene Paleosols and Ape Habitats of Pakistan and Kenya. Oxford Monographs on Geology and Geophysics N°19. G.J. Retallack. Oxford University Press, New York and Oxford, 1991, viii + 346p. ISBN 0-19-506002-4. Hardback.

Most of what we know about our apelike ancestors is based on collections of fossil apes from the Himalayan foothills of Pakistan and India and from the volcanic hills of south-western Kenya. The work reported here has focused on these important fossil sites. It is an attempt to travel back in time to the days well before human evolution, using as evidence for ancestral habitats the ancient soils on which these creatures lived and died. A paleosol, or fossil soil, is not only a distinctive bed in a sedimentary or volcanic sequence. It is also a trace fossil of an ancient ecosystem in the very place where it once flourished. An attempt at reconstructing the habitats of these Miocene apes is made in a final section of this book, but much also has been learned of the detailed appearance and composition of paleosols, and how paleosols are recognized and altered after burial.

Price: UK£ 50

Orders to: Oxford University Press, Walton Street, Oxford OX2 6DP, England; or: Oxford University Press, 200 Madison Avenue, New York NY 10016, U.S.A.

Kjeldahl Method for Nitrogen Determination. J. Benton Jones, Jr. Micro-Macro Publishing, Athens, 1991, v + 79p. ISBN 1-878148-002. Paperback.

This book describes the Kjeldahl nitrogen determination method, giving its development history since 1883 and details how the method has evolved to its present use in many analytical laboratories. Included are detailed descriptions of 25 Kjeldahl methods for the analysis of soils, plant tissue, food products, fertilizers, and water as well as three procedures for the determination of generated ammonium. A bibliography on Kjeldahl literature since 1965 is also included. Several non-Kjeldahl methods of nitrogen determination are also described.

Price: US\$ 29.95. Advanced payment required.

Orders to: see below.

New Journals/Nouveaux Périodiques/Neue Zeitschriften

Rural Development in Practice. T. Scarlett-Epstein, editor. RWAL Publications, Quarterly. ISSN 0954-8777.

This international journal is intended to further the dissemination of important rural development knowledge. It will focus on the practical aspects of rural development, not the theoretical. This journal is to provide the means whereby the many people directly concerned in the planning and implementation of rural development projects and programmes may share their experience and express their opinion. It will establish a multi-dimensional channel of communication between development personnel operating in different socio-economic environments, and between development personnel and the development service industries, and provide a forum for discussion of the practical issues which are of the utmost concern to rural development practitioners. It is not to be a top-down journal.

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Orders to: RWAL Publications, Lloyds Bank Chambers, 15 Devonshire Road, Bexhill-on-sea, East Sussex TN40 1AH, United Kingdom.

Journal of Applied Aquaculture. Quarterly published by Food Products Press. D. Tave, editor. ISSN 1045-4438.

The journal will emphasize applied research, but important developments and breakthroughs in basic research which will further aquaculture will be accepted. It will also publish notes that describe new pieces of equipment or new techniques, as well as process papers. "Experiences" papers which describe new or unusual phenomena that can lead to further research or development will be presented as well.

Subscription price: US\$ 28 for individuals, US\$ 48 for institutions, US\$ 75 for libraries and subscription agencies. For all orders outside the USA, 40% in addition.

Orders to: Subscription Department, The Haworth Press Inc., 10 Alice Street, Binghamton, NY 13904-1580, USA.

Tomorrow. The Global Environment Magazine. Quarterly published by Tomorrow Media, Stockholm. Claes Sjöberg, editor-in-chief. ISSN 1102-0938.

If the world is to achieve the goal of sustainable development, significant changes must be made in transportation, industry, population growth, and energy use. These changes will not occur by themselves, and information can play an important role in this process.

The journal is aimed primarily at policy makers: engaged and informed people in business, government, media, scientific institutes and environmental organizations.

Subscription price: US\$ 48.

Orders to: Tomorrow Media, Kungsgatan 27, S-111 56 Stockholm, Sweden.

Mycorrhiza. Quarterly published by Springer-Verlag. W. Jülich, editor-in-chief. ISSN: pending.

This is an international journal devoted to all aspects of mycorrhizal research, i.e. the symbiosis between higher plants and certain fungi or mushrooms.

About 90% of all flowering plants on earth form mycorrhizae; endomycorrhizae are common in grasses, crops and fruit trees, whereas ectomycorrhizae are present in all forest trees of the northern hemisphere and certain tropical tree families. As a result, research on mycorrhizae is of great interest to researchers in numerous, varying fields.

This journal contains original papers, review articles and short notes, and will form a platform for discussions of new concepts, as well as a basis for an International Association of Mycorrhizologists.

Subscription price: Volume I (4 issues) DM 320, plus carriage (FRG: DM 7,06; other countries: DM 13,40).

Orders to: Springer-Verlag, Heidelberger Platz 3, D-1000 Berlin 33, Fed.Rep. of Germany.

Tropical Science. An International Journal of Science, Technology and Economics applied to Renewable Natural Resources Development. Quarterly published by Whurr Publishers, London. P.C. Spensley, editor-in-chief. ISSN 0041-3291.

