



bulletin

of the international society of soil science

bulletin

de l'association internationale de la science du sol

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boletín

de la sociedad internacional de la ciencia del suelo

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**INTERNATIONAL SOCIETY OF SOIL SCIENCE
ASSOCIATION INTERNATIONALE DE LA SCIENCE DU SOL
INTERNATIONALE BODENKUNDLICHE GESELLSCHAFT**

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Notificación
**XI CONGRESO LATINOAMERICANO Y II CONGRESO CUBANO DE
 CIENCIA DEL SUELO**

La Habana, Cuba, 11 al 17 de marzo de 1990

Programa Preliminar por Simposios: N°1: Degradación de los suelos ocasionados por su uso agrícola (con énfasis en Salinidad); N°2: Problemas actuales sobre Génesis y Clasificación de Suelos Tropicales; N°3: Sistemas de información de suelos en Latinoamérica; N°4: Métodos biológicos de mejoramiento de la fertilidad de los suelos; N°5: Problemas actuales de la fertilidad de los suelos y el uso de los fertilizantes como factor de intensificación de la producción agrícola.

Programa científico: La sesiones de evento estarán organizadas en 8 grupos de trabajo, los cuales incluirán todas las actividades afines en forma de conferencias, mesas redondas y simposios, así como temas libres (paneles demostrativos); esta última modalidad será preferida.

Grupos de Trabajo: I. Química de Suelos; II. Física de Suelos; III. Biología de Suelos; IV. Génesis, clasificación y cartografía de suelos; V. Recursos hídricos en la producción de las plantas. Interacción entre agua (Riego y Denaje) y suministro de nutrientes; VI. Evaluación de la fertilidad de los suelos y uso de los fertilizantes en los cultivos principales; VII. Erosión, conservación y mejoramiento y técnicas de manejo de suelos; VIII. Sistemas automatizados y técnicas de teledetección aplicadas a los estudios y evaluación de los suelos.

Giras técnicas simultaneas con los congresos: N°1: Manejo de Suelos Bajo cultivo de Cítricos; N°2: Manejo de Suelos y uso de los fertilizantes bajo cultivo intensivo con caña de Azúcar; N°3: Manejo de suelos bajo cultivo intensivo de pastos; N°4: Visita a los centros de Investigación relacionados con el estudio de Ciencia del Suelo; N°5: Descripción de perfiles típicos de suelos tropicales.

Giras Post-Congresos: 1. Identificación y manejo de Suelos montañosos bajo Cultivo del Café; 2. Identificación de Suelos Salinos y Vertisuelos de Cuba; 3. Identificación de Suelos Feralíticos cuarcíticos amarillentos (Ultisoles); 4. Identificación de Suelos Arenosos poco evolucionados (Entisoles) bajo Cultivo del Tabaco.

Idioma oficial: Español. Se dispondrá de traducción simultánea al inglés si el número de asistentes así lo sugiere.

Cuotas de Inscripción: Delegados: US\$ 100.00, incluye: participación en apertura, sesiones de trabajo y clausura del evento, credencial, documentación y certificado de asistencia. Acompañantes: US\$ 50.00, incluye: Participación en apertura y clausura del evento, bolsa con souvenirs y credencial.

Correspondencia:

XI Congreso Latinoamericano y II Congreso Cubano de la Ciencia del Suelo

Palacio de las Convenciones, Apartado 16046, La Habana, Cuba. Teléfonos: 22-5511 al 19, Télex: 511609 palco cu; Fax: 22-8382.

PLANILLA DE SOLICITUD DE PRESENTACION DE TRABAJOS
 XI Congreso Latinoamericano y II Congreso Cubano de la Ciencia del Suelo
 11 al 17 de marzo de 1990

Por favor enviar esta solicitud antes del 30 DE SEPTIEMBRE de 1989 a la siguiente dirección: Ing. Rafael Villegas Delgado, CDr., Vicepresidente Comité Organizador, XI Congreso Latinoamericano de Ciencia del Suelo, Ave Van Troi # 17203, Boyeros, Apartado Postal 10800, Ciudad de La Habana, Cuba.

Prof./Dr./Ph.D./Sr./Sra.

Institución:

Dirección:

Personas acompañantes: Si No

Especialidad:

Presentación de trabajos: Si No

Título(s):

Deseo que mi trabajo se presente en calidad de:

Poster Comunicación oral

En el grupo: En el Simposio:

Deseo reservar participación en la gira técnica:

Deseo reservar participación en las giras post-congresos:

**REPORTS OF MEETINGS
COMPTE-RENDU DE REUNIONS
BERICHTE VON TAGUNGEN**

INTERNATIONAL SYMPOSIUM ON MANAGING SANDY SOILS
Jodhpur, India, February 6-10, 1989

The symposium was held at the Central Arid Zone Research Institute. Sponsors included the International Society of Soil Science, Indian Society of Soil Science, Indian Council of Agricultural Research, and the Arid Zone Research Association of India. Approximately 200 participants attended representing 19 countries. Six invited keynote papers and 135 volunteered papers addressed relevant topics including 1) the extent, characteristics, and patterns of agricultural use of sandy soils in major land areas; 2) soil and nutrient management strategies for optimizing use of resources and potential of sandy soils for production of field and horticulture crops, pastures, and woody plants; and 3) conservation options to improve the efficiency of water use and control of degradation of sandy soils. In general, the presentations emphasized management oriented themes and covered both dryland and irrigated agriculture.

It was emphasized that sandy soils occur in diverse environments and are subject to a wide range of management practices. These soils vary considerably in their physical and mineralogical properties and are often found in fragile ecosystems where climatic extremes and plant stress factors can lead to more rapid degradation than with most finer textured soils. In the past many sandy soils have not been considered as suitable for cultivation and their use was limited mainly to animal grazing. As a result their development for the production of food, animal fodder, and horticultural crops was ignored. With current demands for increasing food and fibre production, large tracts of land are undergoing agricultural development with the use of conventional farming practices. Consequently overgrazing and soil erosion are adversely affecting soil productivity and leading to offsite damage. Limitations for arable use of these soils include low water retention capacity, irrigation efficiency, soil organic matter, and nutrient supply; high potential for nutrient leaching; and the high cost of technology to increase water and nutrient use efficiency under irrigation. A number of papers emphasized that proper management of these sandy soils is absolutely essential to their sustainability for the production of cultivated crops.

Sandy soil areas and associated agroclimatic zones have not been well mapped and studies on the effect of management levels on production efficiency and land degradation are limited. Various studies have demonstrated the benefits of reduced tillage and surface mulches for improving the soil physical environment which is reflected in higher crop yields and better erosion control. It was also reported that nitrogen-fixing legumes in crop rotations could reduce the need for nitrogen fertilizer by a following grain crop by 25 percent or more. Several studies left questions as to why higher yields were not being achieved with full irrigation of cereals and other crops, compared with dryland or rainfed systems.

Considerable success has been achieved through research in the development of more appropriate technologies and more effective alternate land use systems including agroforestry, silvi-pastoral, alley farming, and agro-horticulture. These have great potential for biological enhancement of soil fertility and stabilizing the soils against wind and water erosion. It appears plausible that in marginal areas where intensive crop cultivation cannot be sustained, greater efforts should be made to establish trees and shrubs for fuel and fodder, and grasses or legumes to enhance animal production. Adaptive research is needed, especially on farmers fields, to demonstrate the usefulness

and potential value of these practices on marginal and degraded lands.

The symposium emphasized the need for well-designed studies using a systems approach to optimize the development of management systems for sandy soils that will ensure their long-term sustainability. The question of balancing crop residue use for animal feed and soil improvement, and long-term protection of the soil also needs to be studied. A strong consensus of the symposium participants was that more research is needed to improve irrigation water management on sandy soils to minimize salinization and to enhance the efficient use of water and fertilizer. The participants also recognized the need for testing and adaptation of improved implements and equipment for soil tillage as well as precision placement of seed and fertilizer.

R.I. Papendick, Washington DC, U.S.A

INTERNATIONAL SYMPOSIUM ON SOLONETZ SOILS
PROBLEMS, PROPERTIES, UTILIZATION
Osijek, Yugoslavia, June 15-10, 1988

The Subcommittee on Salt-Affected Soils of the International Society of Soil Science, The Yugoslav Society of Soil Science and the Agricultural Faculty of the University of Osijek organized the Symposium on Solonetz Soils – Problems, Properties, Utilization – at Osijek at the Dom željeznica (Guest-house of the Yugoslav Railway).

The Symposium was attended by 70 participants, representing 15 countries (Brazil, China, Colombia, Fed. Rep. of Germany, Hungary, India, Iraq, Italy, Israel, the Soviet Union, Spain, Switzerland, Thailand, USA, Yugoslavia) and the ISSS.

On 14th June the registration of participants and preliminary discussions took place in Osijek and on 15th June, after a short morning visit to the Agricultural Faculty, the Opening Ceremony was held, where the authorities of the State and City, the Yugoslav Soil Science Society and the University of Osijek addressed the meeting, which was followed by four plenary lectures on solonetz soils and methods of research, as well as cartography of different salt-affected soils.

A total of 22 papers were delivered on the properties, genesis, classification, reclamation, utilization, irrigation, measurement and mapping of solonetz and other salt-affected soils. Concurrently, 6 posters were exhibited.

The papers, which were published in full-length in the Proceedings of the Symposium (375 pages) were distributed among the participants before the Symposium.

On the afternoon of 16th June, the participants took part on a professional excursion to salt-affected areas in Vojvodina.

The presented papers and discussions covered practically the whole range of problems encountered with solonetz soils, and also several problems of other salt-affected soils. Different opinions were expressed, mainly on the criteria and diagnostics of different salt-affected soils, as well as on the experimental methods and evaluation of data during analytical procedure.

At the business meeting of the Subcommittee on 17th June, the following recommendations were accepted unanimously:

1. For the XIVth Congress a plenary lecture was proposed on the topic of salt-affected soils, in response to the world-wide significance of this problem. Proposed titles discussed were:
 - ‘Recent problems and prospects of salt-affected soils’;
 - ‘Irrigation and salinization recently and after the year 2000’;
 - ‘Soil salinization as one of the main factors of land degradation – hazard and possibilities of prediction, prevention and remedy’.

2. Also for the XIVth Congress, a separate symposium on the problems of salt-affected soils was recommended. Possible titles:
 - ‘Application of new methods, technics (computers, remote sensing, etc.) and modern education for better utilization of salt-affected soils’;
 - ‘Chemical, physical and biological properties of salt-affected soils’.
3. Suggested titles for the next symposiums of the Subcommission:
 - A. October, 1989, Nanjing, China: ‘Prediction of secondary salinization based on the process of salt and water movement’ organized by the Institute of Soil Science, Academia Sinica, Nanjing, China.
 - B. January, 1992, Bangkok, Thailand: ‘Strategies for utilizing salt-affected lands’ organized by Land Development Department, Bangkok, Thailand.
4. The participants agreed on the necessity of a handbook on soil salinity and alkalinity, produced with the collaboration of a broad circle of international experts and with the participation of the Subcommission on Salt-Affected Soils at editing stage.

Following the Symposium, a visit was organized to a bird sanctuary, and a three-day excursion took place on the route Sarajevo-Mostar-Dubrovnik with the demonstration of coastal salt-affected soils, as well as achievements in agri- and silviculture, and last but not least, the natural and historical sights.

The participants of the Symposium expressed their thanks to the hosts, particularly to the Yugoslav Soil Science Society, the University of Osijek and the Organizing Committee, headed by Prof. M. Adam, for the excellent preparation and conduct of the Symposium and for the exceptional hospitality which was offered to the guests.

I. Szabolcs, Budapest, Hungary.

INTERNATIONAL SCIENTIFIC CONFERENCE ON SOIL CLASSIFICATION *Alma-Ata, USSR, September 12-18, 1988*

The aim of the conference was to review the state of soil classification in order to pool world knowledge and experience as well as to identify a common nomenclature for the soils of the world. The Conference was organised, on the initiative of Commission V of ISSS, by the All Union Society of Soil Science of the USSR in Alma Ata, capital of Kazakhstan, at the premises of the Institute of Soil Science and Agrochemistry of the Kazakhstan Academy of Science. There were about 150 participants, of which about 50 from outside the USSR: India, Syria, Morocco, Malaysia, Indonesia, Thailand, Ghana, Czechoslovakia, Poland, GDR, Belgium, Netherlands, France, Japan, Finland, USA, FRG, Bulgaria, Hungary, Romania, China, Cuba. ISSS and FAO were also represented. Members of the ISSS Executive Committee and of the IRB Core Group also participated in the Conference and it was immediately followed by their own respective working meetings at the same place. The United Nations Environment Programme (UNEP, Nairobi) provided funds for the participation of a number of third world scientists.

The Conference was opened by Prof. G.V. Dobrovolsky, who pointed out the urgent need for a compensive and generally accepted soil classification in view of the environmental and economic problems of the world. After the opening by Prof. G.V. Dobrovolski on behalf of AUSSS and Prof. A. Tanaka on behalf of ISSS, Dr. M.F. Purnell was the first speaker. He introduced a new development of the FAO legend for soil mapping at the third level, also the reorganization of some existing units of the legend. The new legend currently has a limited distribution but it will be published by FAO in the very near future.



Participants of the Alma-ata international soil classification conference, september 1988.

Dr. Ruellan talked about the activities of a working group on a new French soil classification system emphasizing different groups of characteristics, the vegetation cover, the vertical and lateral changes in the landscape.

Dr. R. W. Arnold presented an account of the structure of the USDA Soil Taxonomy and the present effort to improve the system by the elaboration of the new Order of Andisols and the different activities of the International Committees (ICOM's) involved in the improvement of the system through the Soil Management Support Service (SMSS) Programme.

Dr. Gong Zitong presented the taxonomic classification adopted in China for soils and soil conditions of that country.

A great number of Soviet soil scientists expanded on the different aspects of soil classifications in the USSR such as the zonality, geographical, and climatological aspects, stressing the need to make available all detailed information on soils, their chemical, physical, biological, mineralogical and anthropomorphological properties.

Other speakers presented accounts of their activities at the national and regional level, highlighting the different problems encountered in soil classification and mapping.

Dr. R. Dudal, after a brief historical development of soil science, expressed the need to develop a common, international reference base system and he presented a list of soil attributes, assembling all possible types of soil profile development. These attributes could be described in terms of their characteristics, assemblages of characteristics, horizons, pedons and associations.

Following the meeting, a two day field tour was organized in different climatic zones and four soils were discussed and classified according to the different systems. Divergences in concepts and thinking between countries and within country scientists reflected the urgent need of the development of the international reference base system that was discussed during a special session at the end of the conference.

A.M. Osman, Damascus, Syria

FIRST INTERNATIONAL SYMPOSIUM ON PADDY SOIL FERTILITY *Chiangmai, Thailand, December 6-13, 1988*

The symposium was attended by 179 participants from 15 countries. Seventy one technical papers were presented during the session, plus 5 poster papers. The subject covered was rather broad but this was inevitable considering the theme of the Symposium. The outcome of the Symposium achieved the following objectives set by the organizing committee: (1) to review and exchange research information on paddy soils; (2) to clarify basic problems of paddy soils; and (3) to introduce effective paddy soil management procedures that lead to sustainable fertility.

Despite the success of the Symposium, several points needed to be resolved for the future progress of science and technology of paddy soil fertility: (1) The site of experiments on paddy soil fertility must be characterized properly and systematically based on an international system of classification; (2) Many specific researches reported in the sessions had little or no relationship between them. For instance, basic research has not been related to farmer's field problems. Biological problems have not been related to physical and chemical problems; (3) Problems of soil management were not fully discussed and it was suggested that this matter should be tackled in the future; and (4) Biological and biochemical problems, including the problem of soil organic matter still remain little studied in spite of the fact that almost all soil scientists working on paddy soil fertility are now becoming more interested in these two aspects. Further research in those fields should be encouraged.

A business meeting was organized by delegates from the different countries represented and international organizations. The meeting reached the following agreement: (1) The Second Symposium will be organized in 1990 in Kyoto, Japan during the 14th International Congress of Soil Science. This Second Symposium will be devoted entirely to the discussion of the fate of nitrogen in paddy fields; and (2) A Third Symposium will be organized two years after the Second one and the delegate from the People Republic of China graciously accepted the request to organize it.

The success of the First International Symposium, coupled with the establishment of the need for further research in the field of paddy soil fertility encouraged the participants to suggest that a request be submitted to the Secretary General of the ISSS to upgrade the Working Group on Paddy Soil Fertility to a Subcommission status.

S. Panichapong, Bangkok, Thailand

INTERNATIONAL WORKSHOP ON MULTIPURPOSE USE OF SOIL SURVEY INFORMATION (IWOMUSSI)

Nairobi, Kenya, March 13-16, 1989

The International Workshop on Multipurpose Use of Soil Survey Information was co-organized by Commission V of ISSS. It consisted of technical sessions, each with an invited keynote paper and several other papers, generally case studies, grouped by broad subject.

Subjects included: Multipurpose use of soil survey information for efficient land use management; Cost effectiveness of soil survey information; Soil database for transfer of farming system technology in Africa; Soil surveys for specific uses; Designing soil surveys for rainfed agriculture, for irrigated wildlife management, for forestry and agroforestry, for nonagricultural uses; Soil-weather-crop modelling; Geographic soil information systems; and soil survey information for soil management networks.

Four working groups discussed soil survey information for quantifying land evaluation; Computerization of soil survey information; Effective communication of soil survey information for users; Farming systems research and development.

The workshop was a learning and information exchange experience. There was a consensus that soil surveys should serve the needs of resource-poor farmers. Because there was little evidence that this was achieved in African countries, a new thrust was needed. Packaging soil survey information for users is difficult in many countries; information systems can help. Database technology, however, poses new demands on soil survey information. The need for farm-level mapping is growing, but institutions, accepted procedures and resources for this are not yet in place. Systematic national soil survey programmes are needed, since sustainable agricultural development requires soil survey information. This message should be taken to decision-makers.

There were a number of recommendations from the working groups and from the workshop as a whole. These covered the establishment of an African soil research institute, in view of the constraints faced by national institutes in Africa; soil resource inventories that should provide information at farm level (which would probably require active cooperation between farmers themselves and soil scientists); a training course in Africa on agro-ecological zoning methods and land suitability classification; a workshop to develop guidelines for soil and geographic information systems.

A half-day mid-workshop field trip and a cultural evening enriched the experience of especially the foreign participants. A four-day field tour through a major part of the Kenyan landscapes followed the workshop for many of the participants. Both the organisers and the organizations that supported the workshop in different ways are complimented with the success of the meeting.

R. Brinkman, Rome, Italy

INTERNATIONAL WORKSHOP ON
DENITRIFICATION IN SOIL, RHIZOSPHERE AND AQUIFER
Giessen, FRG, March 17-19, 1989

The workshop was patronized by Commissions II and VI of the ISSS and by Commission III of the German Society of Soil Science. It was organized by J.C.G. Ottow and G. Benckiser (Giessen), N.N. Goswami (New Delhi), R.K. Thauer (Marburg) and G. Trolldenier (Hannover). It was sectioned into: 1. Methods to quantify denitrification losses in situ; 2. Sink and source mechanism of denitrification products; 3. Eco-physiology and kinetics of denitrification; 4. Ecological effects on regulation and on products of denitrification losses; 5. Effect of manuring and fertilization on denitrification losses; 6. Conditions and mechanisms of denitrification in subsoil and aquifer; 7. Direct and indirect effects of plants on denitrification; and 8. Modelling of denitrification.

Each section was initiated by one or two invited papers and was followed by a number of voluntary contributions. More than 30 posters were presented and contributed additionally to the topics of the different sections. About 180 scientists from many countries of the world participated at this condensed workshop, lasting only three days. It was excellently organized and the great number of participants and contributions underlined the great demand of information about the denitrification process and its importance in the nitrogen cycle.

Although the denitrification process and the microorganisms involved are reasonably well explored in the laboratory, its contribution from and its impacts on different ecological systems such as soils, subsoils, aquifers or aqueous systems are still not well explored. There seems to be at least some agreement that denitrification in arable soils of the temperate climate is generally too small to cause elimination of the nitrogen applied as fertilizer and not being removed by crops. In cropped fields of the arid region under irrigation or in the tropics denitrification occurs at a higher rate. Also in rice fields denitrification seems to be high, although measurements of the gaseous losses are much lower than measured ^{15}N -balance losses. This difference can be explained by additional NH_3 -losses, but more probably by a strong trapping of N_2 and N_2O in the soil.

Exact estimations of the denitrification losses from surfaces are hampered by a great spatial and temporal variability of the denitrification rates. These variabilities are especially high in arable soils due to water saturated aggregates interspersed with well aerated zones. Modelling of denitrification in field plots is therefore complicated and needs the consideration of 'hotspots' or microsites of high biological activity in order to get more realistic models. Denitrification in the unsaturated and saturated zones of soil in water catchment areas and in aquifers are a problem of increasing importance due to the more and more observed NO_3 -contamination of ground waters. Therefore co-infiltrated dissolved organic carbon, adsorbed organic matter, reduced sulphur or iron compounds are of great significance for the reduction of nitrate in groundwater. Permanent reduction of nitrate will cause an irreversible consumption of the reducing compounds and the capacity of 'self cleaning' will be diminished.

The symposium underlined the many aspects of the denitrification process, but also made clear that our knowledge about rates and amounts of reduced nitrate even on land are still inadequate. An own session about future research needs at the end of the symposium also pointed out that there are still many questions waiting for a better answer. The contributions will be published in the 'Mitteilungen der Deutschen Bodenkundlichen Gesellschaft'.

K. Haider, Braunschweig, FRG

FIRST AFRICAN SOIL SCIENCE SOCIETY CONFERENCE

Kampala, Uganda, December 5-10, 1988

The purpose of the conference was as follows: (1) Ratify the constitution of the African Soil Science Society and to elect the officials of the Society; (2) Evaluate the extent of soil degradation in Africa; (3) Determine state-of-the-art techniques for managing soil degradation; and (4) Report on current research and future approaches to managing soil degradation.

The conference was opened by the President of Uganda and closed by the Prime Minister of Uganda. It was attended by about 187 participants representing 20 African countries, 6 countries outside Africa and 15 international organizations. About 110 participants came from Uganda.

Some 80 papers, covering various fields such as agroclimatology, desertification, erosion and soil conservation, agroforestry, farming systems and case studies with respect to specific soils, were presented. There were also two full day field trips, one in the middle of the conference and the other at the end of the conference, during which farms and Agricultural Research Stations were visited and soils and land use problems discussed. There was further a four-day post-conference field trip to Kabale which is near the border with Rwanda, and which lies south-west of the City of Kampala. The time allocated for the presentation of papers was limited and more time could have been secured if a poster session was also run. The conference field trips were however most stimulating with much discussions on soil genesis, classification, land use and farmer problems.

At the business meeting of the society, a number of practical recommendations were made to the African governments, the African Soil Scientists, the African farmers and the African Regional Organizations (Organization of African Unity, OAU and Economic Commission for Africa, ECA). Also the constitution of the African Soil Science Society was ratified and the officials of the Society were elected.

N.N. Nyandat, Nairobi, Kenya

PREMIER SEMINAIRE FRANCO-AFRICAINE DE PEDOLOGIE TROPICALE (SOLTROP 89)

Lomé, Togo, 6-12 février 1989

'Les sols tropicaux: bien les connaître pour mieux les utiliser'

Le Premier Séminaire Franco-Africain de Pédologie Tropicale a été organisé sous la responsabilité de Georges Pedro, conjointement par l'ORSTOM et l'Université du Bénin (Togo). Il avait pour but de faire le point des connaissances actuelles sur les sols tropicaux et leur aménagement. SOLTROP 89 a regroupé au Togo 52 pédologues africains de 18 pays, 22 chercheurs européens et des représentants de la FAO, du Bureau Inter-africain des sols (OUA), de l'ITTA et de l'IBSRAM.

Les trois premiers jours ont été consacrés à des exposés et à des discussions en salle, complétés par des échanges autour d'une trentaine de posters. Les travaux étaient articulés autour de 5 thèmes: Organisation des sols dans le paysage; Aspect actuel de la connaissance des sols à différentes échelles; Caractérisation des sols sous culture; Fonctionnement des sols et alimentation des plantes; et Evaluation des terres pour la mise en culture.

Une excursion de trois jours a ensuite conduit les participants jusqu'à Kara, la grande ville du nord du pays, avec des arrêts sur quatre sites ayant fait l'objet d'une caractérisation approfondie.

La synthèse réalisée le dernier jour a permis de dresser le bilan de ce séminaire. Il peut être résumé en trois points:

- 'Bien connaître les sols pour mieux les utiliser', c'est en premier lieu dépasser les problèmes de classification, pour effectuer une compartimentation pédologique de l'espace qui soit fondée sur des limites naturelles. La classification peut être utilisée pour transférer des connaissances, mais seulement à l'issue du travail de caractérisation.
- Les sols africains présentent une forte structure spatiale à différentes échelles. La compréhension des paysages pédologiques passe par l'étude de l'organisation et du fonctionnement de toposéquences représentatives, qui constituent des systèmes en nombre limité à l'échelle du continent.
- Enfin, 'bien connaître les sols', c'est dépasser les divisions anciennes de la Science des Sols pour prôner une conception globale de l'objet d'étude. Cela implique nécessairement une évolution progressive des mentalités, que l'approche actuelle est tout à fait à même de réaliser.

Pour l'avenir, les participants ont préconisé de mettre l'accent sur les zones forestières humides, qui restent encore insuffisamment connues, et sur la valorisation des nombreuses études réalisées en régions soudaniennes et sahéliennes, à l'aide en particulier d'ateliers de terrain à organiser dans les différents pays concernés.

R. Poss, Lomé, Togo

MAXIMUM YIELD RESEARCH SYMPOSIUM

New Delhi, India, 16-18 November, 1988

The Potash & Phosphate Institute of Canada in collaboration with Potash Research Institute of India organized a symposium on Maximum Yield Research from Nov. 16 to 18, 1988 at New Delhi, India. The idea of this symposium took birth soon after the symposium on Potassium in Agriculture was held at Atlanta, Ga, USA, in 1985. Scientists from USA, Canada, Pakistan, Bangladesh, China, Japan, Taiwan, Hong-Kong, Philippines, Thailand, Malaysia and India participated. In total, 4 review papers and 15 scientific research papers were presented. The Maximum Yield Research aims production of high yields by adopting improved varieties, closer crop geometries to sustain high population stand, heavy fertiliser levels, use of organic manures and growth regulators. The symposium provided a platform for exchange of ideas between workers engaged in Maximum Yield Research and to interact as a group with scientists having knowledge and experience in different facets of crop production.

The results of experiments conducted in India showed that it is possible to harvest yields up to 10 t/ha of paddy (unhusked) and 6.3 t/ha of wheat in Punjab province.

In Japan, the increases in yield of rice have been attributed to improved cultivars, water management, better seedling preparation and high use of fertilisers and chemicals. The work done in Bangladesh showed the beneficial effect of combined application of S, P and K in wheat-mungbean-rice cropping system. Similarly in China, increases in yields have been attributed to combination of factors of varieties, plant population, irrigation schedule, more fertilisers and organic manuring. In studies in Pakistan, wheat yield of 8 t/ha and sugarcane yield of 184 t/ha have been obtained on large blocks of land by increasing plant population and balanced fertiliser use. The experiences with Maximum Yield Research on maize in Thailand and Malaysia revealed the importance of soil fertility. The findings from work on soybean in Taiwan focused attention on contribution of varieties, fertilisers, insecticides and fungicides, and in the Philippines on interaction of fertilisers and irrigation in obtaining higher yields.

G. Dev, Gurgaon, India

ACTIVITIES OF THE COMMISSIONS AND WORKING GROUPS ACTIVITES DES COMMISSIONS ET GROUPES DE TRAVAIL TÄTIGKEIT DER KOMMISSIONEN UND ARBEITSGRUPPEN

Subcommission B – Soil Micromorphology

A meeting was held on 10 February 1989, in the Instituto de Edafología y Biología Vegetal de Madrid, to commemorate the 50th anniversary of the publication of *Micropedology*, the first treatise on Soil Micromorphology by Prof. W.L. Kubiena, Researcher Extraordinary (1949-1964) of the Instituto de Edafología y Biología del C.S.I.C. On exhibition were the original water colours, by G. Kallab and A. Prazak, that illustrated Kubiena's book *Claves Sistematicas de Suelos*, published by C.S.I.C. in 1953.

Prof. W.L. Kubiena (1897-1970), Ph.D. in Agricultural Engineering and Geology of the University of Vienna, worked in Soil Microbiology at Rutgers University, New Jersey (U.S.A.) with Prof. S.A. Waksman (Nobel Prizewinner, 1952). In 1941 he was elected to the Chair of Geology and Soil Science at Vienna Polytechnic.

Obsessed by the desire to create a technique by which soils could be studied without being modified, Prof. Kubiena began his studies on Soil Microstructure. His excellent knowledge of the world's soils (from the North Pole to the South Pole) led him to perfect a systematics. He proposed a Natural Classification System which appeared in 1953 in his work 'Claves Sistematicas de Suelos', published by the C.S.I.C. in Spanish, German and English. This publication earned him the Justus Von Liebig prize.

Prof. Kubiena was conferred an Honorary Doctorate by the Universidad Complutense of Madrid and he was also an Honorary Member of the C.S.I.C. of Spain. On the occasion of his 70th birthday, *Geoderma* published a special issue, in his honour, on Soil Micromorphology.

Prof. Kubiena first visited Spain in 1943 and he returned in 1949 to work at the Instituto de Edafología y Biología Vegetal of the C.S.I.C. Until his death, in 1970, he combined his teaching and research activities in Reinbeck (Hamburg) with his scientific work in Madrid.

The following spoke at the Meeting: Dr. Antonio Bello, Director of the Instituto de Edafología y Biología Vegetal; Ms. Marina Kress, from the Office for C.S.I.C.-E.E.C. Relations, who spoke on the personal profile of Prof. Kubiena; Dr. Eloy Dorado, Editor of *Anales de Edafología*, who presented the special issue in memory of Prof. Kubiena; Dr. Francisco Velasco, Head of the UEI of Soils, who spoke on Kubiena's Classification of Humus; Dr. Antonio Guerra, Professor of Pedology of the Universidad Autónoma de Madrid, who gave a talk on Kubiena's contribution to the Classification of Mediterranean Soils.

R. Jimenez, Madrid, Spain

Working Group on Pedometrics (WG/PM)

This provisional new working group was mentioned in the last issue of the bulletin. However, the name and address of the chairman should read: Dr. R. Webster, Rothamsted Experimental Station, Harpenden, Herts AL5 2QJ, United Kingdom.

Working Group Soils and Geomedicine (WG/SG)

The Working Group on Soils and Geomedicine was created in 1986 at the initiative of Prof. J. Låg, of the Norwegian Academy of Science and Letters. Geomedicine is the science dealing with the influence of ordinary environmental factors (versus occupational factors) on the geography of health problems in man and animals.

Geomedical problems in humans have been dealt with since the time of Hippocrates. Marco Polo observed an animal disease in western China which now appears to be

selenium poisoning. On the other hand selenium was also recently found to be a necessary element for man and animals. Some connections have been found between low intakes of selenium and some forms of cancer and cardio-vascular diseases. As a preventive measure in Finland small amounts of selenium are added to fertilizers applied to cereals and forage apparently resulting (in combination with other measures) in a marked decrease of cardio-vascular diseases. The importance of cobalt and fluorine has been recognized years ago. However, systematic health research from a soils point of view has been very dispersed.

The Working Group is attempting to create a greater awareness of the issue. Its first symposium was held in Oslo, in May 1988, devoted to 'Health problems in connection with radiation from radioactive matter in fertilizers, soils and rocks'. Its second symposium was held on 25-26 May 1989 in Tromsø, Norway, on the theme: 'Trace elements in relation to human and animal health in arctic and subarctic regions'. It was organized jointly with the Norwegian Academy of Science and Letters and hosted by the recently founded (1972) University of Tromsø, the most northern University in the world (1750 km north of Oslo, and 3° north of the arctic circle). The specificity of the arctic regions is related to the harsh climatic conditions (low temperatures seem to induce higher sensitivity to trace element deficiencies or excesses), the 3 months 'all dark' winters alternating with 3 months 'all light' summers, a 'natural' diet with an important component of fish and marine mammals, a weak stage of weathering of the soils and hence a strong reliance on the geochemistry of bedrock and surface waters. Some of the highlights dealt with at the meeting were the Nordic cancer atlas; harmful effects of air pollution on human and animal cold in the USSR; dietary intakes of trace elements in Scandinavian countries; the geochemical maps of the 'Nordkalotten'; cancer, cardiovascular disease and selenium status in Finland; selenium deficiency in north-eastern China. A short report was also presented on the FAO-European network (established in 1977) on trace elements in soils and plants. Although its work is mainly related to soil-plant relationships the results obtained on analytical methodologies should be useful to the ISSS Working Group.

The symposium was attended by 50 participants (30 from Norway and 20 from other countries including Belgium, Canada, China, Denmark, Finland, Poland, Sweden and the USSR). Two features of the symposium were particularly striking. Of the 50 participants only 4 were soil scientists, the others were medical doctors, nutritionists, geologists, geographers, pharmacologists and environmentalists. The relationships established were mainly based on geochemical studies rather than on soils work (the selenium deficient belt in China was reported to extend throughout the central part of the country, from the south-western subtropics to the north-eastern boreal region, covering a great variety of different soils).

The proceedings of the Symposium will be edited by Prof. J. Låg and published by the Norwegian University Press (P.O. Box 2977, Tøyen, N-0608 Oslo 6, Norway) which has also published the proceedings of previous symposia on the subject (Geomedical Research in relation to Geomedical Registration, 1984; Geomedical Consequences of the chemical composition of freshwaters, 1987; Commercial fertilizers and geomedical problems, 1987; Health problems in connection with radiation from radioactive matter in fertilizers and rocks, 1988).

The Working Group seeks to elate soils work in this field of research and would like to strengthen contacts between members of the ISSS who have experience with relationships between trace elements and health problems. Would they please write to the Secretary of the Working Group and signal work being done in this field. The next session of the Working Group is planned to be held in Oslo in May 1990. Exact dates and the theme of the meeting will be announced in this Bulletin.

Address: R. Dudal, Secretary WG/SG, 92 Kard. Mercierlaan, B-3030 Leuven, Belgium

**NEWS FROM THE NATIONAL AND REGIONAL SOCIETIES
NOUVELLES DES ASSOCIATIONS NATIONALES ET REGIONALES
BERICHTE DER NATIONALE UND REGIONALE GESELLSCHAFTEN**

Golden Jubilee of the Polish Society of Soil Science

The Polish Society of Soil Science held a Jubilee Scientific Conference on occasion of its 50th Anniversary, in Warsaw, September 8-10, 1988 in the premises of the High School in Ursynów.

On the 8th September, after the opening of the Jubilee Session by Prof. S. Moskal, President of the Polish Society of Soil Science, the municipal authorities and representatives of Ministry of Agriculture, Academy of Sciences as well as other scientific societies of Poland addressed the Polish Soil Science Society with 50 years of existence. Addresses were given also on behalf of ISSS by its Deputy Secretary-General and by the attending participants from other national soil science societies.

During the Plenary Session five papers were delivered, all devoted to the history and activity of Polish Soil Science Society. Prof. Dr. Tomasz Komornicki presented his introductory paper on the history of the Polish Soil Science Society (50 years after its foundation) commemorating the founding fathers of the Society: Prof. F.K. Terlikowski, Prof. A. Musierowicz, Prof. M. Górski and Prof. L. Królikowski who were presidents of the Society respectively.

Prof. Strzemiński delivered a very interesting paper dating back the beginning of the Polish soil science to four hundred fifty years. After his paper, the paper of late Prof. Dobrzański was presented on the history of soil science in Technical University at Lublany. Prof. Prosiński presented a paper on the history of Polish forest pedology in the sixty years 1926-1986. The last paper of the plenary session by Professors Gorlach, Mazur and Moskal was devoted to the agricultural chemistry in the fifty years of Polish Soil Science Society.

The plenary session was followed by commission sessions and poster exhibitions.

The Polish Society of Soil Science edited a Jubilee issue of its periodical *Roczniki Gleboznawcze* Tom. XXXIX, No.2, for its Golden Anniversary with Preface of Dr. Wim G. Sombroek, Secretary-General of the ISSS, containing the plenary papers of the Jubilee Session and activity of commissions and local organizations of the Society.

On the 9th and 10th of September 1988 two professional excursions were organized in the surroundings of Warsaw, demonstrating genesis and typology of soils as well as observations of different environmental patterns and national parks.

The meeting – with more than two hundred participants and representatives of ten countries and international organizations of Austria, Bulgaria, Czechoslovakia, France, German Democratic Republic, Hungary, Yugoslavia, USSR and International Soil Science Society – not only worthily commemorated the 50th Anniversary of the Society but it was also a pleasant gathering of soil scientists who enjoyed the beauty of the country as well as the traditional hospitality of the organizers.

I. Szabolcs, Budapest, Hungary

Sociedad Española de la Ciencia del Suelo

The 2nd National Conference on soil Science was held in *Seville, Spain, on 26-30 September 1988*. The topic of the Conference was 'research-use-conservation'. Organizing institutions were the Spanish Society of Soil Science and the Agrobiological Institute of Seville. The Conference Secretary was Dr. Mudarra. Among those present were researchers from Latin America and papers had been sent from Argentina, Bolivia, Brazil, Colombia, Cuba, Chile, Dominican Republic, Ecuador, Guatemala and Peru.

Following the opening session, Prof. Carpena-Artés gave a lecture on the 'Efficient Use of Soils and Artificial Substrates in Modern Agriculture'. Other lectures were given, in between the working sessions, on subjects such as: 'Soil Science and Agricultural Planning of Land. The Portuguese Example', by Prof. Carvalho-Cardoso, 'Soil Structures as seen in Polished Blocks and Thin Sections', by Prof. Fitzpatrick. Also worthy of mention was Prof. Bolt's talk on 'Transport and Accumulation of Ions in Soils. review of Recent Developments'. Finally, the Director General of Planning of the A.M.A. Andalusia spoke on 'Work of the A.M.A. in preparing an Ecological Inventory of Andalusia'.

A total of 122 papers were presented, of which 93 were given orally in different working sessions. The remaining papers were presented either in writing or graphically. Presentations were divided almost equally among the 8 working sessions.

Round tables were held on: 1) Mesofauna-soil interaction, 2) New technologies and soil studies, and 3) Ecological concept of maturity in exploited soils.

An excursion was arranged in order to visit various soil profiles, particularly the 'Parque Natural - Sierra de Grazalema'. After the Conference, there was a visit to the regions of 'El Aljarafe' and 'El Condado', where Palexeralf, Fragixeralf and Xerop-samment soils were studied. A further visit to the Coto de Doñana provided the opportunity to observe Calciaquolls and Medisaprists.

We were highly satisfied with the success of the Conference and hope this will be the second of a regular series.

R. Jimenez, Secretary SECS, Madrid, Spain

Address: c/o Instituto de Edafología y Biología Vegetal, Serrano 115 dpdo, 28006 Madrid, Spain.

Soil Science Society of America

The SSSA will assist in the support and development of a film on the history of soil science and its effect on the environment and world problems. 'The film will be a portrait of the soil as a crucial world resource' said the producer D. Williams in October, while consulting with ASA-CSSA-SSSA Executive Vice President Robert F. Barnes. 'There will be some reference to soil as a science and to the history of that science. Relating the history constitutes the backbone of the film, the thread'.

Williams said he contemplates four parts to the film. He will start with the USSR, the cradle of soil science. The second part will feature the opening of the U.S. Midwest to farming and the shift of preeminence in soil science from the Soviet Union to the USA. Part three will focus on the Third World since World War II, where increasing population pressure gave a new edge to soil problems. Finally, Williams will look at soil science today, the directions it's taking, the problems it's facing, and the solutions it's offering.

He will consult with SSSA scientists during his filming of parts two through four in the summer of 1989. He expects to complete the film in 1990.

Yugoslav Society of Soil Science

The Yugoslav Society of Soil Science celebrated its 35th anniversary at the 8th Congress of the Society which was held in the old capital of Crna Gora, Cetinje from 23 to 27 May 1988. It is a tradition of the Yugoslav Soil Society that the congresses are held every four years in different republics of Yugoslavia.

The 8th congress was preceded by two professional excursions: the first one on 23 May, in the area of Cetinje-Titograd-Cemovsko polje-Skadarsko jezero-Cetinje. On this route different karst formations and soil development on karst were demonstrated, as well as soils developed on different sediments. The participants also visited farms and factories of food products. The second excursion, on 24 May, led through: Cetinje-Niksic-Grahovo-Kotor-Cetinje. On this route different soils developed on limestones and dolomite were demonstrated and also well-developed profiles on sediments. A factory of juice and beer was also visited.

Both excursions were full of beautiful sites of Crna Gora, particularly the high mountains, the surroundings of Skadarsko lake as well as of bay of Kotor and littoral route along the Adriatic coast. The hard environmental conditions of karst region were demonstrated as well as the successful methods of agricultural production and its development in the republic.

On the 25th, the opening ceremony of the Congress was held in Cetinje, attended by approximately 300 persons. Besides the members of the Yugoslav Society of Soil Science and local authorities, nearly ten foreign countries were also represented by delegates. The Congress was opened by the President of the Yugoslav Society of Soil Science and subsequently addressed by the leaders of Crna Gora and Cetinje as well as by veterans of the Yugoslav Society of Soil Science and by the representatives of guests including the Deputy Secretary General of ISSS.

The introductory paper was delivered by the President of the Organizing Committee of the Congress Grujica Duretic, which was followed by five plenary lectures: Genetics and properties of soils developing on karst; Amelioration of karst lands; Agricultural methods of karst amelioration; The geological conditions of Karst in Crna Gora; Chemical erosion following deforestation in Vojvodina and its consequence analog to the karst formation. The plenary lectures were followed by extended discussion including also a night session.

On the next days the papers were delivered in four sections: 1. Genetics, classification, cartography, mineralogy, local distribution and conservation of soils; 2. Physics and technology of soils, irrigation and drainage, climatology and hydrology; 3. Chemistry and biology of soils; and 4: Soil fertility and production of crops. In each of the sections more than 30 papers were delivered and they were followed only with short discussion because of the limited time available. Posters were also exhibited on different subjects concurrently with the section meetings.

The 8th Congress of the Yugoslav Society of Soil Science, as well as its former congresses, demonstrated the problems and achievements of soil science and the related subjects in Yugoslavia with particular regard to the recent level of soil science from one side and of the practical requirements of agri-, silvi- and horticulture as well as environmental protection from the other side.

The full material of the congress was printed in a pre-congress volume in Serbo-Croatian language with summaries in English.

The activity and achievements of our Yugoslav colleagues and last but not least the conscientious organization of the Congress by Prof. Grujica Duretic and his colleagues who offered traditional hospitality to all visitors made deep impression on all the participants and the Congress will remain for them a long and pleasant memory.