This Journal is embarking on a gradual transformation, focused on three directions. The first one is that the Journal is going to be larger. Secondly, the subject scope is broadening; the aim is that this publication should become a vehicle for the communication of new science, technology and economics of practical value to the whole business of exploiting renewable natural resources in the tropics and sub-tropics, and particularly in developing countries. The third element of change concerns the type of papers to be published. Whilst contribution describing new applied research, or reviewing recent work, will remain the backbone of the Journal, it is felt there is a need to encourage the dissemination of information about the application of new knowledge, procedures and ideas in actual, natural resources development projects on the ground. These projects will often be multidisciplinary and the experience gained could be of value to other groups engaged with similar tasks.

Subscription price: US\$ 110; £ 59 (1 volume of 4 issues)

Orders to: Whurr Publishers, Distribution Centre, Blackhorse Road, Letchworth, Herts, SG6 1HN, U.K.

Georgicon for Agriculture. Published twice a year by the Faculty of Agricultural Sciences, Keszthely. L. Vincze, president of Editorial Board. ISBN 7742 61 1.

This is the new version of the former Bulletin of Agriculture of the Faculty of Agricultural Sciences. It will give account of the results of research achieved by the specialists from the faculty and from research institute and universities co-operating with the university. At the same time, it will bring some of the most interesting lectures read at scientific conferences organized at the university.

Requests to: Faculty of Agricultural Sciences, University of Agriculture, 8361 Keszthely PF. 71, Hungary.

EnvironMetrics. Quarterly published by John Wiley. A.H. El-Shaarawi and I.B. MacNeill, editors. ISSN 1180-4009.

This multidisciplinary journal is concerned with the development and application of statistical methodology in the environmental sciences. The scope covers a wide range of methodological topics including sampling design, statistical modelling, methods of data analysis and interpretation, statistical quality control, risk assessment, time series methods, multivariate analysis, and other statistical methods with application to such areas as: water and air quality; regulation and control; waste management; transboundary pollution, health aspects of pollution; risk analysis; monitoring; field and laboratory quality control; climatic change.

In addition to publishing significant research papers, this journal published review and survey papers in the aforementioned areas, and articles on algorithms and computer software relevant to environmetrics.

Subscription price: US\$ 225

Orders to: See below.

Soil Analysis. Modern Instrumental Techniques. Second edition. Books in Soils, Plants and the Environment. K.A. Smith, editor. Marcel Dekker, New York, Basel, 1991, viii + 659 p. ISBN 0-8247-8355-7. Hardbound.

The theme of this revised and enlarged second edition is the same as that of the first edition, that is, to fill the gap between books covering traditional methods of analysis and specialist monographs on individual instrumental techniques, which are usually not written with soil or plant analysis specifically in mind. The principles of the techniques are combined with discussions of sample preparation and matrix problems, and critical reviews of applications in soil science and related disciplines.

In the 7 years since the Preface to the first edition was written, there have been many developments in the instrumental techniques applied to the analysis of soils and other

environmental materials. Some techniques that were not used widely enough to merit inclusion in the first edition have become of much greater significance. For example, inductively coupled plasma (ICP) spectrometry has now become the favoured technique for routine multielement analysis in major soil- and plant-testing laboratories. Another new inclusion is the chapter on ion chromatography, which has married the long-established procedures of ion-exchange separation to the technology of high-pressure liquid chromatography to provide a powerful way of determining ionic species in solution, especially anions which were, hitherto, difficult to measure. The last new addition is the chapter on analysis of soil functional groups by NMR spectroscopy. This is a developing area, which seems destined to expand as equipment and awareness of its potential become more widespread.

All 11 chapters of the first edition are retained in revised form. The scale of the revisions varies. One general feature of the revisions is the extent to which microprocessor control systems feature in the descriptions of the current generation of instruments. The explosive growth of microprocessors in instrumental control and operation, in all forms of analysis, and concurrent developments in software for data analysis and microcomputers for running that software, are the most significant new features of the field. Not only has the sophistication of what can be done increased greatly, but the cost for doing it has fallen dramatically in real terms.

This book is aimed at the researcher working in soil science or a related field who is faced with the problem of making a new determination, or replacing old analytical equipment to make a routine determination more accurately or more efficiently.

The book will help in evaluating the available techniques so that the optimum choice in terms of speed, cost, or sensitivity may be selected. It will also be useful to teachers and students of post-graduate courses in soil chemistry and soil analysis.

Price: US\$ 150 in U.S.A. and Canada; US\$ 180 elsewhere.

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Soil Analysis, Physical Methods. Books in Soils, Plants and the Environment. K.A. Smith and C.E. Mullins, editors. Marcel Dekker, New York, Basel, 1991, viii + 620 p. ISBN 0-8247-8361-1. Hardbound.

In soil physics more than in most subjects there has been a strong symbiotic relationship between the development of theory and practical applications on the one hand and the development of experimental methods on the other. Over the past 20 years, the development of the neutron probe, which allows rapid nondestructive field measurement of soil water content, has led to an enormous upsurge of interest in soil water measurements and their practical applications and to the accelerated development of the theory of soil water movement. In comparison with soil chemistry and mineralogy, the development of techniques for soil physical measurements has been held back by the necessity for many measurements to be carried out in the field. Other techniques that require reliable "undisturbed" cores or samples on which to make laboratory measurements have also required considerable time and experience to perfect. However, the detailed specification of a number of soil physical measurement techniques, which is currently being undertaken by the Soil Quality working group of the International Standards Organisation, is an indication of both the increasing importance of soil physical measurements and the coming of age of an number of physical measurement methods. These methods can be regarded as being relatively stable, in the sense that their limitations, reliability, and areas of application are now well established.

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