I. Szabolcs, Budapest, Hungary



A S S S

All - African Soil Science Society

During the First African Soil Science Society Conference held in Kampala, Uganda, December 5-10, 1988, the constitution of the African Soil Science Society was ratified and the officials of the Society were elected as follows:

President:	Prof. Dr. A. Elgala (Egypt)
Vice Presidents:	Prof. J.K. Zake (Uganda) Prof. A.A. Agboola (Nigeria) Prof. Dr. M.A. El-Nahal (Egypt)
General-Secretary:	Prof. M.P. Salema (Tanzania)
Assist. General-Secretary:	Dr. B. Mutwewingabo (Rwanda)
Treasurer:	Dr. T. Tchemi (Togo)
Members of the Executive:	Dr. V. Chinene (Zambia), Mrs. M. Silver (Uganda), Prof. V. D'Costa (Kenya)
Members of the Council:	Dr. V. Ngarambe (Burundi), Dr. N.N. Nyandat (Kenya), Dr. A.T. Halm (Ghana), Mrs. M.J.N. Okwakol (Uganda), Dr. F.N. Muchena (Kenya)

The Council held its first meeting during the conference and decided that the next conference of the African Soil Science Society be held in Cairo, Egypt, some time in September 1991.

Bodenkundliche Gesellschaft der Deutschen Demokratischen Republik

17. Wissenschaftliche Tagung in Dresden, 3.-6. Oktober 1988.

Die Bodenkundliche Gesellschaft der DDR beging im Dezember 1987 den 20. Jahrestag ihrer Gründung. An der Jubiläumstagung 1988 in Dresden nahmen mehr als 200 Mitglieder und Gäste teil. In einer Grußansprache würdigte der Präsident der Akademie der Landwirtschaftswissenschaften der DDR, Prof. Dr. Drs. hc. D. Spaar, die Arbeit der Bodenkundlichen Gesellschaft der DDR und orientierte auf neue Ziele. Im Festvortrag des Vorsitzenden der Kommissionen und Subkommissionen wurden bisherige Ergebnisse gewertet und Aufgaben für die 90er Jahre abgeleitet. Im Mittelpunkt wird eine effektive ökologiegerechte Landnutzung stehen.

Am zweiten Beratungstag gab es Podiumsdiskussionen in 2 Sektionen: (1) Bodenphysik, Bodenklassifikation und Kartierung, Melioration; und (2) Bodenchemie, Düngung, Bodenbiologie, Bodenfruchtbarkeit.

Grundlage für die Diskussionen waren Vorab-Mikrofiche-Kopien von 60 Originalarbeiten sowie eine Posterausstellung und eine Software-Demonstration. Alle Beiträge, einschließlich Exkursionsführer, erscheinen 1989 als Tagungsbericht Nr. 269 der Akademie der Landwirtschaftswissenschaften der DDR. In begrenztem Umfang bestehen Möglichkeiten zum Kauf dieses Tagungsberichtes. Die Exkursion führte am 5. Oktober auf Standorte des mittelsächsischen Ackerlandes und am 6. Oktober in den Tharandter Wald bei Dresden.

An der Tagung nahmen die Präsident bzw. Vertreter der Bodenkundlichen Gesellschaft aus Bulgarien, Österreich, Polen, Ungarn, der Tschechoslowakei, der Sowjetunion und der Schweiz teil. Grußworte der IBG übermittelte der Stellvertretende Generalsekretär, Prof.Dr. I. Szabolcs. Prof.Dr. P. Kundler, Ehrenpräsident der Akademie der Landwirtschaftswissenschaften der DDR, und Prof.Dr. Reuter, Universität Rostock, wurden zu Ehrenmitgliedern der Bodenkundlichen Gesellschaft der DDR gewählt.

J. Quast, Müncheberg, DDR

Adresse: Krausenstraße 38/39, Postfach 1295, DDR-Berlin 1086, D.D.R.

Soil Science Society of Nigeria

The 16th Annual Conference of the Soil Science Society of Nigeria was held in Minna, Niger State from 27-30 November 1988. The theme of the conference was 'Soil Conservation, Soil Testing and Fertilizer for Continuous Food Production'. The Conference which was attended by about 300 participants – soil scientists, farmers and administrators from all parts of Nigeria and soil scientists from the Canadian Society of Soil Science – addressed the most pressing problem of our time : self-sufficiency in food production.

A total of 50 technical papers covering soil conservation and erosion problems, soil testing, soil fertility management and maintenance and large scale farming in relation to continuous food production were presented.

A field excursion was made to parts of Niger State to examine soil profiles and the management of soils under large scale farming.

On the occasion of this conference, elections were held to constitute the executive committee for the period 1989/1990. The following are the members of the new executive committee:

President:	Prof. A.G. Ojanuga
Past-President:	Prof. W.O. Enwezor
Vice-President:	Mr. E.O.U. Okoye
Secretary:	Dr. U. Omoti
Treasurer:	Dr. A. Oluobi
Editor-in-Chief:	Prof. O. Babalola
Assistant-Secretary:	Dr. V.O. Chude
Business Manager:	Dr. V.A. Banjoko
Financial Secretary:	Dr. P.O. Aina
Ex-Officio Members:	Dr. K.A. Ayotade, Prof. J.A. Adepetu.

The next annual conference of the Society will take place in October 1989 at the University of Nigeria, Nsukka.

Address of the Secretary: Chemistry Division, Nigerian Institute for Oil Palm Research (NIFOR), P.M.B. 1030, Benin City, Nigeria.

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

Dr. **J.W.B. Stewart**, from Saskatchewan, Canada, was appointed Secretary-General of SCOPE. He is a Vice-chairman of ISSS Commission III and is also joining the ISSS Committee on International Programmes.

Prof.Dr. **Kikuo Kumazawa**, Chairman of Organizing Committee of 14th ICSS, Kyoto, Japan, was awarded by the Japan Academy, affiliated with the Ministry of Education, Science & Culture, for academic achievement. Dr. Kumazawa is also member of the Board of IBSRAM.

Dr. **Kazutake Kyuma** became a member of the Japan Council, and at the same time a member of the IGBP committee within the Council.

The Royal Academy of Overseas Science of Belgium has nominated Dr. **Hari Eswaran**, Program Leader of the USDA Soil management Support Services as a member.

Dr. **Hubert G. Zandstra** was appointed deputy director general for research at IRRI effective January 1989.

Dr. **E.F. Tacke** was appointed director of ICIMOD, Kathmandu, Nepal. He is expected to take up his new functions in mid-1989.

Prof.Dr. **R. Dudal** was elected a Member of the Norwegian Academy of Science and Letters, Class of Mathematical and Natural Sciences.

Prof.Dr. **H. Scharpenseel**, chairman of the ISSS Committee on International Programmes, was appointed member of the Board of the Tropical Soil Biology and Fertility Programme of IUBS/Unesco-MAB.

Prof.Dr. **H.-J. Altemüller**, Braunschweig-Völkenrode, wurde auf der Internationalen Arbeitstagung für Mikromorphologie des Bodens in San Antonio, Texas, USA (10-15.7.1988) mit dem KUBIENA-AWARD ausgezeichnet. Die Medaille wird von der Symbionne B der Internationalen Bodenkundlichen Gesellschaft für besondere Leistungen auf dem Gebiet der Mikromorphologie des Bodens verliehen.

Prof.Dr.h.c. **E. von Bogulawski**, Gießen, wurde die Ehrendoktorwürde der Gesamt-Universität Izmir/Türkei verliehen.

Prof.Dr.h.c. **B. Ulrich**, Göttingen, wurde seitens des schwedischen Königs der Marcus-Wallenberg-Preis verliehen.

Dr.habil **P. Felix-Henningsen**, Bonn, hat einen Ruf der Universität Münster auf die C3-Professur für Physische Geographie mit Schwerpunkten Bodenkunde und Geomorphologie zum 1. Oktober 1988 angenommen.

Dr.hab. **H.-G. Frede**, Göttingen, hat den Ruf auf die C4-Professur für Landeskultur (Nachfolge Wohlrab) in Gießen zum 1.4.1988 angenommen.

Prof.Dr. **G. Miehlich**, Hamburg, wurde zum 1.7.1988 auf eine C4-Professur für Agrarökologie (Nachfolge Rohdenburg) an der Technischen Universität Braunschweig erhalten und angenommen.

Dr.habil. **A. Skowronek**, Würzburg, hat den Ruf auf eine C3-Professur am Institut für Bodenkunde der Universität Bonn zum 1. April 1988 angenommen.

Prof.Dr. **K. Stahr**, Berlin, hat einen Ruf auf die C4-Professur für Allgemeine Bodenkunde der Universität Hohenheim (Nachfolge Schlichting) erhalten und zum 1. August 1988 angenommen.

IN MEMORIAM

Dr. K.M. Schallinger (1915-1989)

Dr. Kurt M. Schallinger was born in Austria in 1915. He completed his studies at the Faculty of Chemistry of the Technical University of Vienna in 1938, the year of the 'Anschluss' when Austria voted to unite with Nazi Germany. Arrested by the notorious Adolph Eichmann himself, Schallinger succeeded in reaching Palestine as a refugee in 1939.

After World War II his career in soil science began when he joined the Department of Soils of the Agricultural Research Station, forerunner of today's Agricultural Research Organization at the Volcani Centre. Specializing in the chemistry of peat soils, Dr. Schallinger's work contributed much to the successful agricultural exploitation of the one-time Huleh swamp area in the Upper Jordan Valley; the results of this research appearing in more than twenty scientific publications that he authored. In 1971 Schallinger received his Ph.D. from the Hebrew University of Jerusalem for his thesis on *The Nature and Function of Polysaccharides in the Organic Matter of the Soils of Israel*.

From 1961 to 1963 Dr. Schallinger served as Chairman of the Israel Soil Science Society. In 1975, and again in 1983, he organized and chaired the International Symposium on Peat in Agriculture and Horticulture that were held in Israel. In 1978 he directed the International Symposium on Irrigation and Water Supply that also took place in Israel. From 1971 to 1984 he was a member of the executive council of the Israel Chemical Society.

In 1969, at the age of 55, Kurt Schallinger began a second career in agricultural science, one which was to make him internationally known and admired. Ironically, in view of his tragic death, the first four courses he organized were for agronomists from the West Bank and helped to initiate the dramatic advances in West Bank agriculture that were brought about since 1967, largely by graduates of these courses. This was soon followed by his major annual achievement – the International Postgraduate Course on Irrigation held at the Volcani Center and sponsored by the Israel Foreign Ministry's Division of International Cooperation.

Through these and other courses he organized, Dr. Schallinger sought to share Israel's experience and knowledge with other countries of the world, and thus help to improve agricultural practices in the participants' home countries. He was a rare example of a true internationalist, a friend to all without regard or prejudice to race, religion, gender or nationality; a friendship which was rooted in his own strong pride in Israel's land, people and religion. All who met him sensed these qualities. Coupled with his openness and boundless enthusiasm they made him one of Israel's most effective representatives, an ambassador who extended assistance and friendship to everyone willing to accept it.

J. Shalhevet, Bet-Dagan, Israel

Dr. Samuel Luther Tisdale (1918-1989)

Samuel Luther Tisdale, 70, former president of the Sulphur Institute, Washington D.C., died 16 January 1989 in Bethesda, MD, USA.

Dr. Tisdale, a native of Tampa, FL, earned a B.S. in agricultural science from Auburn University in 1942, and joined the armed forces shortly after graduation.

During World War II, Dr. Tisdale served as a parachute artillery officer in New Guinea and the Philippines. Following the war, he enrolled at Purdue University, where he earned his doctorate in soil fertility and plant nutrition in 1949.

He began his professional career as an assistant professor at North Carolina State University in 1949. After several years of teaching and research there, he took an

18 month leave of absence in 1951 to serve as an agronomist for the Tennessee Valley Authority's fertilizer evaluation program. He returned to North Carolina State as an associate professor in 1953 and was promoted two years later to professor of soils and director of the university's soil testing division.

In 1958, he became southeastern regional director of the National Plant Food Institute in Atlanta. In 1960, Dr. Tisdale joined the Sulphur Institute as director of agricultural research. He was promoted to the presidency of the institute in 1980 and retired in 1984.

Dr. Tisdale established an international reputation as a leading agronomist through his research, writing, speaking, and leadership in the world fertilizer industry. He was the author or co-author of over 35 papers and numerous popular articles. His best known publication is the well-received and highly regarded textbook *'Soil Fertility and Fertilizers'* written with Werner L. Nelson and James D. Beaton. Now in its fourth edition, the book has been translated into Spanish and Rumanian, and has been used in over 70 educational institutions worldwide. Dr. Tisdale also acted as one of the editors of the Soil Science Society of America's *'Changing Patterns in Fertilizer Use'*.

Throughout his career, Dr. Tisdale was honoured with membership and awards from a number of organizations, including the American Society of Agronomy, which bestowed upon him the *Agronomic Service Award for his exceptional contributions* as an agronomist and soil scientist. Respectfully known as 'Mr. Sulphur' and 'Dr. Sam', he served on boards and committees of various other organizations and was on the advisory board of the American Chemical Society's *Journal of Agricultural and Food Chemistry*.

His contributions to his profession throughout the world in over 45 years as an agronomist were great, as a researcher, administrator, and industry leader. He maintained a reputation as a conscientious, dedicated individual, well liked and highly respected by friends and professional associates, who will recall fondly Dr. Sam's kindness and gentle humour.

(from: Agronomy News)



Mostafa Elgabaly (1913-1988)

Mostafa Elgabaly was born 1913 in Nawasa Elgheit, Dakahleya Province, Egypt. In 1936, he graduated with honours from the faculty of agriculture, Cairo University, Fouad University at that time. Three years later, he was granted a Scholarship to pursue a Ph.D. in Economics. Realizing Egypt's need for specialized scientists in soils, he switched to Soil Science. In 1943, the University of California at Berkeley awarded him the 'Phi Beta Kappa' gold medal. In 1944, he returned to Egypt with a Ph.D. in Soil Science.

A man of strong personality and intense enthusiasm and imagination, he projected his ideas far ahead in many aspects of scientific life, and activities in his country.

In education his prime achievement was the setting up of the first soil science Dept. in Egypt at Alexandria University in 1944. Now there are more than 11 departments of soil science in the different universities and centres of agricultural research.

In the 1950's he likewise became one of the prominent founders of the salinity laboratory in Alexandria. In 1960, he established the first 'Institute of Land Reclamation'

in the middle East with the assistance of a Ford Foundation grant.

As a head of Soil Dept. Alexandria University from 1944-1965, he published an unusually large number of invaluable research works covering a wide range of subjects in specialized journals all over the world. Part of this research was fulfilled during his stay at Uppsala University, and at Berkeley as a visiting scholar and professor.

In 1966, he came to head the newly established organization for land utilization and development with the express purpose of planning and implementing the utilization and development of 900,000 acres that were added to Egypt's agricultural lands following the construction of the High Dam. This gave him the unique opportunity to develop a comprehensive overview of Egyptian agriculture, indeed a turning point in his career marking the beginning of a new agricultural system based on land consolidation and agro-industrial complexes. This was to constitute the cornerstone for a genuine take-off in the agricultural sector.

From 1969 to 1972 Prof. Elgabaly directed his efforts to help build up the new 'Pouschkarov Institute' in Bulgaria through a FAO project. Today it ranks among the top Institutes in Europe. In 1972, he was appointed Minister of Agriculture, Land Reclamation and Agrarian Reform. During his tenure at the Ministry, he was able to design an overall agriculture policy for Egypt which reflected his deep understanding of the predicaments of Egypt's agricultural sector. He virtually left an indelible imprint of his effort on this sector as a whole.

It must be pointed out that Prof. Elgabaly remained all his life a genuine scientist and an avid scholar, always giving off his time and energy to worthy scientific causes which culminated in the setting up of both a soil master plan and a water master plan.

In 1975 he was selected to be a member of the Board of Trustees of the 'International Rice Research Institute' for nine years. From IRRI he brought the rice variety IR28 (high yielding, short duration variety). When in the late seventies he was appointed as a member of the Egyptian Academy of Science and head of the Academy Council for Agriculture and Food Research for nine years, he initiated the national scientific campaign for increasing the yield of the main crops in Egypt. By using a package of scientific recommendations, he was able with a group of scientists from different centres of agricultural research to introduce the new rice variety and succeed in its adaptation with his outstanding scientific perseverance. Now, as a result of this, Egypt has become a surplus producer in spite of its increasing population. This also goes for other main crops like cotton and wheat.

For his achievements he was awarded the 'State Distinction Prize for Science' in 1980, and the University of Alexandria Gold Medal in 1977.

With a keen eye on grassroot issues concerning the agricultural sector dating back to his early years, Prof. Elgabaly was always eager to propagate his scientific ideas in as simple terms as possible to the largest number of people. He thus wrote over 250 articles in newspapers, and weeklies over the period stretching from 1944-1988 which addressed both the specialist and the layman. His interests ranged from soil studies to fertilizer production and utilization, cropping systems, new communities, cooperatives, mechanized agriculture, agro-industrial projects, new land development and the like, all aimed at closing the food gap and socio-economic gap between the city and the village communities.

His interests were not restricted to Egypt alone but covered the larger Arab world where he advocated the urgent need to fill the food gap in the region as a whole. He fulfilled many worthy studies particularly while acting as Director of Land and Water Resources in the Middle East countries.



Prof. Dr. Shingo Mitsui (1910-1988)

Dr. Shingo Mitsui, Professor Emeritus, the University of Tokyo, and Honorary Member of the Japanese Society of Soil Science and Plant Nutrition, passed away on September 4, 1988 in Tokyo.

Dr. Mitsui was born in Kanda, Tokyo on January 1st, 1910. He graduated in March 1932 from the Department of Agricultural Chemistry, Faculty of Agriculture, the University of Tokyo. In that year he became a researcher at the National Agricultural Experiment Station in Nishigahara, Tokyo. In November 1948 he was appointed as Associate Professor, Faculty of Agriculture, the University of Tokyo. In May 1952 he was promoted to Professor. In 1963 he was appointed Councillor to the University of Tokyo, later he took chairmanship of the Chemistry Research Committee of Tokyo University Post Gradu-

ate Course. On retirement from the University of Tokyo in 1970, he was awarded a title of *Professor Emeritus*.

Throughout his long career as scientist, Dr. Mitsui made conspicuous domestic and international contribution in research and education on plant nutrition and fertilizer science, in promotion on newer agricultural technology as well as peaceful use of atomic energy.

In 1934, when disastrous rice plant damage was experienced by a prevailing lower temperature in northern Japan, the Government started the research on how to protect rice plant from severe cold stress. His research, carried out under this project, on carbon assimilation in a room of artificial environment first built in Japan is even today looked upon as a distinguished achievement, which established a basis of physiological research in agricultural science on photosynthesis.

During World War II, he made strenuous efforts to contribute to ensuring stable food supply through various research programmes initiated by himself, such as fertility increase by burning upland soil, high efficiency application of chemical nitrogen fertilizer to rice plant, improvement of Akiochi paddy field etc. In 1949 he received agricultural doctor's degree for his research on Increase of Fertility by Burning Soil. He played an active role as a pioneer in introducing radioactive and stable isotopes to Japan as a means of scientific research. In 1956, he was given a prize of the Japanese Society of Agronomy for his research on the Kinetic Study on the Nutrient Uptake by Crop Plants, which he extensively carried out at the University of Tokyo. In 1967, he was awarded with a prize from the Japan Academy of Science for his research on the Physiological-Chemical Studies on the Nutrient Uptake by Crop Plants.

There are many publications written by Dr. Mitsui including Research on Plant Nutrition and Fertilizer as highlights of his great achievement: Inorganic Nutrition, Fertilization and Soil Amelioration of Lowland Rice; Deficiency of Plant Trace Elements – Its Diagnosis and Steps to Cure; Denitrification in Paddy Field – Its Symptoms, First Notice and Outcome, and many other articles written by himself or compiled by him.

As a councillor, Dr. Mitsui supported the Japanese Society of Soil Science and Plant Nutrition for 37 years (1950-1987). He was Vice President of the Society under Dr. Matsusaburo Shioiri in 1950-51 and President in 1960-61. For his long-term great contribution he was installed as Honourable Member of the Society in April 1980.

In addition to the above, Dr. Mitsui was a Member of the Japan Academy of Science, Head of Laboratory of Herbicides and Plant Growth Regulators in the Insti-

tute of Physical and Chemical Sciences, a Member of Central Pollution Control Committee, Councillor and Honorary Member of the Japanese Society of Agricultural Chemistry, President of Fertilizer Research Institute and Member of the Board of Directors of the Japan Isotope Association and other institutions.

In April 1982 he was honoured with the Second Order of Merit and the Order of the Sacred for his great achievements.

The life of an outstanding scientist has come to an end. However, his great contribution will be remembered by many people who respect him and who know him.

Kikuo Kumazawa, Tokyo, Japan

Dr. Peter J. Rennie (1919-1989)

Peter J. Rennie, one of the world's three leading experts on the impact of acid rain on forests, died 26 Jan. 1989 at age 70. Dr. Rennie received his Ph.D. from Oxford University. He became scientific coordinator with Forestry Canada headquarters in Ottawa, but he was frequently called on to consult with agencies and organizations outside Canada. In 1988, the Air Pollution Control Association in the U.S.A. asked him to review U.S. acid rain control efforts and the U.S. government asked his critique of its National Acid Precipitation Assessment Program. He had a network of scientists around the world with whom he exchanged information.

He played a critical role in the creation of Canada's Long Range Transport of Air Pollutants Program, and was also interested in such diverse areas as the proposed MacKenzie Valley oil pipeline, soil contamination and erosion, sustainable development, and the effect of ozone on forests.

In December, he was made a fellow of the Canadian Society of Soil Science. He received the Queen's Silver Jubilee Medal for 'outstanding diligence in the performance of research duties' in 1977.

(from: Agronomy News)

**INTERNATIONAL RELATIONS
RELATIONS INTERNATIONALES
INTERNATIONALE VERBINDUNGEN**

ISSS Committee on International Programmes

MEETINGS ON GLOBAL CHANGE

A meeting of the Scientific Advisory Council for preparation of the International Geosphere Biosphere Programme (IGBP) was held in Stockholm, 24-28 October 1988. A report of this meeting was given in bulletin 74 (1988/2) page 30, indicating the need for identification of research priorities and contributions by ISSS members.

The role of the annual release of 7 bil t of C as CO₂ from fossil fuels (5.5 bil t) and from slash and burn (ca 1.5 bil t) in the global warming is fairly obvious. Less is known on the geochemical CO₂-release by weathering processes and degassing from subduction zones, volcanoes etc. The production of other trace gases such as CH₄ and N₂O is mostly agriculture or soil-related. Good quantitative estimates of their emissions are scarce.

The table below shows key figures, such as present concentrations, residence times, annual concentrations increases, radiative absorption potential, and estimated present compartmental contribution to global warming for the major greenhouse gases (origin: Enquête Commission Report 5/88, Zur Sache, Bonn University Printing, ISBN 3-924521-27-1).

Greenhouse-Gas	CO ₂	CH ₄	N ₂ O	Ozone (O ₃)	CFC-11	CFC-12
Concentration in ppm	346	1.65	0.31	0.02	0.0002	0.00032
Residence Time years	~ 100	~ 10	150	0.1	65	110
Concentration increase (% per year)	0.4	1.0	0.2-0.3	0.5	5	5
Radiative absorption potential relative to 1 molec. CO ₂	1	32	150	2000	14000	17000
Present % contribution by anthropogenic trace gases	50	19	4	8	5	10

A symposium (V-8) is planned during the 14th ISSS Congress, 12-18 August 1990 in Kyoto, on 'Global Soil Changes and their Dynamics in a Changing Environment'. It will deal with the influence of changing climate on soils. The preceding Wageningen Conference (14-18 August 1989) on 'Soils and the Greenhouse Effect' will concentrate on quantification of present fluxes of the major greenhouse gases, of evapotranspiration, and on quantification of the influence of global land use changes on trace gas fluxes, evapotranspiration and the surface energy balance.

This research area is exposed to ideological controversies and panicking overreactions. Considering the existing need for rational fact finding in this research area, IIASA (International Institute for Applied System Analysis, Austria) has organized a 'Task Force Meeting' on 'Concept of Global Soil Change' with 15 soil scientists from 7 countries in Budapest (24-27 April 1989, see separate report). The main purpose was defining the interactions between climate and soil changes and producing a document of ca 120 pages as a background information for scientists and the interested public.

The 'Global Soil Change' subject had only marginal representation in the traditional ISSS programme areas. Therefore, it was decided to organize a workshop on 'Expected Effects of Climate Changes on Soil Processes' prior to Kyoto. It will be held on February 12-14, 1990 in Nairobi, Kenya, to be directly succeeded by a three days meeting/workshop on 'Desertification Processes'. The provisional programme consists of a component technological approach to gain as much state-of-the-art coverage as possible. It will serve also as a preparation for the Kyoto discussion with the plenum.

The Nairobi meeting is expected to receive limited sponsoring by UNEP (Nairobi) and EEC-CTA (Wageningen). Participation will be by personal invitation. A limited self-payer participation by interested members appears possible.

H.W. Scharpenseel, Chairman, CIP

CONCEPT OF GLOBAL SOIL CHANGE

By an agreement between IIASA and the Hungarian Committee for Applied Systems Analysis, a Task Force Meeting on the Concept of Global Soil Change took place from 24 to 27 April 1989 at the premises of the State Office for Technical Development, Budapest, Hungary.

The meeting was initiated and arranged by IIASA following extensive preliminary scientific discussions between the representatives of IIASA, ISSS and IGBP concerning the place and role of soil studies within the forthcoming international programs on geosphere-biosphere interactions and global changes, and particularly within the framework of the current Biosphere Dynamics Project of IIASA.

The meeting was opened by Dr. Allen M. Solomon, Leader of the Biosphere Dynamics Project, IIASA, who outlined the main features and the scope of the project, as well as its possible contribution to IGBP. He also emphasized the importance of the present meeting for current and future activities of IIASA.

The words of welcome were given to the participants by Academician Arpad Csurgay, member of the IIASA Council, and Dr. Tibor Asboth, member of the Hungarian Committee for Applied Systems Analysis.

Dr. Victor Targulian, IIASA, made an introduction of the background document, which was prepared in advance for the meeting and distributed to the participants, about his views on the concept of global soil change. The document outlined the concepts and the philosophy of global soil change, as well as two specific proposals to be considered:

- Preparation, by the end of 1989, of a publication of about 100-120 typewritten pages on the concepts of global soil change as a major contribution to IGBP in the area of soils; and
- Preparation, as a long-term project, of an Atlas of Soil Changes, covering various aspects of global soil change. Further discussion of the atlas will take place at the next meeting of the task force.

After extensive and lively discussion of the issue at several sessions, the participants of the meeting decided that:

1. It is feasible to prepare, by the end of 1989, a publication on global soil change, not to exceed some 120 typewritten pages of text and supplemented by appropriate illustrations. It is suggested to be a joint IIASA/UNEP/ISSS publication.
2. The publication will be addressed to the world community of scientists involved in IGBP, e.g., ecologists, climatologists, hydrologists, geologists, biologists, etc., as well as decision and policy makers of high level. The publication will be scientifically sound and based on facts, but it is intended to be easily read and clearly understood by both specialists and laymen.
3. The publication will primarily be concerned with IGBP, and it will suggest a program of soil studies to be conducted by the world scientific community within the

IGBP goals and time frameworks. This program, based on an analysis of the existing knowledge of the past, present and future of soil of the world, will be the major recommendation of the task force.

4. The publication will contain the following chapters: Executive Summary; Introduction; Pedosphere; World Soil Cover; Concepts of Soil Changes; Paleo-Changes of the Pedosphere; Anthropogenic Soil Changes; Future Soil Changes; Data Bases and Models; Implications of Global Soil Change; and Recommendations on the Research Priorities.

The publication is planned for July 1990, and is viewed as a step in a series of ISSS activities concerned with the global soil change that also include:

- ISSS/ISRIC Conference at Wageningen, Holland, in August 1989 on 'Soils and the Greenhouse Effect';
- ISSS/UNEP meeting at Nairobi, Kenya, February 1990, on the dynamics of global soil changes;
- ISSS Symposium at Kyoto in August 1990 during the 14th ISSS Congress on global soil change.

Follow-up of the above joint ISSS, IIASA and UNEP activities will be discussed at the Kyoto Congress within the scope and the general framework of IGBP.

The participants expressed their wish to encourage all other working groups of ISSS to take this opportunity to participate actively in IGBP.

R. Arnold, Washington, USA
and B. Rozanov, Moscow, USSR

IGBP WORKSHOP ON GEOSCIENCES AND PAST GLOBAL CHANGES

This workshop on Past Global Changes, sponsored by the International Union of Geological Sciences, was held at *Interlaken, Switzerland, from 24-28 April, 1989.*

Derived from the conviction that earth scientists have an important role to play in ICSU's International Geosphere-Biosphere Programme: A study of Global Change, the workshop was called to discuss the relevance of the geological record to predict the global changes which may be taking place in the next decades or centuries. The workshop was requested to prepare a report analyzing the present state of knowledge on a global scale and to identify major gaps where interdisciplinary research on global change of the past and the present may help to attack the problem and to contribute research data to the decision makers. Discussions were held in four working groups: the marine sediment record; the terrestrial Quaternary record; resources and anthropogenically induced global changes; and biotic systems and genetic diversity, with the objective to recommend and outline future research directions and projects. It is planned that an administration similar to the Unesco/IGCP Program, as sponsored by IUGS, will be set up to support and coordinate the projects, so that global participation and especially from Third World countries will be assured.

From the soil science point of view, the final recommendation included significant programmes on the depletion of global soil resources, on soil erosion rates of the past and present, on anthropogenic perturbations of global geochemical cycles, on global changes in carbon reservoirs in soils and biomass based on paleopedological and vegetation maps of certain periods of the past. Two soil scientists, A.L. Page, Riverside, and D.H. Yaalon, Jerusalem, were active among the about fifty invited earth scientists present.

The Workshop on Global Change of the Past was supported financially by the Swiss Academy of Natural Sciences, IUGS and Unesco, and ably chaired by Prof. Ken Hsü, Institute of Geology, ETH, Zurich, together with the four Working Group chairmen (N. Shackleton, N. Rutter, I. Thornton, D. McLaren). The final report will be published shortly and distributed internationally.

D.H. Yaalon, Jerusalem

THE RELEVANCE OF SOILS AND PALEOSOLS IN INTERPRETING PAST AND ONGOING CLIMATIC CHANGES.

Paleosols, defined as soils which were formed in a landscape of the past, represent an excellent record of past environmental conditions, usually integrated over a certain period of time. Soils generally respond to climatic change somewhat slower than vegetation but are probably a more true record of the regional climate than pollen, which seem to show considerable variation over a short time range.

Paleosols have been identified in various environments from polar to deserts and in lithological sequences e.g. coastal sands, tills etc. but the long sequences in loess are probably the best for climatic interpretation and long distance correlation both on the continents and with the marine records.

Recent studies on soil dynamics, have or are gradually assembling quantitative data on the state of soil formation and their rates of change when subjected to new environmental conditions, but much remains to be done in this respect. It must be stressed that certain attributes like organic matter content respond rather rapidly (less than hundred years) to change and may reach a steady state within a short time, while other attributes, like clay formation and clay movement are relatively slow rate processes (on the order of thousands of years) and reach steady state rather slowly. In non-leaching environment, CaCO_3 accumulation in nodules and crusts is one of the best indicators of pedogenic processes usually well preserved in paleosols.

Plan of action

It is suggested that within the IGBP program on Global Change of the Past stress concerning soils be put especially on the following three aspects:

1. The preparation of *Paleopedomaps* for certain slices of time representing both colder and warmer periods of the past, e.g. 18 kyBP, 6 (or 9) kyBP and 125 kyBP. Most of these maps can be prepared in a 1:15 mill. scale based on already available data and intelligent interpolations, and using e.g. the FAO/Unesco soil classification system. The main purpose of these paleopedomaps would be to produce from them derived maps of carbon storage in organic matter and pedogenic carbonates in units of kp/m^2 , which would then be useful in obtaining the global C cycle for the time slice in question. Data for current C storage in soils and subsoil are available and would serve as a base for this. The INQUA/ISSS Paleopedology Commission has put out similar proposals and initial cooperation of interested persons has been ascertained but many more collaborators are needed.
2. A program for the wider study of soil chronosequence is needed in order to obtain data in the *Dynamics and Rate of Soil Changes*. Soil chronosequences are the best tool to obtain data on the rate of change of soil attributes, from CaCO_3 to organic matter accumulation, clay formation and movement etc. Their study should be promoted wherever well dated pedomorphic surfaces can be identified. A register of soil chronosequences might be established to enable a better interpretation. The Global Change Group of ISSS should take a lead in sponsoring this kind of programs under the auspices and in cooperation with IGBP and IUGS/INQUA.
3. A natural extension of both the above programs and a most desirable additional one would be the *Modelling of Soil Formation Processes* and modelling of the impact of specific environmental changes (AoT, A, precipitation, vegetation change) on soils or specific soil properties, e.g. carbon storage, acidifying, etc. A corollary of these deliberations would be the preparation of a map of the soil degeneration potential (how slow or rapidly soils of various regions are susceptible to change). Initial preparation for such maps are being discussed with UNEP and FAO.

D. Yaalon, Jerusalem, Israel

Man and the Biosphere (MAB)

INTERNATIONAL WORKSHOP ON LONG-TERM ECOLOGICAL RESEARCH

In 1987 at the first all-European meeting of MAB National Committees, one of the topics which raised particular interest for future cooperation was long-term ecological research. Indeed, since 1986, seventeen Long-Term Ecological Research (LTER) sites have been established in the United States (eight of which are in biosphere reserves) and parallel, but separate efforts have been undertaken for example in the Netherlands, the Nordic countries and the Federal Republic of Germany.

It was within such a context that the FRG-MAB National Committee, with support and inputs from the US National Science Foundation, organized a workshop in *Berchtesgaden, Federal Republic of Germany, from September 18-22, 1988*, for 25 specialists from around the world who have been active in long-term research. The purpose of the meeting was three fold: (1) to review the current work on long-term ecological research and identify the key elements which lead to success; (2) to identify a set of themes or questions which could be addressed in future long-term ecological research efforts worldwide; and (3) to make recommendations as to how future LTER activities could be coordinated at the regional and international levels.

The presentations confirmed the interest in such long-term studies, particularly to provide a sound scientific basis for monitoring, for better understanding, and through increasingly sophisticated modelling, for predicting global change. Many of the scientists who participated at the workshop indicated that their work had often been grafted on to that of their predecessors to ensure continuity. They also indicated that there had always been difficulties in obtaining funding for such research which could not show significant results in the short term related to institutional funding cycles. Here, the advantages of having secure long-term research sites in biosphere reserves was mentioned. Much discussion arose on the topics for future long-term research, with emphasis on the importance of monitoring the composition and frequency distribution of soil microfauna. The transition from individual efforts to a regionally or internationally coordinated programme will take considerable time as the objectives of main research topics become clearer, and it is very likely that MAB and the IGBP (through geosphere-biosphere observatories) will be involved. The proceedings of the Berchtesgaden-LTER workshop are under preparation for publication by MAB-FRG.

MAB YOUNG SCIENTISTS RESEARCH GRANTS

At the 10th International Coordinating Council (ICC) meeting of MAB held at Unesco in Paris in 1988, the MAB Young Scientists Research Grant program was launched. It is designed to facilitate research work of young scientists from the same country. The application form notes, 'Individual research grants will be made available up to an amount of US\$ 5,000. Smaller requests have greater chances of approval.' MAB research fellows will be selected by the Unesco MAB Bureau (Executive Committee) of the ICC based on information provided in application forms.

U.S. NATIONAL COMMITTEE FOR MAB RESTRUCTURED

At a January 1989 meeting, the U.S. National Committee moved to restructure MAB (Man and the Biosphere project of Unesco) along lines designed to encourage a more effective focus on today's pressing environmental policy issued in a global trans-disciplinary context.

The MAB Program was consolidated into five new ecosystem-based Directorates to provide increased opportunities for cross-disciplinary collaboration among scientists while maintaining much of MAB's traditional 'biome approach'. The new MAB Directorates are: Temperate Ecosystems; Tropical Ecosystems; High Latitude Ecosystems; Marine and Coastal Ecosystems; and Human Settlements.

In order to invigorate and further stimulate greater inter-Directorate programs and activities, the Committee identified and established seven priority program areas to be addressed by the new Directorates. The priorities are: Aquatic Areas and Wetlands; Arid Lands/Desertification; Biological Diversity; Biosphere Reserves; Cultural Diversity; Global Change; and Sustainable Use/Development.

The Committee appointed scientists to draft mission statements for the new Directorates that reflect this increased focus and at the same time take into account the priority program areas. These mission statements will be reviewed at Executive Committee meetings and then presented to the National Committee for discussion, modification and adoption at the July meeting. Upon approval, the mission statements will be published in the Federal Register.

The U.S. National Committee also adopted a policy designed to ensure that the appointment of scientists to the new Directorates reflects an appropriate balance between social and biological/physical scientists as well as between federal and private sector scientists and individuals.

Dr. Lovejoy, Chairman of the National Committee, stated that the Directorates' mission statements, which will also incorporate and integrate the priority program areas, will form the core of the U.S. MAB National Program. Members of the newly formed Directorates will work cooperatively to implement the approved missions. He stressed that the National Committee will continue to reach out to the general scientific community through competitive peer-reviewed grants to attain and complement the continuing goals of U.S. MAB.

U.S. SUPPORT FOR GLOBAL CHANGE PROGRAM THROUGH UNESCO/MAB

The U.S. Department of State, through an exchange of letters between Assistant Secretary Richard S. Williamson of the Bureau for International Organization Affairs and the Director General of Unesco, Dr. Federico Mayor, made a voluntary contribution of \$125,000 to help support the development of Unesco's biosphere reserves into global geosphere-biosphere observatories (GBOs).

Under the agreement, MAB's biosphere reserves and other appropriate sites will be developed as part of a network of GBOs of the International Geosphere-Biosphere Program (IGBP) of the International Council of Scientific Unions (ICSU).

Dr. Mayor directed that Unesco contribute an equal amount of money for this purpose. He established a Unesco/ICSU steering group to foster cooperation between the intergovernmental and private scientific organizations. The steering group will determine and monitor the specific allocations of these funds, and report to the U.S. and Unesco by January, 1990.

The first meeting of the steering committee took place in February. Unesco was represented by the Directors of the science sector's divisions of Ecological Sciences, Earth Science, Marine Sciences, Water Sciences and the Secretary of the Inter-governmental Oceanographic Commission. A joint memorandum concerning co-operative activities on global change was approved which set out two fundamental objectives. They are, 'To enrich the International Geosphere-Biosphere Program with the contribution of Unesco's major environmental science programmes'; and 'To bring to bear the particular strengths of ... Unesco to the overall international scientific research effort in the field of global change'. The agreement noted that activities funded under this agreement '...in no way exclude contributions on the part of Unesco to the IGBP through other ongoing or potential activities with Unesco's environmental science programs. This additional dimension of interaction between ICSU-IGBP and Unesco is indeed sought and encouraged'.

from: U.S. MAB Bulletin, March 1989

(address: Dept. of State, OES/ENR/MAB, Washington DC 20520, USA)



Courtesy: Mrs. Chalinee Niamskul

WORLD CONSERVATION INFORMATION CENTRE (flora and fauna)

An information tool to help decision-makers plan environmentally sound development has been created by three leading international conservation organisations (UNEP, the International Union for the Conservation of Nature -IUCN, and the Worldwide Fund for Nature). They signed a Memorandum of Understanding, establishing the world's main centre for collection, analysis and dissemination of conservation data, to be located in Cambridge, United Kingdom. The World Conservation Monitoring Centre (WCMC) will become the focal point for documentation and distribution of information on the occurrence and state of species, the distribution and status of habitats including sites with special biological diversity, protected areas and the commercial exchange and trade in species and their products. WCMC will aim for a global overview of conservation data while at the same time making data available for those carrying out conservation and natural resource assessments at regional and national levels. Another departure will be the development of a network of national databases as a means of supporting conservation action at the local level in developing countries.

UNEP's Executive Director, Dr. Mostafa Tolba, who signed the Memorandum on UNEP's behalf, said the Centre's main aim will be to enable its founders and other users to give governments, international organisations and aid agencies environmentally sound advice for use in their development planning. 'I am confident that WCMC will be a major instrument in planning for sustainable development worldwide', he said.

The Centre will also house data on plants and animals of medicinal and economic importance, plant and animal genetic resources in botanic gardens and zoos, and on

the translocation, introduction or reintroduction of species.

All information will be geographically referenced. The data-base will be supported with bibliographic references and a selective register of relevant conservation programmes and other holders of relevant information.

The new database will also link into other existing international conservation information systems including those held by its three founders, plus the World Bank, Unesco, FAO, the Nature Conservancy, Conservation International, the International Council for Bird Preservation, the World Resources Institute and ICSU.

Dr. Michael Gwynne, director of UNEP's Global Environment Monitoring System, one of the environment and conservation information systems into which the new database will link, emphasised WCMC's importance as a repository for the world's best, most up-to-date conservation data. 'The new Centre could be the most important development since the founding of the World Wildlife Fund', he said.

International Council of Scientific Unions (ICSU)

REORGANISATION OF COSTED

COSTED, the Committee on Science and Technology in Developing Countries was established as a special Scientific Committee of ICSU in 1966. In 1973 it was given its organisation and structure whereby COSTED consisted of a President and nine members including a professional Scientific Secretary. The COSTED secretariat has been located in India from the beginning. In 1981 regional offices were established in Kenya, Nigeria and Trinidad. Quite recently, in 1988, ICSU decided to reorganise COSTED with regional offices in Asia, East and West Africa, Latin America and the Caribbean. Furthermore, in future the central administration will be undertaken by the ICSU secretariat in Paris. As a consequence of all this the Madras Office of COSTED has now responsibility for the Asia Region only and the financial support from ICSU is also likely to be reduced.

Simultaneously with the 1988 reorganisation of COSTED, Prof. S. Radhakrishna, the Scientific Secretary so far relinquished his office. Prof. R.R. Daniel took charge as Secretary of the Asia Regional Office at Madras from December, 1988.

During the term of office of Prof. Radhakrishna the activities of COSTED from Madras rapidly diversified and increased and the total annual budget grew to about Rs.100 lakhs. Therefore the two changes that have occurred simultaneously for the Madras office have resulted in the necessity of reviewing the overall activities, plans and funding for 1989 and reduce, reorient and reorganise all programmes for the future.

COSTED and its activities have thrived on the co-operation of innumerable people and organisations. As in the past the Madras Office will continue its best efforts to carry on the Science and technology programmes of concern and relevance to the developing countries particularly in the Asian Region. In order to achieve this your understanding and co-operation are solicited for the future. Suggestions and comments if any are welcome from our friends and partners in this endeavour.

R.R. Daniel, Madras, India

Note ISSS Bureau: The reorganisation of COSTED may imply that there is not anymore an regular annual contribution from that Committee to the ISSS young scientists travel fund ('Fellows Fund').

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

Meetings etc. marked with *, are organized or (co)-sponsored by ISSS, implying that participation with support from the ISSS Fellows Fund can be considered (for details on the Fund see page 42 of Bulletin 72).

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.

Les réunions, etc., marquées d'un astérisque () sont organisées ou (co)-financées par l'AISS, ce qui implique qu'il y a possibilité d'y participer avec un financement du Fond pour Aspirants de l'AISS (voir détails page 42 du Bulletin 72).*

Tagungen usw. versehen mit (*) werden organisiert bzw (mit)finanziert von der IBG, was bedeutet dass die Möglichkeit gegeben ist sich zu beteiligen mit finanzielle Unterstützung aus der IBG Stipendien (für Einzelheiten siehe Seite 42, Mitteilungsblatt no. 72).

Las reuniones, etc. marcadas con un asterisco () son organizadas o (co)-promovidas por la SICS, implicando la posibilidad de participar con el apoyo del Fondo para becarios de la SICS (ver detalles, p.42 del Boletín No.72).*

1989

11th International Plant Nutrition Colloquium (ICPN), Wageningen, the Netherlands, July 30-August 4, 1989.

Information: Dr. M.L. van Buisichem, Dept. of Soil Science and Plant Nutrition, WAU, P.O. Box 8005, 6700 EC Wageningen, the Netherlands.

***International Conference on Soils and the Greenhouse Effect**, the effect of changing soils and land uses on their emission of 'greenhouse' gases, evaporation and albedo; Wageningen, the Netherlands, August 14-18, 1989 (VROM/ISRIC, with co-sponsoring by ISSS Committee on International Programmes).

Information: Ir. A.F. Bouwman, Conference Secretary, ISRIC, P.O.Box 353, 6700 AJ Wageningen, the Netherlands.

International Symposium on Soil Testing and Plant Analysis, Fresno, California, USA, August 14-19, 1989.

Information: Dr. J. Benton Jones, Council on Soil Testing and Plant Analysis, University Station, P.O.Box 2007, Athens, Georgia 30612-2007, USA.

***International Meeting on Statistics, Earth and Space Sciences**, Leuven, Belgium, August 21-25, 1989.

Information: Dept. of Mathematics, Faculty of Sciences, Catholic University of Leuven, Celestijnenlaan 200B, 3030 Leuven, Belgium.

International Congress on Hydraulics and the Environment, Ottawa, Canada, August 21-25, 1989.

Information: K. Charbonneau, Conference Services Office, National Research Council of Canada, Ottawa, Ontario, Canada K1A 0R6.

***Pre-Clay-Conference study tour in Black Forest and Rhine Valley**, and one-day **Symposium on Rock Weathering and Soil Mineralogy**, organised by ISSS Commission VIII, August 27-29, 1989.

Information: Prof. Dr. A.J. Herbillon, CPB-CNRS, B.P.5, 54501 Vandoeuvre-les-Nancy Cedex, France.

International Symposium on Fertilization and the Environment, Leuven, Belgium, 27-30 August, 1989.

Information: K.U. Leuven, Laboratory of Soil Fertility and Soil Biology, Kardinaal Mercierlaan 92, B-3030 Leuven (Heverlee), Belgium.

10th International Symposium on Soil Biology, Keszthely, Hungary, August 27-31, 1989.

Information: Prof. Dr. J. Szegi, Research Institute for Soil Science and Agric. Chemistry, Pf 35, 1525 Budapest, Hungary.

9th International Clay Conference (AIPEA), Strasbourg, France, August 28-September 2, 1989.

Information: Dr. Hélène Paquet, Institut de Géologie, 1 rue Blessig, 67084 Strasbourg, France.

5th International Symposium on Paleolimnology, Ambleside, U.K., August 31 – September 6, 1989.

Information: Prof. Frank Oldfield, Dept. of Geography, University of Liverpool, P.O.Box 147, Liverpool L69 3BX, United Kingdom.

MAB Workshop on Management of the Forest Ecosystems in Humid Tropical Regions; comparative approach between Africa and the Americas, Cayenne, French Guyane, September 1989.

Information: H.F. Maître, CTFT/CIRAD, 45 bis Avenue de la Belle Gabrielle, 94736 Nogent-sur-Marne Cedex, France.

International Symposium on Environmental Biogeochemistry, Moscow, USSR, September 2-8, 1989.

Information: Prof. M.V. Ivanov, Institute of Microbiology, USSR Academy of Sciences, Prospekt 60-letiya Oktyabrya 7, 117811 Moscow, USSR.

2nd International Conference on Geomorphology, Frankfurt/Main, FRG, September 3-9, 1989. Theme: 'Geomorphology and Geo-ecology'.

Information: Prof. Dr. A. Semmel, Inst. für Physische Geographie, Universität Frankfurt, Postfach 111932, D-6000 Frankfurt/Main 11, F.R. of Germany.

Réunion Internationale sur les Horizons du Sol: concept d'horizon, leur utilisation dans la caractérisation, la classification et la cartographie des sols, Rennes, France, Septembre 4-6, 1989 (co-sponsoring by ISSS Commission V). Followed by a meeting, 7-10 September 1989, on **the Development of an International Reference Base for Soil Classification (IRB)**

Information: M. Pierre Arousseau, ENSA Chaire de Sciences du Sol, 65 rue de Saint-Brieuc, 35042 Rennes Cedex, France; *ou:* Prof. Dr. R. Dudal, Fac. of Agr. Sciences, K.U. Leuven, 92 Kardinaal Mercierlaan, 3030 Leuven, Belgium.

7th International Conference 'Chemistry for Protection of the Environment', September 4-7, 1989, Lublin, Poland.

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

11th International Congress of the International Commission of Agricultural Engineering, Dublin, Ireland, September 4-8, 1989.

Information: M. Carlier, Secr. General CIGR, 17 rue de Javel, 75015 Paris, France.

Meeting on the Microbiology and Chemistry of Nitrogen Turnover in Soils: Processes and Consequences, Reading, England, September 11-14, 1989.

Information: Dr. C. Vincent, Dept. of Soil Science, University of Reading, London Road, Reading RG1 5AQ, United Kingdom.

International Conference on Modelling of Global Climate Change and Variability (IAHS), Hamburg, F.R. of Germany, September 11-15, 1989.

Information: R.L. Dumenit, Meteorologisches Institut der Universität Hamburg, Bundesstrasse 55, D-2000 Hamburg 13, F.R. Germany.

Conference on Soil Melioration and Landscape Protection and Improvement, Sofia, Bulgaria, September 12-16, 1989.

Information: Dr. Marin Penkov, 1 Christo Smirnenski Blvd., Sofia 1421, Bulgaria.

Workshop 'Laterites and Applications in Environmental and Agricultural Sciences', September 13-15, 1989, Marseille, France.

Information: D. Nahon, Université d'Aix-Marseille III, Geosciences des Environnements Tropicaux, Case 431, Avenue Escadrille Normandie-Niemen, 13397 Marseille Cedex 13, France.

Symposium on Aerospace Survey and Natural Disaster Reduction, September 14-16, 1989, Enschede, the Netherlands.

Information: Symposium Committee, ITC, P.O. Box 6, 7500 AA Enschede, the Netherlands.

3rd International Wetlands Conference, Conservation and Development: the Sustainable Use of Wetland Resources, Paris, France, September 19-23, 1989.

Information: Musée d'Histoire Naturelle, Lab. d'Evolution des Systèmes Nat., 36 rue Geoffroy St-Hilaire, 75231 Paris, France.

International Conference and Workshop on Global Natural Resource Monitoring and Assessments: Preparing for the 21st Century, Venice, Italy, September 24-30, 1989.

Information: Mr. H.Gyde Lund, c/o USDA Forest Service TM, P.O. Box 96090, Washington, DC 20090-6090, U.S.A.

2nd Iberian Quaternary Meeting, Madrid, Spain, September 25-29, 1989.

Information: Dra. T.A. Campos, Instituto de Edafología y Biología Vegetal (CSIC), Serrano 115-do, 28006 Madrid, Spain.

3rd Multidisciplinary Conference on Sinkholes and the Engineering and Environmental Impacts of Karst, Petersburg FL, U.S.A., October 1-4, 1989.

Information: 3rd Multidisciplinary Conference, Florida Sinkhole Research Institute, University of Central Florida, Orlando, FL 32816, U.S.A.

International Symposium on Groundwater Management: Quality and Quantity, Benidorm, Spain, October 2-5, 1989 (IAHS).

Information: Dr. J. Andreu, Symposium Secretary, E.T.S. de Ingenieros Caminos, Univ. Politécnica, Camino de Vera s/n, 46071 Valencia, Spain.

International Soil Correlation Meeting on Wetland Soils, New Orleans, Louisiana, USA, October 2-14, 1989 (SMSS).

Information: Dr. H. Eswaran, SMSS, P.O. Box 2890, Washington DC 20013, USA.

International Conference on Environmental Education, October 3-7, 1989, Goa, India.

Information: Dr. Desh Bandhu, Organising Secretary, P.O. Box 7033, New Delhi, India.

***International Symposium on the Dynamics of Salt-affected Soils**, Nanjing and Fung-qi, P.R. China, October 4-10, 1989 (ISSS Subcommittee A).

Information: Prof. Dr. Zhao Qiguo, Director, Institute of Soil Science, Academia Sinica, P.O. Box 821, Nanjing, P.R. China.

16th International Grassland Congress, Nice, France, October 4-11, 1989.

Information: Secrétariat, XVI Congrès Int. des Herbages, AFPE, INRA, Rue de St. Cyr, 78000 Versailles, France.

International Workshop on Indirect Methods for Estimating the Hydraulic Properties of Unsaturated Soils, Riverside, California, October 10-12, 1989.

Information: M.Th. van Genuchten, U.S. Salinity Laboratory, USDA-ARS, 4500 Glenwood Drive, Riverside, CA 92501, U.S.A.

***6th International Soil Conservation Conference**, Addis Abeba, Ethiopia, November 6-18, 1989 (ISCO; co-sponsoring by ISSS Subcommittee C).

Information: Mr. Kebede Tato, 6th ISCO Conference, P.O. Box 2597, Addis Abeba, Ethiopia. Telex: 21619; or: Dr. Hans Hurni, Geography Institute, Hallerstrasse 12, 3012 Berne, Switzerland.

International Conference and Workshops on Climatic Fluctuations and their Socio-Economic Impact concerning countries around the Atlantic Ocean, Toulouse, France, November 13-17, 1989.

Information: J.-C. André, Centre National de Recherches Météorologiques, F-31057 Toulouse Cedex, France.

IV Simposio Latinoamericano sobre Sensores Remotos, 20-24 de Noviembre, 1989, San Carlos de Bariloche, Argentina.

Información: CICELPA-INTI, Secretaria del IV Simposio Latinoamericano sobre Sensores Remotos, C.C. 157, 1650 San Martín, Prov. de Buenos Aires, Rep. Argentina.

International Training Workshop on Research in Soil Management and Agroforestry (IBSRAM/ICRAF), Nairobi, Kenya, November 26-December 3, 1989.

Information: Dr. A. Young, ICRAF, P.O. Box 30677, Nairobi, Kenya; or: Dr. P. Ahn, IBSRAM, Box 9-109, Bangkok 10900, Thailand.

European Conference on Landscape-ecological Impact of Climatic Change (assessing the potential effect of a climatic change on terrestrial ecosystems and landscapes in Europe), Lunteren, the Netherlands, December 3-7, 1989.

Information: Drs. R.S. de Groot, Dept. of Nature Conservation, Wageningen Agricultural University, Ritzema Bosweg 32a, 6703 AZ Wageningen, the Netherlands. telex 45015 bluwg-nl.

National Conference on Geosphere-Biosphere Change in Southern Africa, Cape Town, December 4-8, 1989.

Information: The SA-IGBP Secretariat, Foundation for Research Development, CSIR, P.O. Box 395, Pretoria 0001, South Africa.

1990

International Symposium on Land Drainage for Salinity Control in Arid and Semi-arid Regions, Cairo, Egypt, 26 February – 3 March, 1990.

Information: Drainage Research Institute (DRI), Irrigation Bldg., 13 Giza Street, El Giza, Cairo, Egypt. telex: 94014 exwap un; *or:* ILRI, P.O.Box 45, 6700 AA Wageningen, the Netherlands. telex: 75230 visi nl.

***International Meeting on 'Global Soil Dynamics in a Changing Environment'**, Nairobi, Kenya, February 12-16, 1990. UNEP; co-sponsoring by ISSS Committee on International Programmes).

Information: Prof. Dr. H. Scharpenseel, Chairman ISSS-CIP, Institut für Bodenkunde, Allende-Platz 2, 2000 Hamburg 13, F.R. of Germany; *or:* A. Ayoub, Environmental Management, UNEP, P.O. Box 30552, Nairobi, Kenya.

***XI Congreso Latinoamericano y II Congreso Cubano de la Ciencia del Suelo**, 11-17 de marzo, 1990, Ciudad Habana, Cuba.

Información: Sociedad Cubana de la Ciencia del Suelo, Finca Tres Margaritas, Km81/2, Carretera de Vento, Capdevila, Apartado Postal 8022, Ciudad de la Habana 10800, Cuba.

International Conference on Metals in Soils, Waters, Plants and Animals, Orlando, Florida, April 30-May 3, 1990.

Information: Dr. D.C. Adriano, Savannah River Ecology Lab, Drawer E, Aiken SC 29802, U.S.A.

8th World Congress of the International Association of Agricultural Librarians and Documentalists (IAALD), Budapest, Hungary, May 28-31, 1990.

Information: IAALD VIII. Congress, Organizing Committee, AGROINFORM, Ms Virág Sípós, Pf. 15, H-1253 Budapest, Hungary.

4th International Conference on Geotextiles, Geomembranes and Related Products, the Hague, the Netherlands, May 28 – June 1, 1990.

Information: G. den Hoedt, Holland Organizing Centre, Lange Voorhout 16, 2514 EE The Hague, the Netherlands.

International Symposium on Research Needs and Applications to Reduce Erosion and Sedimentation in Tropic Steeplands, Suva, Fiji, June 11-15, 1990.

Information: Prof. D.E. Walling, Dept. of Geography, University of Exeter, Amory Building, Rennes Drive, Exeter EX4 4RY, England.

2nd International Symposium on Plant-Soil Interactions at low pH, Beckley, West Virginia, USA, June 24-29, 1990.

Information: Dr. Paul Murrmann, Conference Chairman, USDA-ARS, Appalachian Soil & Water Conservation Research Laboratory, P.O.Box 1061, Beckley, West Virginia 25802-1061, USA.

International Symposium on Climatic Risk in Crop Production, July 1990, Brisbane, Australia.

Information: Mr. Vic. Catchpoole, Symposium Secretary, CSIRO Division of Tropical Crops & Pastures, Cunningham Laboratory, 306 Carmody Road, St. Lucia, Qld 4067, Australia.

12th International ICSU-CODATA Conference 'Data for Discovery', Columbus, Ohio, USA, July 15-19, 1990.

Information: 12th International CODATA Conference, Applied Information Technologies Institute, 1880 Mackenzie Drive, Suite 111, Columbus, OH 43220, U.S.A.

3rd Desert Development Conference: Desert Development: Balancing Economic and Ecological Constraints, July 16-21, 1990, Beijing, People's Republic of China.

Information: Prof.Dr. Adel El-Beltagy, Undersecretary of State for Land Reclamation, Ministry of Agriculture and Land Reclamation, Dokky, Egypt.

4th International Symposium on Spatial Data Handling, Zurich, Switzerland, July 23-27, 1990.

Information: Symposium Secretariat, Geographisches Institut, Universität Zürich, Winterthurerstrasse 190, CH-8057 Zürich, Switzerland.

10th Congress of the International Union of Pure and Applied Biochemistry (IUPAB), India, August 1990.

Information: J. Tigyí, Secretary IUPAB, Institute of Biophysics, Medical University, Szigeti ut 12, 7643 Pécs, Hungary.

14th Congress of the International Commission on Irrigation and Drainage (ICID), Rio de Janeiro, Brazil, August 1990.

Information: Secretariat ICID, 48 Nyaya Marg. Chanakyapuri, New Delhi 11, India.

5th International Congress of the International Humic Substances Society (IHSS), Nagoya, Japan, August 5-9, 1990.

Information: Dr. Kiyoshi Zsutsuki, Nagoya University, Faculty of Agriculture, Chikusa, Nagoy 464, Japan.

11th International Congress of the International Union for the Study of Social Insects (IUSSI), Bangalore, India, August 5-11, 1990.

Information: The Secretary, 11th Int. Congres IUSSI, Dept. of Entomology, University of Agricultural Sciences, G.K.V.K. Campus, Bangalore 560 065, India.

6th International Congress of the International Association of Engineering Geology, Amsterdam, the Netherlands, August 6-10, 1990.

Information: Secretary-General of the 6th Intl. Congress IAEG-1990, P.O. Box 157, 2000 AD Haarlem, The Netherlands.

19th World Congress of the International Union of Forestry Research Organisations (IUFRO), Montreal, Canada, August 7-18, 1990.

Information: IUFRO, Tirolergarten, Schönbrunn, A-1131 Vienna, Austria.

****14th INTERNATIONAL CONGRESS OF SOIL SCIENCE**, Kyoto, Japan, August 12-18, 1990.

Information: Dr. K. Kumazawa, Japanese Society of Soil Science and Plant Nutrition, 26-10-202, Hongo 6-chome, Bunkyo-ku, Tokyo 113, Japan.

Regional Conference of the International Geographic Union on Asian Pacific Countries, August 12-20, Beijing, China.

Information: IGU Conference Secretariat, The Geographical Society of China, Building 917, Datun Road, Beijing 100012, China.

International Symposium on Remote Sensing and Water Resources, Enschede, the Netherlands, 20-24 August 1990.

Information: Secretariat of the International Symposium 'Remote Sensing and Water Resources', ITC (BPC), P.O.Box 6, 7500 AA Enschede, the Netherlands.

23rd International Horticultural Congress (ISHS), Firenze, Italy, August 22-Sept.1, 1990.

Information: Org. Comitta, Societa Orticola Italiana, Via G. Donizetti 6, 50144 Firenze, Italy.

5th International Congress of Ecology, Yokohama City, Japan, August 23-30, 1990.

Information: Dr. A. Miyawaki, Inst. of Environmental Science & Technology, Yokohama National University, 156 Tokiwadai, Hodogaya-ku, Yokohama 240, Japan.

4th Conference of the African Association for Biological Nitrogen Fixation, Ibadan, Nigeria, September 25-29, 1990.

Information: Dr. K. Mulongoy, IITA, Oyo Road, PMB 5320, Ibadan, Nigeria; *or:* IITA, c/o L.W. Lambourn & Co., Carolyn House, 26 Dingwall Road, Croydon CR9 3EE, England.

International Symposium on the Use of Stable Isotopes in Plant Nutrition, Soil Fertility and Environmental Studies, Vienna, Austria, October -5, 1990.

Information: Dr. G.D. Bowen, Joint FAO/IAEA Division, IAEA, P.O. Box 100, A-1400 Vienna, Austria.

8th International Soil Correlation Meeting: Classification and Management of Wet Soils, Louisiana, Texas, October 7-20, 1990.

Information: Dr. Hari Eswaran, Soil Management Support Services, P.O. Box 2890, Washington D.C. 20013, U.S.A.

International Conference on Agricultural Engineering, Berlin, Fed.Rep. of Germany, October 24-27 1990.

Information: Erich Luckey, Manager Agricultural Division, Verein Deutscher Ingenieure, Graf-Recke-Straße 84, Postfach 1139, 4000 Düsseldorf 1, F.R.G.

International Symposium on Nitrates, Agriculture, Water, Paris, France, November 7-8, 1990.

Information: ADEPRINA, Institut National Agronomique Paris-Grignon, 16 rue C. Bernard, 75231 Paris, France.

1991

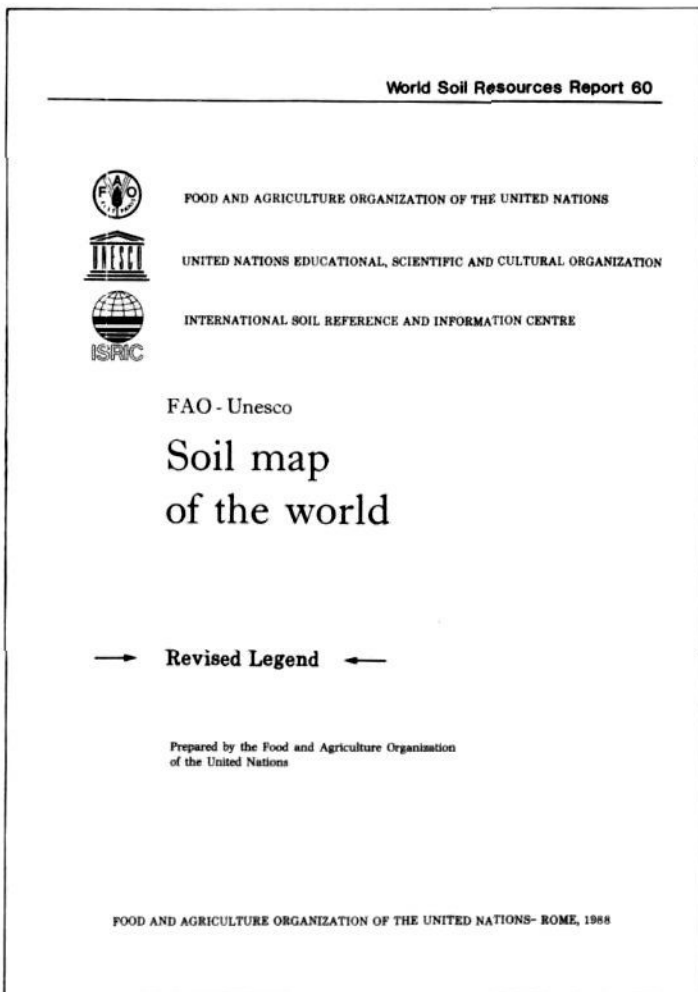
12th International Conference on Tillage for Sustainable Crop Production, IITA, Ibadan, Nigeria, July 8-12, 1991.

Information: Dr. R. Lal, Dept. of Agronomy, 2021 Coffey Road, The Ohio State University, Columbus, Ohio 43210-1086, U.S.A.

1992

***11th International Soil Zoology Colloquium**, August 1992, Jyvaskyla, Finland. (ISSS Subcommission D).

Information: K. Lee, CSIRO, Division of Soils, P.B.2, P.O. Glen Osmond, SA 5064, Australia.



LIST OF ISSS PUBLICATIONS/LISTE DES PUBLICATIONS DE L'AISS/ LISTE DER IBG VERÖFFENTLICHUNGEN

(International Congresses of Soil Science and Meetings of the Commissions and Working Groups; commission meetings before 1945 not indicated)

1st International Congress of Soil Science, 1927, Washington, USA.

Proceedings (5 volumes) available from the Soil Science Society of America, 677 South Segoe Road, Madison, Wisconsin 53711, USA.

2nd International Congress of Soil Science, 1930, Moscow, USSR.

Proceedings (7 volumes) available from the State Publishing House of Agricultural Cooperative and Collective Farm Literature, Selkolhozgiz, Moscow, USSR (1933).

3rd International Congress of Soil Science, 1935, Oxford, England.

Proceedings out of print.

4th International Congress of Soil Science, 1950, Amsterdam, Netherlands.

Proceedings out of print.

Joint Meeting Commissions II and IV, Dublin, Ireland, 1952.

Proceedings (4 volumes) available from Dr. T. Walsh, Agricultural Institute, 33 Merrion Road, Dublin, Ireland.

5th International Congress of Soil Science, 1954, Léopoldville Congo.

Proceedings (4 volumes) available from Société Belge de Pédologie, Krijgslaan 271, Gent, Belgium.

6th International Congress of Soil Science, 1956, Paris, France.

Proceedings out of print.

Meeting of Commission VI on *Supplemental Irrigation*, 1958, in Copenhagen, Denmark.

Proceedings, edited by E.W. Schierbeek under the title 'Report on the Conference on Supplemental Irrigation', available from the Institute for Land and Water Management Research ICW, P.O. Box 35, 6700 AA Wageningen, the Netherlands.

Joint Meeting of Commission II and IV, Hamburg, 1958.

Proceedings, edited as 2 special volumes of the periodical 'Zeitschrift für Pflanzenernährung, Düngung und Bodenkunde' (1958, 1959), available from Verlag Chemie GmbH, Postfach 1260/1280, D-6940 Weinheim, West Germany.

1st International *Soil Zoology* Colloquium (Commission III), Rothamsted, England, 1958.

Proceedings, edited by P.W. Murphy under the title 'Progress in Soil Zoology' (1962), available from Butterworths & Co Ltd, 88 Kingsway, London WC2, England.

First Meeting of the ISSS Working Group on *Soil Micromorphology*, Braunschweig, Fed. Rep. of Germany, 1958.

Proceedings, edited by H.J. Altemüller und H. Frese under the title 'Arbeiten aus dem Gebiet der Mikromorphologie des Bodens' (1962), out of print by Chemie Verlag, Weinheim, but also Published in Volumes 97, 98 and 99 of the periodical 'Zeitschrift für Pflanzenernährung, Düngung und Bodenkunde'.

7th International Congress of Soil Science, 1960, Madison, Wis., USA.

Proceedings out of print.

Joint Meeting of Commissions IV and V, Palmerston, New Zealand, 1962.

Proceedings, edited by M.G.J. Neale under the title 'Transactions of joint meeting Comm. IV and V of ISSS, International Soil Conference', available from: Publications Section, Science Information Division, DSIR, P.O.Box 9741, Wellington, New Zealand.

2nd International *Soil Zoology* Colloquium (Commission III), Oosterbeek, Netherlands, 1962.

Proceedings, edited by J. Doeksen and J. van der Drift under the title 'Soil Organisms' (1963), out of print with North Holland Publ.Co, Amsterdam.

8th International Congress of Soil Science, 1964, Bucharest, Rumania.

Proceedings (5 volumes) available from Societatea Nationala Romana Pentru Stiinta Solului, Boul. Marasti Nr.61, Bucuresti, Romania.

- Second Meeting of the ISSS Working Group on *Soil Micromorphology*, 1964, Arnhem, the Netherlands.
 Proceedings, edited by A. Jongerius under the title 'Micromorphology of Soils', available from Elsevier Scientific Publishing Co., P.O. Box 211, Amsterdam, the Netherlands.
- Joint Meeting Commission II and IV, 1966, Aberdeen, Scotland.
 Proceedings, edited by G.V. Jacks under the title 'Soil Chemistry and Fertility', available from Prof. J. Tinsley, Dept. of Soil Science, University of Aberdeen, Meston Walk, Old Aberdeen AB9 2UE, Scotland.
- Meeting Commission V on *Mediterranean Soils*, 1966, Madrid, Spain.
 Proceedings available from Sociedad Española de Ciencia del Suelo, Serrano 115, Madrid-6, Spain.
- 3rd International *Soil Zoology* Colloquium (Commission III), Braunschweig Völkenrode, BRD, 1966.
 Proceedings, edited by O. Graff and J.E. Satchell under the title 'Progress in Soil Biology' (1967), available from Friedrich Vieweg & Sohn, Braunschweig, and North Holland Publ.Co. Amsterdam.
- 9th International Congress of Soil Science**, 1968, Adelaide, Australia.
 Proceedings (4 volumes) available from Angus & Robertson, Ltd., 221 George Street, Sydney, N.S.W. 2000, Australia.
- Meeting of Subcommittee on *Salt-Affected Soils*, 1969, Yerevan, Hungary.
 Proceedings, edited by I. Szabolcs et al. under the title 'Symposium on the Reclamation of Sodic and Soda-Saline Soils' (as vol.18/1969 supplement of 'Agrokémia es Talajtan') available from the Hungarian Research Institute of Soil Science and Agricultural Chemistry, Hermann Ottó út. 15, 1022 Budapest II, Hungary.
- Third Meeting of the ISSS Working Group on *Soil Micromorphology*, 1969, Wrocław, Poland.
 Proceedings, edited by S. Kowalinski et al under the title 'Soil Micromorphology' (1972), available from Państwowe Wydawnictwo Naukowe, Oddział Wroclawiu, Wrocław, Poland, or Prof.Dr. S. Kowalinski, Academy of Agriculture, Dept. of Soil Science, ul. Grunwaldska 54, 50-357 Wrocław, Poland.
- Joint Symposium of ISSS and INQUA on the *Age of Parent Materials and Soils*, 1970, Amsterdam, Netherlands.
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Explanatory text volume n^o1 ('Legend'; 60 pages) comprises an introduction to the Map, an explanation and correlation of the nomenclature, a description of the diagnostic horizons and properties and the phases employed, a definition of the soil units and a key. The Legend volume is in four languages: English, French, Spanish and Russian, the explanatory text volumes in English, French and/or Spanish.

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NEW PUBLICATIONS NOUVELLES PUBLICATIONS NEUE VERÖFFENTLICHUNGEN

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 seat of the Society, c/o 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 siège de l'AISS, p/a Centre International de Référence et d'Information Pédologique (ISRIC) à Wageningen, Pays-Bas.

Die Titel neuer Veröffentlichungen sind hier zu Information angeführt. Bitte richten Sie Ihre Bestellungen nicht an das IBG Sekretariat sondern an den Buchhandel oder direkt an die Verlage. Fast alle Veröffentlichungen sind jedoch zu besichtigungen an der Stelle der IBG, p/a Internationales Bodenreferenz und Informations Zentrum (ISRIC) im Wageningen, Holland.

GEOBASE. Elsevier/GeoAbstracts, Norwich.

The coverage of the database Geobase is currently defined by that of the associated printed journals: Geographical Abstracts – Physical Geography, Geographical Abstracts – Human Geography, Geological Abstracts, Ecological Abstracts and International Development Abstracts.

Furthermore, PhD. and Masters theses from the U.S.A. and U.K. will start appearing regularly from the May 1989 update onwards.

For more information: Geobase, Elsevier/GeoAbstracts, Regency House, 34 Duke Street, Norwich NR3 3AP, England.

Development of Farming Systems. Report over the five-year period 1980-1984. J.C. Zadoks, editor. Pudoc, Wageningen, 1989, 96 p. ISBN 90-220-0969-6.

Realistic alternatives to conventional agriculture are much in demand. Organic farming, 'bio-dynamic' farming, and integrated farming are current catchwords.

In the Netherlands, several alternatives are being studied on three neighbouring farms, all under one management. The Current Farm represents conventional farming with high levels of inputs. The Integrated Farm represents agriculture with modest levels of inputs, somewhat reduced yields and acceptable financial results. The Organic Farm represents farming according to 'bio-dynamic' (anthroposophic) principles: in this case cattle are kept, recycling is practised and artificial fertilizers and pesticides are not used.

The project has had mixed fortunes. This book evaluates developments during the first five years (1980-1984): the failures, the successes, the technical problems, and the economic results; and it outlines the prospects for the future.

Price: Dfl 50,00 or US\$ 29,00.

Orders to: Pudoc, P.O. Box 4, 6700 AA Wageningen, the Netherlands.

Soil Structure and Fabric. R. Brewer and J.R. Sleeman. CSIRO, East Melbourne, 1988, 173 p., 161 photos. ISBN 0-643-04859-6. Hardbound.

This book sets out a method of describing the structure and fabric of soils that proceeds consistently from macroscopic descriptions in the field to descriptions from standard thin sections as viewed with a light microscope. Most of the book is devoted to the description and classification of the microscopic characteristics of soils.

It is intended for the use of pedologists and those geologists who are concerned with the study of sediments, particularly unconsolidated sediments. The microscopic description of soil materials from thin sections has generally been regarded by most pedologists and geologists as an exercise somewhat apart from their sphere of interest. In this book, the authors hope to overcome this prejudice by using the geological concepts of structure and fabric, and setting out the logical progression from macroscopic to microscopic description. Pedologists should have some familiarity with the microscopic characteristics of soils, just as any geologist would be expected to have some skill in micropetrology in order to appreciate the intricate make-up of the materials with which he is primarily concerned. Most of this book is devoted to microscopic characteristics of soils, and this reflects the great amount of detail concerning the structure and fabric of soils that can be obtained from microscopic observations.

The book is comprised of twelve chapters in five sections with appendices, references and an index. The sections are: classification of soil structures and fabrics; systematic nomenclature; application to soil profiles; tables and schedules for description and classification of structures, fabrics, somas and soil profiles; and plates depicting structures, fabrics and somas.

Price: US\$ 30.00, plus airmail postage.

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

Biogeomorphology. Heather Viles, editor. Basil Blackwell, Oxford and New York, 1988, 365 p. ISBN 0-631-15405-1. Hardbound.

Biogeomorphology is concerned with the influence of landforms on the distribution and development of plants, animals and micro-organisms; and with the influence of plants, animals and microorganisms on earth surface processes and the development of landforms. In most situations these influences are interdependent with respect to environmental equilibrium or change.

This volume aims to provide a survey of current knowledge on biological influences on geomorphological processes. The organic component of landscape development has often been ignored by geomorphologists, although much exciting work has been done on pertinent topics in recent years.

This book is divided according to particular geographical area and climatic criteria. The first part of the work is concerned with organic influences on landforms in temperate fluvial environments. Part two presents evidence from tropical, arid and periglacial environments. Part three deals with coastal and karst environments.

This is the first book on this important interdisciplinary field. It will be of considerable interest to geomorphologists, geologists and biologists, as well as to those involved in environmental planning and in using or monitoring the effects of plants and animals on the surface of the earth.

Orders to: Basil Blackwell, 108 Cowley Road, Oxford, OX4 1JF, England; *or:* Basil Blackwell, 432 Park Avenue South, Suite 1503, New York, NY 10016, U.S.A.

Plant Stress-Insect Interactions. E.A. Heinrichs, editor. John Wiley & Sons, New York, Chichester, 1988, xii + 492 p. ISBN 0-471-82648-0. Hardbound.

This book was published in the Environmental Science and Technology Series, which is devoted to the study of the quality of the environment and to the technology of its conservation. Environmental science therefore relates to the chemical, physical, and biological changes in the environment through contamination or modification, to the physical nature and biological behaviour of air, water, soil, food, and waste as they are affected by agricultural, industrial, and social activities, and to the application of science and technology to the control and improvement of environmental quality.

Despite the current food surplus in some countries, there is concern that the combined effects of continued increases in the human population, loss of forests and arable crop land, and the ever-present spectre of plant stresses portend worldwide food, fiber, and lumber shortages in the future. The role of the agricultural scientist in averting these food shortages is to (1) modify the environment in which a plant grows by minimizing the abiotic and biotic stresses and (2) genetically modify plants so that they are able to tolerate the various stresses.

This book describes the various abiotic (physicochemical) and biotic stresses that affect plants, and explains the resulting physiological, chemical, and morphological responses which alter the plants' suitability as hosts for insects. Included is the first extensive treatment of the effects of nitrogen on host plant suitability to insects. Chapter 1 introduces the general aspects of plant stress and discusses the effects of plant stress on global food production. Chapters 2 through 9 describe the various physicochemical stresses that affect plants, the plants' responses, and their resulting suitability as hosts for insects. Covered are the effects of soil minerals, moisture, temperature, light, insecticides, herbicides and growth regulators, air pollution, and mechanical damage. The biotic stress associated with herbivorous insects is discussed in chapter 10. The interactions of plant stress, insect pests, and natural enemies are addressed in chapter 11. Chapter 12 explains the effects of plant pathogens on plant-insect interactions.

The book contains a bibliography of over 1300 references.

Price: £ 40.60

Orders to: John Wiley & Sons, Baffins Lane, Chichester, West Sussex PO19 1UD, England; *or:* John Wiley & Sons, 605 Third Avenue, New York NY 10158-0012, U.S.A.

World Resources 1988-89. A report by the World Resources Institute and the International Institute for Environment and Development, in collaboration with the United Nations Environment Programme. Basic Books, New York, 1988, xii + 372 p. ISBN 0-465-09241-1 (paperback); 0-465-09240-3 (clothbound).

The World Resources series is the most complete, well documented and up-to-date reference book available on global resources and the environment. Building on earlier volumes, the 1988-89 edition gives special attention to environmental conditions and trends in Asia and devotes a special chapter to the critical issue of rehabilitating degraded lands.

The regular series features include over 50 data tables covering 146 countries, and 11 chapters on conditions and trends in global natural resources and the environment.

Price: US\$ 16.95 paperback; US\$ 32.95 clothbound.

Orders to: Basic Books, 10 East 53rd Street, New York NY 10022, U.S.A.

Phosphates and Phosphoric Acid. Raw Materials, Technology, and Economics of the Wet Process. Second edition. Fertilizer Science and Technology Series 6. P. Becker. Marcel Dekker, New York and Basel, 1989, xi + 740 p. ISBN 0-8247-7976-2. Hardcover.

Five years have passed since the first edition was published, and in that time decisive trends for the phosphoric acid industry and its markets have taken place: (1) New leader countries have set up modern and efficient state-owned phosphoric acid production industries. To date, the largest plant is no longer in the United States, but in Morocco; (2) The volume of phosphoric acid trade has reached almost 4 million tons of P_2O_5 as acid by the end of 1987. This is equivalent to an average increase of 6% per year; (3) Large phosphoric acid-demanding areas, such as India with an 8% yearly increase, have promoted a world-wide acid trade. China is showing a similar trend.

The present fully revised, expanded and updated second edition, gives a lot of valuable information in text, graphs, tables and illustrations. It shows industrial chemists, and engineers not only how to enhance productivity and quality, but also to save on energy and raw materials, and to lower investment and maintenance costs. The objective of this book is to improve technology by increasing the understanding of phosphates and in communicating the progress made in fertilizer technology.

Price: US\$ 165.00 in U.S.A. and Canada, US\$ 198.00 elsewhere.

Orders to: Marcel Dekker, Inc., 270 Madison Avenue, New York NY 10016, U.S.A.

National Soils Conference. Review Papers. J. Loveday, editor. Australian Society of Soil Science, Nedlands, 1988, iv + 180 p. ISBN 0-9587460-1-X.

This volume contains the invited review papers presented at the National Soils Conference, held at Canberra, May 1988. The first paper entitled 'Australian Soils - The Last 200 Years' discusses changes, both good and bad, that have taken place since the occupation of the continent by Europeans. The other papers introduced sessions devoted to soils of temperate and tropical Australia and strategies for their conservative management. The themes of these sessions were, (i) Chemical and physical soil degradation, (ii) Soil properties and distribution in the temperate regions, (iii) Fertility of temperate region soils, (iv) Soil physical processes and reclamation, and (v) Soils of tropical and subtropical regions.

Price: Austr. \$ 20.00.

Orders to: Dr. W.J. Bond, Dir. of Soils, CSIRO, G.P.O. Box 639, Canberra City, A.C.T. Australia.

Agricultural Waste Management and Environmental Protection. Proceedings 4th International Symposium of CIEC, 11-14 May 1987, Braunschweig. E. Welte and I. Szabolcs, editors. International Scientific Centre of Fertilizers (CIEC) and Federal Agricultural Research Centre (FAL), 1988. Vol.1, 512 p., ISBN 3-88452-623-5; Vol.2, 448 p., ISBN 3-88452-624-3.

For many years the International Scientific Centre of Fertilizers (CIEC) has concentrated its activities and endeavour on an efficient and proper use of mineral and organic fertilizers regarding their adequate supply in the soil to maintain or even improve its fertility and to satisfy the crop's nutrient cycles and utilizing refuse and waste of agricultural and nonagricultural origin.

The present volumes contain the proceedings of the 4th CIEC symposium, which was especially dealing with the problems of the increasing amounts of waste and wastewaters.

About 200 experts from 28 countries participated and made an intensive exchange of experience, ideas and new results possible. There were 139 contributions, divided in 7 items and discussed in 7 working groups. Besides some introductory papers and a memorial speech in remembrance of the 200th birthday of the famous German pioneer of agricultural chemistry, P.C. Sprengel, three plenary lectures introduced the targets of this symposium and focused on the most urgent problems dealing with the technical and chemo-technological solutions in utilizing and recycling agricultural and non-rural wastes to avoid environmental impact and damage.

Papers were presented and discussed in the following subjects: Efficient and safe utilization of farm wastes in modern agriculture; upgrading of wastes by separation, composting and additives; agricultural use of non-rural wastes; aerobic and anaerobic treatment of animal slurries and other agricultural wastes; influence of farm and town wastes on soil properties and fertility; waste management, land application techniques and nutrient losses; and regulations for controlling the agricultural use of organic wastes.

Orders to: see below.

Protection of Water Quality from Harmful Emissions with Special Regard to Nitrate and Heavy Metals. Proceedings 5th International Symposium of CIEC, 1-4 September 1987, Balatonfüred. E. Welte and I. Szabolcs, editors. International Scientific Centre of Fertilizers (CIEC), Hungarian Society of Agricultural Sciences (MAE) and Hungarian Hydrological Society (MTH), 1989. 430 p., ISBN 3-88452-625-1.

Within the framework of the aims and activities of CIEC the 5th Symposium considered the environmental aspects of increasing rates of fertilizer and manure application, especially with respect to the nitrate pollution of waters. About 150 experts from 23 countries participated in the conference, which was sponsored by FAO and WHO.

Orders to: Goltze Druck, Druckerei und Verlag, P.O. Box 1944, D-3400 Göttingen, Fed. Rep. of Germany.

European Directory of Agrochemical Products. 3rd Edition. H. Kidd, D. Hartley, J.M. Kennedy and D.R. James, editors. Royal Society of Chemistry, Information Services, Cambridge, 1988. Volume 1, Fungicides, 537 p., ISBN 0-85186-637-5; Volume 2, Herbicides, 637 p., ISBN 0-85186-683-2; Volume 3, Insecticides, Acaricides, etc., 632 p., ISBN 0-85186-693-X; Volume 4, Plant Growth Regulators, etc., 339 p., ISBN 0-85186-703-0. Complete Directory ISBN 0-85186-713-8.

The range of agrochemical products used in Europe alone is extensive. New products are constantly appearing on the market and others are being withdrawn; restrictions on the sale and use of products are also made on environmental grounds.

Data on such products have so far not been collectively available in one language in one publication, and it is to fill this gap that this directory has been compiled and is to be reissued in updated form on regular basis. The information it provides should be of great value to agrochemical manufacturers and vendors, especially those involved in exporting and importing, as well as to government bodies, showing how the suitability and safety of particular products are regarded internationally. Finally the many users of agrochemicals in agriculture, horticulture etc. will find the usage information of great value in the resolution of plant-protection problems. The information is arranged into sections, each of which details products with the same constituent active ingredients. These sections are further subdivided by country. For each entry the uses of the product are given, as well as the marketing company, formulation type, and active ingredient proportions. Indexes contain information on active ingredients, and on product names. The *Agrochemicals Handbook* is a companion volume. The directory and this handbook are available for online searching.

Price for Complete Directory: £ 235.00 or US\$ 495.00

Orders to: Royal Society of Chemistry, Distribution Centre, Blackhorse Road, Letchworth, Herts. SG6 1HN, England; *or:* CRC Press, 2000 Boulevard N.W., Boca Raton FL 33431, U.S.A; *or:* D.A. Books, P.O. Box 163, Mitcham VIC.3132, Australia.

Classification, Management and Use Potential of Swell-Shrink Soils. Transactions International Workshop Swell-Shrink Soils, Nagpur, October 1988. National Bureau of Soil Survey and Land Use Planning, Oxford and IBH Publ.Co., Ltd, 1988, 267 p. ISBN 81-204-0378-9.

The ever-increasing demand of a growing population can only be met through the scientific utilisation of our finite natural resources. The first option in this direction lies in increasing the cultivated area and the second is to increase per hectare yield from areas which produce much below their normal potential. The swell-shrink soils occurring widely under varied climatic conditions, mainly tropical and subtropical, produce much less than other soils.

This publication contains the proceedings of the first International Workshop on Swell-Shrink Soils held in India under the auspices of the International Society of Soil Science. Knowledge on basic properties and understanding of these soils, their responses to different use patterns, management problems and potentials and influence of irrigation will be great help in planning developmental activities for increased agricultural production of the swell-shrink soils which are drought prone and under utilized.

The volume presents six lead papers on different themes followed by voluntary papers in seven technical sessions. Papers include results of both basic research in pedology and soil and water relationships, and applied research on land and water management, farming systems, and impact of irrigation.

Orders to: Oxford & IBH Publ. Comp., 66 Janpath, New Delhi 110 001, India.

Benchmark Swell-Shrink Soils of India – morphology, characteristics and classification. Compiled by S. Lal, R. Srivastava, T. Bhattacharyya and J. Prasad. Edited by J.L. Sehgal and S. Lal. Soils Bulletin, NBSS Publ.19. National Bureau of Soil Survey and Land Use Planning, Nagpur, 1988, 166 p. and 1 map.

Swell-shrink soils are those soils that show striking swell-shrink phenomena in their morphology. In the array of these soils, Vertisols indicate the central concept showing the evidence of pedoturbation.

The typical Vertisols in India are deep, usually calcareous, dark in colour with low chroma, high in clay content, low in organic matter content, high in cation exchange capacity, sticky and plastic and high in shrink-swell potential. They have a self-mulching surface horizon, a blocky/prismatic subsurface horizon, resting on a subsoil with wedge-shaped aggregates. They occupy about 270 million ha. in the world, 70 million ha. in India or over one-fifth of the country. They are generally fertile with high production potential and can contribute significantly in increasing the food production in the country.

A Vertisol Network was set up in 1987. The present publication, the first of a series on extensive soils in India, contains introductions on the geographic setting, morphology, genesis and classification of Vertisols and the description and analytical data of 33 benchmark profiles. A small-scale map shows the areas occupied by Vertisols and associated soils, and also includes information on slope classes and soil depth.

Orders to: National Bureau of Soil Survey and Land Use Planning, Nagpur 440 010, India.

Public Intervention in Farmer-Managed Irrigation Systems. International Irrigation Management Institute (IIMI) and Ministry of Water Resources, Govt. of Nepal. IIMI, Digana Village, 1987, iv + 323 p. ISBN 92-9090-101-9.

Landowners and cultivators worldwide have developed irrigation systems that are managed completely by farmers themselves. Although there are examples of large farmer-managed irrigation systems, generally they are small and numerous, accounting for a significant – in some countries the majority – share of irrigated area. Furthermore, a substantial portion of the population in many countries subsists on food produced in farmer-managed irrigation systems. Yet, the impact of this production on national economies often goes unrecognized. Until recently these systems were often ignored by irrigation agencies and in some cases were not included in national statistics of irrigated area.

There is now a growing recognition of the importance of farmer-managed irrigation systems, and irrigation agencies in many countries are increasing assistance to these systems. The main purpose of public assistance programs is to enhance agricultural production by increasing the water supply and improving its reliability. It is expected that such assistance will result in an expansion of the area irrigated or intensification of crop production or both.

Research on farmer-managed irrigation systems is one of several primary program areas of the International Irrigation Management Institute (IIMI), and is oriented around the theme of public intervention to assist these systems. In Nepal, IIMI collaborates with the Water and Energy Commission Secretariat (WECS) of the Ministry of Water Resources on an action research project to develop processes for assisting farmer-managed systems.

To provide a forum for discussing research issues related to farmer-managed irrigation systems and programs to assist them, an international conference was held in August 1986 in Katmandu, Nepal. The main objectives of the conference were to identify and more clearly define research issues, and to discuss research methodology and how an international research network could best facilitate further research on the identified issues. The 18 papers published in this volume were presented and discussed. They represent recent and ongoing research on farmer-managed irrigation systems, as well as agencies' experiences in assisting these systems.

Orders to: IIMI, Digana Village via Kandy, Sri Lanka.

Wastelands Diagnosis and Treatment. H.R. Yadav. Concept Publ. Comp., New Delhi, 1987, 249 p. Bound.

The enormous pressure of population and rapid industrialization has registered a decline of per capita available cultivable land in India. A part of the limited physical land resources is degrading and the area of wastelands is on the increase.

This book defines, identifies, recommends suitability classifications, diagnosis and suggests treatment and planning strategies for reclamation of wastelands in India, along with their functional economics. The expansion of land through wastelands reclamation for profitable and increased agricultural productivity is the fundamental premise of this work.

Price: Rs 190 (in India) or US\$ 38.

Orders to: see below.

Global Research on Drainage in Agriculture 1960-1986. S.K. Gupta and I.C. Gupta. Concept Publ. Comp., New Delhi, 1987, viii + 661 p. ISBN 81-7022-026-2. Hardbound.

This annotated bibliography contains over 1500 entries relating to research on drainage in agriculture. The abstracts are arranged alphabetically by name of author(s). To facilitate a quick retrieval, subject and author indexes are included.

Price: Rs. 500 (in India) or US\$ 100.

Orders to: Concept Publ. Comp., H-13, Bali Nagar, New Delhi 110 015, India.

Introduction to Ecological Biochemistry. Third edition. J.B. Harborne. Academic Press, London, San Diego, 1988, xv + 356 p. ISBN 0-12-324684-9.

The last two decades have witnessed the growth of a new inter-disciplinary subject, variously termed ecological biochemistry, chemical ecology or phytochemical ecology, which is concerned with the biochemistry of plant and animal interactions. Its development has been due in no small measure to the increasingly successful identifications of organic molecules in micro-quantities, following the application of modern chemical techniques to biological systems. It has also been due to the awareness of ecologists that chemical substances and particularly secondary metabolites such as alkaloids, tannins and terpenoids have a significant role in the complex interactions occurring between animal and animal, animal and plant or plant and plant in the natural environment.

The present text is intended as an introduction to these new developments in biochemistry that have so enormously expanded our knowledge of plant and animal ecology. Advanced level students and research workers alike will find much of value in this comprehensive text.

Price: £ 13.50.

Orders to: Academic Press, 24/28 Oval Road, London NW1 7DX, England; *or:* Academic Press, San Diego, CA 92101, U.S.A.

Loess, its Distribution, Geology and Soils. D.N. Eden and R.J. Furkert, editors. A.A. Balkema, Rotterdam and Brookfield, 1988, ix + 245 p. ISBN 90-6191-851-0. (Hardcover).

Loess consists of wind-blown dust deposited during Pleistocene cold climates and covers approximately 10% of the world's land surface. Loess soils form a broad belt across Europe and Asia from the British Isles to north-eastern China. They are also extensive in midcontinental USA, Argentina and New Zealand. Loess soils are important food-producing soils. Much of the grain belt of the USA for example is located in the loess region.

The papers in this volume were contributions to an international symposium on loess, held under the auspices of the INQUA Loess Commission in New Zealand during February 1987. All the papers presented at the symposium appear in this volume and comprise 18 full papers and 11 abstracts. They cover many aspects of loess, ranging from its distribution and properties to its stratigraphy, age and sources, in New Zealand, Antarctica, Asia, North America and Europe. Soil development and the problems of erosion are also examined and past climates are interpreted. The book contains 80 maps, photographs and diagrams.

Price: Dfl 95.00.

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.

Agricultural Expansion and Pioneer Settlements in the Humid Tropics. W. Manshard and W.B. Morgan. The United Nations University, Tokyo, 1988, vi + 305 p. ISBN 92-808-0636-X. U.N. Sales N^oE.88.111.A.4. NRTS-31/UNUP-636.

In the humid tropics of the third world, increased agricultural production to sustain a growing population, a more urbanized population, and the needs of industry and international trade have long been obtained by areal expansion, that is, by the continual creation of a production frontier. Farmers, particularly young farmers and their families, have moved outwards, seeking new land for both subsistence and commerce, often combining their agricultural activity with hunting, gathering, and timber cutting and frequently acting as the agents of political expansion. Despite many early attempts to intensify agricultural production, this frontier has continued to exist wherever fresh land has been available, often encouraged by extension of the transport network and the lowering of transport costs. There are still extensive areas of relatively empty land in the humid tropics, debatably capable of sustaining agricultural production but whose clearance must reduce the forest resource and involve serious ecological issues.

This volume contains a selection of 16 case studies covering humid tropical regions in Africa, SE Asia and Latin America, which were presented at a workshop, 'Resource Use of Frontiers and Pioneer Settlements in the Humid Tropics', in Kuala Lumpur during September 1985. The workshop was a contribution to a more general United Nations University programme on resource policy and management in the humid tropics, comprising projects on agro-forestry systems, coastal resource management, highland-lowland interactive systems, and climatic, biotic, and human interactions. Stressing the interaction between population, resources, the environment, and the development, this UNU programme and its projects were created with the aim of identifying and fostering appropriate and sustainable resource systems and, more generally, of maintaining at an international level continuing research, training, and dissemination.

Six of the papers included present the findings of mangrove research undertaken as part of the Coastal Resources Management Project; the other contributions are by invited participants and constitute general review or the results of research performed outside the UNU project.

All studies presented here concern themselves in various ways with spontaneous and planned pioneer settlement in the humid tropics, with its failures as well as its successes, its economic, social, and environmental impact and constraints, and finally, present a unique composite portrait of the state of the pioneer settlement zone in the humid tropics.

Price: US\$ 20.

Orders to: National distributors, or: UNU, Toho Seimei Bldg, 15-1, Shibuya 2-chome, Shibuya-ku, Tokyo 150, Japan.

Macmillan Dictionary of the Environment. Third edition. M. Allaby. Macmillan, London and Basingstoke, 1988, 423 p. ISBN 0-333-45562-2 (paperback), 0-333-45561-4 (hardback).

Since the first edition of this dictionary appeared in 1977, concern about the quality of the environment has led to intensified scientific research, national legislation, and the establishment of many new institutions at national and international level. This third edition reflects these developments, and also records the major 'incidents' such as the disasters at Bhopal and Chernobyl. The work has been completely revised. Many new entries have been added and every entry and cross-reference in the second edition has been scrutinized thoroughly; many have been rewritten, and a system of cross-referencing within entries has been introduced.

Price: £ 10.95 (paperback)

Orders to: Macmillan, Houndmills, Basingstoke, Hants RG21 2XS, England.

Soil Husbandry. A Practical Guide to the Use and Management of Soils. T. Batey. Soil and Land Use Consultants, Aberdeen, 1988, 157 p. ISBN 0-9513605-1-5 (paperback); 0-9513605-0-7 (hardback).

Farmers and those who work on the land come face to face with soil problems and it is they who have to make decisions on the spot, without laboratory or research facilities at hand, and with experience as the only guide. This book is aimed at them and at anyone with an interest in using and caring for the soil.

This is not strictly a textbook but more equivalent to a guide book. A framework and background to the care of soils is presented in a way that combines the principles of science with the practice and art of cultivation, used in its widest sense.

The text has been divided into two sections. The first provides some of the scientific background to good soil husbandry: the requirements of crops, the role of soil structure and soil organic matter, the importance of water in soils. The second section gives examples of soil husbandry in practice with a range of real-life problems from both arable and grassland, concentrating on practical aspects. Much emphasis is placed on the value and techniques of examination and assessment of soils directly in the field. How to examine soils and what to look for in the field is therefore one of the key sections of the book.

Price: £ 10.50 (paperback); £ 16.50 (hardback).

Orders to: Soil and Land Use Consultants, P.O. Box 294, Aberdeen AB9 8GF, Scotland, U.K.

Agroforestry Systems in the Tropics. Forestry Sciences Vol.31. P.K.R. Nair, editor. Kluwer Academic Publishers, Dordrecht, Boston. In cooperation with ICRAF, Nairobi. 1989, x + 664 p. ISBN 90-247-3790-7 (hardback).

Agroforestry (AF) is a collective name for land-use systems and technologies where woody perennials (trees, shrubs, palms, bamboos, etc.) are deliberately used on the same land-management units as agricultural crops and/or animals, in some form of spatial arrangement or temporal sequence. In agroforestry systems there are both ecological and economical interactions between the different components.

This definition implies that 1) AF normally involves two or more species of plants (or plants and animals), at least one of which is a woody perennial; 2) an AF system always has two or more outputs; 3) the cycle of an AF system is always more than one year; and 4) even the most simple AF system is more complex, ecologically (structurally and functionally) and economically, than a monocropping system.

The concepts and principles of AF have been well elucidated in several publications from the International Council for Research in Agroforestry (ICRAF) and other organizations, and, equally importantly, its limitations also have been more and more appreciated. Agroforestry is widely accepted as an approach to land use involving deliberate admixture of trees with crops and/or animals.

This book consolidates the descriptive results of a tropical project called Agroforestry Systems Inventory (AFSI), undertaken by ICRAF from 1982 to 1987. The main objective was to increase the understanding of and provide a state-of-the-art information base on existing agroforestry systems. Therefore, the project was designed to systematically collect, collate, synthesize, and disseminate information on existing agroforestry systems in developing countries. One of the major results of the project, descriptions of existing agroforestry systems, was published as a series of articles in the journal *Agroforestry Systems*. These system descriptions form the bulk of this book. Other products of the project include a microcomputer database on agroforestry systems, practices and components, and voluminous unpublished reports and records.

In addition to the many (over 25) descriptions of agroforestry systems from different parts of the world, the book consists of other useful information such as classification of agroforestry systems, ecological analysis of their spread, and salient aspects of some agroforestry technology innovations.

Price: Dfl 300, US\$ 175, or £ 97.

Orders to: In USA and Canada: Kluwer Academic Publishers, 101 Philip Drive, Norwell, MA 02061, U.S.A.

Elsewhere: Kluwer Academic Publishers Group, P.O. Box 322, 3300 AH Dordrecht, the Netherlands.

The Changing Atmosphere: Implications for Global Security. Conference Proceedings. World Meteorological Organization/Environment Canada/United Nations Environmental Programme. WMO Publ. N°710. World Meteorological Organization, Geneva. 1989, 483 p. ISBN 92-63-00710-1. Texts in English and French.

In September 1987, the World Commission on Environment and Development (WCED) reported to the United Nations General Assembly that Earth's ability to support life is being seriously threatened by the influences of humanity. It indicated that the ecology and economics of human development 'are becoming ever more inter-woven - locally, regionally and globally - into a seamless network of causes and effects'. The Commission issued a call to 'people of all countries and all walks of life' to move quickly in restructuring national and international policies and institutions in order to foster the sustainability of social and economic development. Nowhere is the problem more evident than in the Earth's atmosphere. Increases in concentrations of greenhouse gases and reductions in the protective high-altitude ozone layer are altering its unique life-support characteristics, while acid rain and long range transport of air pollutants are affecting fragile eco-systems over large regions of the globe. These changes are unprecedented in human history and appear to be escalating in magnitude.

The present publication contains the proceedings of the World Conference on the Changing Atmosphere, which was held in Toronto, June 1988. The objectives of the conference were: (1) To increase international

awareness of, and ability to respond to, consequences of a changing atmosphere; (2) To develop strategies and actions to recognize and deal with human influences on the atmosphere that are socially and environmentally unacceptable; (3) To examine ways and means of developing an international agreement to stabilize and reduce the adverse human influences on the global atmosphere; and (4) To promote and increase global cooperation in programs that attempt to forecast change, reduce harmful emissions and adapt to or mitigate adverse effects.

The Conference was organized into three segments. During the first one and one half days, the background scenarios for subsequent working group discussions were provided through challenges presented by keynote speakers and expositions of the reasons for concern (including assessments of uncertainties and knowledge gaps) presented by spokespersons from the scientific community. During the second day, Conference participants gathered into thematic working groups to assess policy implications of the scenarios provided by the speakers. The final stage of the Conference was devoted to the drafting of a consensus Conference Statement and summary comments of an international panel of political leaders.

These proceedings include the invited presentations to the Conference and the results of its deliberations. The document is organized into four sections. The first presents the special addresses provided by the keynote and luncheon speakers. That is followed by all the theme papers. The third part includes the various conference documents and report which emerge, including the final statement, working group reports, a background document and a statement prepared by the non-governmental organizations. The final section consists of a series of appendices presenting other documents pertinent to the Conference, as well as a list of participants and of conference committees and their members.

Orders to: World Meteorological Organization, Case Postale 5, CH-1211 Geneva 20, Switzerland.

Nitrogen Efficiency in Agricultural Soils. D.S. Jenkinson and K.A. Smith, editors. Elsevier Applied Sciences, London and New York, 1988, ix + 450 p. ISBN 1-85166-240-5 (hardbound).

This book contains the papers presented at a Seminar held at the University of Edinburgh, in September 1987. The Seminar was organized on behalf of the Commission of the European Communities (CEC) as part of their 'Energy in Agriculture' Research Programme.

In the year 1985-86 the 12 countries of the CEC used 9.5 million tonnes of nitrogen fertilizer, worth some £3 billion at current prices. It is of economic and environmental importance that this fertilizer be used efficiently, not only to avoid wasting a valuable plant nutrient but also to make sure that as little as possible leaks into rivers and aquifers, where it is not wanted.

The aims of the Seminar were: (1) to bring together and consider current work on the efficiency of use of fertilizers in agriculture; (2) to examine the pathways by which nitrogen is lost from the crop/soil system; (3) to consider how the biological transformations undergone by nitrogen influence its behaviour in soil and its uptake by plants; and (4) to discuss current attempts to model the behaviour of fertilizer nitrogen in soil and to assess how best to use such models to minimize wastage of nitrogen.

Discussions groups were set up during the Seminar to consider the papers presented under these four headings; there is a synopsis of their reports at the end of this book.

Price: £ 49.00

Orders to: Elsevier Applied Science Publ. Crown House, Linton Road, Barking, Essex IG11 8JU, England; *or:* Elsevier Science Publ. Co., 52 Vanderbilt Avenue, New York NY 10017, U.S.A.

Quaternary and Environmental Research on East African Mountains. W.C. Mahaney, editor. A.A. Balkema, Rotterdam and Brookfield, 1989, xii + 483 p. ISBN 90-6191-794-8 (hardbound).

This volume is the culmination of over twenty years of environmental research on the East African Mountains by a group of specialists, working in different disciplines, but with common interests in the Quaternary. The scientific questions posed and ensuing discussions in twenty-six papers, form an impressive summary of research on glacial history, palaeoclimatology, biogeography, paleosol sequences and ecosystem disequilibrium.

An important aspect of this volume is its reflection of the growing interdependence of the above disciplines on one another. The volume begins with detailed discussions of the glacial records of Mount Kenya and Kilimanjaro, Ruwenzori and Siemen mountains. After establishing a firm geological foundation for the main mountain massifs, other discussions focus on detailed chrono-stratigraphic, glacial geologic, and vertebrate paleontologic problems. In order to understand the current structures of the Afroalpine and Afromontane biochoria, a number of authors discuss the general biological processes of evolution and dispersal, as well as the geological and paleoclimatological conditions under which these processes occurred.

Other papers give an overview of the biogeography and the integration of paleosol investigations with geomorphic, geologic, biogeographic and microbiologic fields. Advances in paleoclimatic reconstruction and its integration into the geologic/geochronologic/ecologic record, form an important component of this volume. It ends with several papers that deal with ecosystem dynamics.

Price: Dfl 135.

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.

Proceedings First International Symposium on Paddy Soil Fertility. Chiangmai, Thailand, 6-13 December 1988. Two volumes. Land Development Department, Bangkok, 1988, 1079 p.

This symposium was organized by the Paddy Soil Fertility Working Group, established during the 13th International Congress of Soil Science, Hamburg, 1986.

Over 65 papers were presented in the following sessions: overview of paddy soils, country reports, sustaining soil fertility in lowland rice systems, chemistry of paddy soils, fertility of paddy soils and fertilizers, and management of paddy soils.

Orders to: Dr. S. Panichapong, Secretary ISSS Working Group PS, c/o Land Development Department, Phaholyothin Road, Bangkok 10900, Thailand.

Soil Morphology, Genesis, and Classification. D.S. Fanning and M.C.B. Fanning. John Wiley & Sons, New York, Chichester, 1989, xx + 395 p. ISBN 0-471-89248-3.

This book is intended to be used as a textbook for an advanced undergraduate course in soil morphology, genesis, and classification, and also as a reference book on these subjects. It evolved from course notes that were developed over a period of 20 years of teaching an advanced undergraduate course at the University of Maryland.

Soil morphology is covered somewhat indirectly in the book. Certain sections are devoted to horizon nomenclature by the ABC system and to the diagnostic epipedons, horizons, pans, and other soil profile or pedon features of Soil Taxonomy, which are all based on soil morphology. Pictures and diagrams of some soil morphological features are included.

Specific sections on soil genesis are devoted to the processes of soil formation and change and to factors of soil formation. Processes are emphasized early in this book to present ways in which certain soil morphological features are thought to have come into existence and to set the stage, for the consideration of some main kinds of soils (e.g. Spodosols, and Mollisols) that have come to be recognized as distinctive by many soil scientists. The factors approach is introduced as a systematic way of thinking about and analyzing why one soil differs from another and for finding relationships between one soil and another.

The primary soil classification system used in this book is Soil Taxonomy; the other system is the older USDA system of 1938. The authors have included much information on acid sulphate soils, because these soils are not emphasized enough in most soil science books. A four-page section of colour plates is included.

Orders to: John Wiley & Sons, Baffins Lane, Chichester, West Sussex PO19 1UD, England; *or:* John Wiley & Sons, 605 Third Avenue, New York NY 10158-0012, U.S.A.

Salt-Affected Soils. I. Szabolcs. CRC Press, Boca Raton, 1989, 274 p. ISBN 0-8493-4818-8 (Hardbound).

The aim of this book is to make a state-of-the-art review of the whole problem of soil salinity, including the nature of this phenomenon and the extent of salt-affected soils in different parts of the world in relation to the environmental conditions under different climatic, geochemical, and pedological circumstances. It is also important to characterize the main areas where salt-affected soils appear and the physical and chemical properties that have a bearing on the possibilities for agricultural production, horticulture and silviculture, and on environmental problems.

It is also necessary to interpret the pedological characteristics of various types of salt-affected soils as well as their morphology, structure, physics, and chemistry. The processes that result in saline and alkali soils are very diverse, but they have one thing in common: they all develop due to the direct effect of water-soluble salts. This is a common occurrence, so there is a great need to describe and interpret the soil-forming processes leading to the development of different types of salt-affected soils. The physics and chemistry, and in part the physico-chemistry and geochemistry of such phenomena are widely described and discussed in the literature, but a comprehensive compilation is still needed. The same goes for the pedological and biological processes resulting in salt-affected soils, which have been given less attention than the chemistry, physico-chemistry, and even the hydrology of these formations. The elaboration of effective systems for the improvement and utilization of such soils is only possible in the possession of a thorough knowledge of these processes.

There are vast territories on all continents covered by different types of salt-affected soils, but besides those formed by natural, primary soil-forming processes, human activity (particularly irrigation), has also created large tracts of so-called secondary salt-affected soils. The extent of such soils is similar to that of soils which have been formed without human interference; however, the importance and hazard of this phenomenon are much greater. It is therefore vital to characterize man-made soil salinity and to outline, or in some cases to elaborate in detail the methods for combating it.

The author, who is Deputy Secretary-General of the ISSS, has succeeded to give a comprehensive compilation of aspects of soil salinity at a global scale; the importance of salt-affected soils and of possibilities for their study, utilization and improvement.

Price: £ 94.50.

Orders to: Wolfe Medical, 2-16 Torrington Place, London WC1E 7LT, England; In U.S.A.: CRC Press, 2000 Corporate Blvd., N.W., Boca Raton, FL 33431, U.S.A.

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Agricultural Compendium for Rural Development in the Tropics and Subtropics. Third edition. Produced and edited by Euroconsult. Elsevier, Amsterdam, Oxford, 1989, xxxvii + 740 p. ISBN 0-444-042905-0 (hardbound).

The main objective of the Compendium is to be helpful in identifying potentials of and constraints to agricultural development and in formulating measures to promote such development. The process of developing rural areas involves a large number of factors. Promotion and control of this process require an integrated approach, with attention to all aspects that play a significant part, so as to reduce the hazard that limiting factors will crop up one after another, and ultimately cause the process to stagnate. In view of its multidisciplinary character, an integrated approach may well give rise to difficulties such as: (1) assessment of the disciplines, experts and information needed for the specific studies; (2) gaps in communication between various experts, especially in the overlap between disciplines; (3) the required despecialization of experts who have to act as generalists (a) when taking part in marginally staffed missions – for instance to identify development potentials by means of a broad reconnaissance – and therefore under the obligation to collect data essential not only to their own but also to other disciplines; (b) when confronted with information, already collected locally but classified according to methods unfamiliar to them or not suited to the purpose and consequently requiring interpretation, while communication with centres of basic information and advice is impossible; and/or (c) when assigned to organize and to lead multidisciplinary studies.

In order to alleviate these difficulties the Compendium aims at providing: (1) general information about various disciplines; and (2) an aid to memory to the development worker, especially to the generalist in the field who has no opportunity of brief consultation.

A practical consequence of these objectives is that specialists will find little new information in their own field. However, the Compendium may well be useful in, i.e., making integrated studies resulting in a limited number of well-considered development alternatives as a basis for sound decision-making.

The main challenge in compiling a compendium of such a general nature has been to prevent it from expanding into another textbook or into an encyclopedia. For this purpose a number of restrictions have been observed: (1) the reader is presumed to have completed a college or university training; (2) the information in the Compendium has been attuned primarily to studies of a high level of generalization, from broad reconnaissances to feasibility appraisals, and to field work in order to serve especially the man on the spot; and (3) the objective of the Compendium has not been to cover in the first instance all subjects concerned with the development of rural areas. For instance, forestry and horticulture as such have not been treated. Although briefly discussed in the section on land classification, the integrated survey, its techniques and requirements, can be more properly treated in a textbook than in a compendium.

Like its predecessors, this revised edition is a very useful field guide and reference work. The lay-out is systematic, the index enables the large amount of information to be searched quickly.

Price: US\$ 65.75 or Dfl 125.00; discount with 5 or more copies.

Orders to: In North America: Elsevier Science Publ. Comp., P.O. Box 882, Madison Square Station, New York NY 10159, U.S.A. *Elsewhere:* Elsevier Science Publ., P.O. Box 211, 1000 AE Amsterdam, the Netherlands.

World Rice Statistics. International Rice Research Institute, Los Baños, 1988, 257 p. (Paperback)

This publication draws together statistics on rice production, trade, consumption, prices, and related basic information from various international and national sources. FAO publications are used as sources of data on production, area, yield, and trade of rice. Tables on rice trade include origin and destination, tariff and nontariff measures on rice, and carry-over stocks of rice.

Price: US\$ 13.50 developed countries, \$ 3.50 for developing countries, plus \$ 7.00 for airmail or \$ 2.00 for surface mail when ordered from IRRI.

Orders to: Div.H., Communications and Publications Dept., IRRI, P.O. Box 933, 1099 Manila, Philippines; Agribookstore, Winrock, 1611 North Kent Street, Arlington, VA 22209, U.S.A.; or: TRIOPS, Hindenburgstrasse 33, D-6100 Darmstadt, Fed.Rep. of Germany.

Plant Nutrition. An Introduction to Current Concepts. A.D.M. Glass. Jones and Bartlett Publ., Boston and Portola Valley, 1989, vi + 234 p. ISBN 0-86720-080-4. (hardbound).

Plant mineral nutrition is a subject of enormous scope. At the level of applied plant biology it is of critical importance in agriculture and forestry. The successful cultivation of many of our crops now depends upon increasingly sophisticated technologies and an intimate knowledge of plant physiology, particularly plant mineral nutrition.

At the same time plant mineral nutrition has a long history as a fundamental academic component of plant physiology and soil science programs; it is also essential for a proper understanding of plant ecology. Plant mineral nutrition currently draws from and interacts with developments in membrane biochemistry, biophysics and with cell physiology.

This book is designed as an introduction to plant mineral nutrition, suitable for undergraduate students in botany, biology, soil science or agriculture as well as for graduate students and researchers.

Orders to: Jones and Bartlett Publ., 20 Park Plaza, Boston, MA 02116, U.S.A.

Geomorphology in Environmental Planning. J.M. Hooke, editor. John Wiley & Sons, Chichester, New York, 1988, xiv + 274 p. ISBN 0-471-91988-8 (Hardbound).

Geomorphologists are concerned with the form and processes of the earth's surface so any activity which modifies the shape of the land, induces movement of materials or alters the quantity or quality of water and drainage, is of interest to them.

This book examines the interaction between geomorphology and public policies. The concern is with policy areas which affect the physical landscape and the processes acting within it. It focuses not only on the impact of present policies but also on identification of policy needs and on the design and implementation of policies. The nature of environmental problems in affecting everyone means that most such policies are discussed, formulated and implemented largely within the public domain, though the response of individuals may have a profound effect on the resulting situation.

Effective interaction between geomorphology and public policies requires an awareness on the part of planners and policy-makers of the expertise offered by geomorphologists and an awareness by geomorphologists of the policy frameworks, decision-makers and processes of policy-formulation. Details on each of these aspects are provided in this book and the advantages of this mutual awareness are demonstrated clearly. Strategies for involvement are suggested though the difficulties are also indicated. Policy voids and data needs are identified.

The papers included here were amongst those presented at a symposium held at Portsmouth in January 1987. In each major geomorphological or policy sphere a review is provided by a leading authority and this is followed by a case study of a specific application or problem. It encompasses issues in rural and urban areas and dynamic zones such as rivers and coasts. The papers focus on policy in the United Kingdom but draw on experience elsewhere.

Price: £ 38.40.

Orders to: John Wiley & Sons, Baffins Lane, Chichester, West Sussex PO19 1UD, England; or: John Wiley & Sons, 605 Third Avenue, New York NY 10158-0012, U.S.A.

Soil Physics. Second edition. T.J. Marshall and J.W. Holmes. Cambridge University Press, Cambridge, New York, 1988, xii + 374 p. ISBN 0-521-35270-3 (hardbound); 0-521-35817-5 (paperback).

This book gives an account of how water influences the physical properties of soils, such as stability of structure and ease of tillage; how plants absorb water from soils; how water enters the soil and flows through it to contribute to stream flow; how soluble salts are transported; and how the evaporation rate from the land surface is influenced by soil water supply, the nature of the plant cover and the evaporative power of the atmosphere.

Since the first edition in 1979, there have been many advances in all aspects of soil and water science covered by this book. Much of the updating that has been necessary is in chapters that bear on field aspects of the subject, where there has been much activity in research.

Orders to: Cambridge University Press, The Pitt Bldg., Trumpington Street, Cambridge CB2 1RP, England; or: Cambridge University Press, 32 East 57th Street, New York, NY 10022, U.S.A.

Persistence in Forage Legumes. G.C. Marten, A.G. Matches et al., editors. American Society of Agronomy, Crop Science Society of America and Soil Science Society of America, Madison, 1989, xxiv + 572 p. ISBN 0-89118-098-2.

Forage legumes are unique among crop plants. They contribute essential soil N, by fixing it from the air, for their own growth and associated or succeeding grasses and other crops. They also supply high-quality herbage for grazing or conserved feeding or ruminant livestock that helps ensure an economical and healthful supply of dairy products, meat, and animal fiber nationally and internationally. Further, forage legumes provide a more continuous supply of feed throughout the growing year than is possible with grasses alone. In addition, forage legumes aid in prevention of soil erosion by provision of year-round ground cover, and lessen contamination of ground-water, especially by nitrates.

The present book is the proceedings of a workshop held in Hawaii in July 1988. The purpose of the workshop was to discuss the problem of poor persistence of forage legumes and to define research priorities for its solution.

The objectives of the workshop were to: (1) document problems of poor forage legume persistence in each country and their economic consequences, (2) review what is known of constraints to forage legume persistence in each country, (3) exchange information on concepts, methods, approaches, and recent advances regarding forage legume persistence, (4) compile, interpret, and document pertinent data on persistence of forage legumes, (5) develop a consensus on important gaps in biological information needed to allow modelling of forage legume persistence, and (6) enable scientists in Australia, New Zealand and the United States who are conducting research on forage legume persistence to meet and exchange information.

The proceedings contain an executive summary and recommendations for collaborative research projects or exchanges among scientists from the three countries. The publication also covers: overview of problems with legumes, development and growth characteristics of legumes, major edaphic and climatic stresses, cultural practices and plant competition, plant-animal interface, major pests and diseases, genetics and breeding for persistence, and areas of collaborative work.

Price: US\$ 19.00, plus \$ 1.90 per book for all orders outside the U.S.A.

Orders to: see next page.

Corn and Corn Improvement. Third edition. Agronomy N°18. G.F. Sprague and J.W. Dudley, editors. American Society of Agronomy, Crop Science Society of America and Soil Science Society of America, Madison, 1988, xix + 986 p. ISBN 0-89118-099-0. (Hardbound).

Yields have continued to increase at a fairly constant rate conditioned by a combination of improved hybrids, parental materials, and improved breeding techniques; more efficient use of fertilizers; more selective chemicals for weed, insect, and disease control; and improved machinery permitting greater timeliness of all field operations. Changing production practices have brought with them changing problems relative to the incidence of both old and new disease and insect pests and of weed control.

Genetic engineering was not recognized as having important production or breeding potential when the second edition was prepared. Since then there has been an explosive development in this broad areas. Great advances have been made in understanding basic principles involved in different aspects of genetic control and regulatory mechanisms. Chapters have been added on cell tissue culture and *in vivo* manipulations and on molecular genetics of corn which survey the current state of knowledge in these areas. The knowledge relative to genetic control of important physiological processes is reviewed in a new chapter on the use of physiological traits in corn improvement.

This volume was prepared to provide an authoritative overview for research workers, graduate or undergraduate students, and others interested in some aspect of breeding, production, or use. Illustrations and extensive literature citations should enhance this objective.

Price: US\$ 66.00, plus 6.60 per book for 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, U.S.A.

Soil Test Calibration in West Asia and North Africa. Proceedings of the Second Regional Workshop, Ankara, Turkey, 1-6 September 1987. A. Matar, P.N. Soltanpour and A. Chouinard, editors.

Currently, many farmers in the ICARDA region (West Asia and North Africa) use N and P fertilizers but have little information on which to base their decisions on how much to apply. The result is that many of the soils receive more fertilizer than can be used by the crop, and the unused portion is either lost or accumulated in the soil. For example, in some soils that have been fertilized yearly at rates recommended by agricultural industries, the available phosphorus has risen to about two or three times the amount needed for maximal yields of wheat. Bringing the application rates more in line with crop requirements could save hundreds of thousands of tonnes of fertilizers each year.

The International Center for Agricultural Research in the Dry Areas (ICARDA) is currently cooperating with countries in West Asia and North Africa that wish to improve the criteria they use for recommendations on fertilization with nitrogen and phosphorus. At present, six countries are participating in the network and have been undertaking fertilizer trials for use in the calibration of soil tests. The aim is to accumulate data on crop responses to fertilizer in dry areas on as many different agricultural soils as possible to provide reliable information on which to base recommendations to farmers on the correct rates of N and P that would adequately supply the nutrients needed by specific crops for economically optimal yields.

The network has been in place for 2 years, and a regional workshop brought together participants from 12 countries to discuss the results of research based on a common experiment design. Participants reported on their findings mainly those relating to correlations between NaHCO_3 -extractable P in the soil and responses by barley and wheat to applications of fertilizer.

Requests to: ICARDA, Box 5466, Aleppo, Syria.

Soil Improvement Techniques and their Evolution. W.F. van Impe. A.A. Balkema, Rotterdam and Brookfield, 1989, vi + 125 p. ISBN 90-6191-805-7 (hardbound).

Soil improvement is probably the oldest but, from a technical point of view, still the most intriguing technique of all common execution methods in civil engineering. More than 3000 years ago, soil improvement was already in use for the construction of the Babylonian temples. In this period too, the Chinese used wood, bamboo or straw to reinforce the soil.

For the present, our attention is particularly drawn to soil improvement by the use of, for example, explosives or impact energy, thermal treatment of the soil, or increasingly ingenious grouting materials and grouting systems. It is no exaggeration to say that throughout the world soil improvement techniques are of growing importance in the solution of more and more complicated foundation problems. In this report on 'state-of-the-art' soil improvement techniques, the following groups are distinguished: (1) Temporary soil improvement techniques: limited to the period of construction; (2) Permanent soil improvement: techniques are applied to improve the natural soil itself without the addition of materials; and (3) Permanent soil improvement with the addition of materials. In each of these three groups, a classification of the soil improvement techniques is also made, taking into account whether the soil layer to be improved is cohesive or not.

Price: Dfl. 70.00

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.

Geomechanics in Tropical Soils. Publications Committee of 2 ICOTS, editors, A.A. Balkema, Rotterdam and Brookfield, 1988 (vol.1, xi + 444 p.) and 1989 (vol.2, publ. in Nov.1989). (hardbound). ISBN vol.1: 90-6191-817-0, vol.2: 90-6191-818-9, set of 2 volumes: 90-6191-816-2.

The Technical Committee on Tropical and Residual Soils (TC25) was set up in 1985 by the International Society for Soil Mechanics and Foundation Engineering. One task of this committee was to organise and international conference on tropical soils in 1988 or 1989, following the one that was held in Brazil in 1985.

The Second Conference on Tropical Soil (2ICOTS) was held in Singapore in December 1988. The main purpose of the conference was to review the progress that has been made since 1985 with respect to the geotechnical properties and classification of tropical and residual soils, soil exploration and testing, stability of slopes and excavations, use of tropical soils as construction material for e.g. roads, airfields and earth dams and as foundation for different types of structures.

The response to the invitation for papers to the conference showed that there is a need for a conference entirely devoted to the special problems connected with tropical soils which affect almost all construction activities in many countries.

Problems with tropical and residual soils are often connected with the high annual rainfall in many countries in the tropics and the effect of the water on e.g. the erosion and the stability of slopes and the control of the water content during compaction. Of special interests are the effects of the negative pore water pressure and the cementation on the strength of residual soils and of weathered rocks, and the importance of the soil structure on the permeability and the drainage. Of interest are also the possible relationships between the Atterberg limits and the shear strength and compressibility of tropical and residual soils. Commonly used relationships are not applicable.

The papers presented at the conference will be published in two volumes, Volume 1 before the conference with all the papers and Volume 2 after the conference with the special lectures, general reports and discussions. The present volume contains papers on: characterization, identification and classification of tropical soils (12 papers); engineering properties of tropical soils (19 papers); stability of slopes and excavations in tropical soils (9 papers); foundations of buildings in tropical soils (5 papers); and construction of dams, roads, airfields, harbours, land reclamation in or on tropical soils.

Price: 2 volume set Dfl. 195.00

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.

Research Procedure and Experimental Design for Savanna Ecology and Management. B.H. Walker and J.C. Menaut, editors. International Union of Biological Sciences (IUBS) and the Unesco Man and the Biosphere Programme, 1988, 119 p. ISBN 0-643-04811-1.

This is the first publication in the series 'Responses of Savannas to Stress and Disturbance' (RSSD) and is the report of a meeting of an IUBS Working Group Decade of the Tropics Programme on Tropical Savanna Ecosystems, held in June 1986, and finalized at a meeting in October 1987.

RSSD is a collaborative programme made up of researchers who have similar goals relating to an understanding of how tropical savannas work and how they respond to being used and abused by man. The programme does not pretend to have any overriding authority and its only requirements for participation are that (1) projects are concerned with natural vegetation (i.e. areas which are not, and have not been, cultivated) and (2) they relate to the objective of the programme as defined below. What follows are suggested guidelines which should allow for the achievement of the programme's objectives, through the pooling of ideas and data and through the combined wisdom of like-minded scientists.

The objective of the programme has been determined as follows: 'To develop a predictive understanding of the ways in which savannas respond to natural and man-made stresses and disturbances'. The programme has four main components: (1) Improvement of communication and interaction among savanna ecologists, as well as between ongoing research programmes; (2) Promotion of short term collaborative projects aimed at solving individual key questions; (3) Organization and execution of intercontinental, comparative experiments on the responses of savanna ecosystems to stress; and (4) Incorporation of research results into the management of savannas.

The aim is to compare the responses of different savannas to similar types and degrees of disturbance or stress using, wherever possible, experimental techniques. The RSSD programme therefore provides a framework of hypotheses, guidelines, and methods aimed at promoting various comparative, cooperative experiments. It is not intended to have one grand experiment, but rather a series of experiments which will be conducted as opportunities allow. The RSSD programme will serve as a focus for savanna research, a facilitator of inter-group communication, and promoter of comparative experiments throughout the Decade of the Tropics.

Twenty hypothesis have been suggested so far. They are based on what is already suspected or known about savanna ecosystems. The objectives of the meetings in 1986/7 were to (1) Develop the hypotheses into specific and detailed research proposals; (2) Develop the framework for a functional classification of savannas and savanna plants; and (3) Develop guidelines and procedures for extending the results of research to savanna management and planning.

Requests to: Dr. H. Walker, CSIRO, P.O. Box 84, Lyneham ACT 2602, Australia.

Biotechnologies and Development. A. Sasson. Unesco and Technical Centre for Agricultural and Rural Co-operation (CTA), 1988, 361 p. ISBN 92-3-102426-4.

Are biotechnologies going to be a panacea for the various problems the developing countries are facing, or will they merely add to the disparities which exist between these countries and the industrialized technologically advanced world?

The value of biotechnologies is that they can be applied – at different levels of complexity, and of investment and effort – in the production of food crops, livestock husbandry, the chemical and pharmaceutical industries, the conversion of biomass into energy and fuel, the transformation of agricultural and industrial by-products, and pollution control.

But the expansion of biotechnologies is occurring in the context of powerful economic interests. Many developing countries run the risk of becoming far more technologically dependent as a result, though they can still design policies which will enable them to take advantage of biotechnologies according to their needs and specific situations.

Co-operation at the subregional, regional and international levels, helps to stimulate research, to train experts and promote contacts between theme, to disseminate specialized knowledge, and to adapt biotechnologies to different social and economic settings.

This book sets out to inform a wide readership of those interested in the potential and the promise of biotechnologies for developing countries. It also describes the difficulties and the constraints that these countries face in selecting, acquiring and adapting biotechnologies for their own use.

Price: FF 148, US\$ 34 or £ 23.

Orders to: Unesco sales agents throughout the world or, in case of difficulties, Unesco Press, Unesco, 7 place de Fontenoy, F-75700 Paris, France.

Coastal Lowlands Geology and Geotechnology. W.J.M. van der Linden, S.A.P.L. Cloetingh et al., editors. Kluwer Academic Publishers, Dordrecht, Boston, 1989, viii + 370 p. ISBN 0-7923-0081-5.

Coastal lowlands by virtue of their position across the boundary of land and sea belong to the earth's most dynamic systems. This is true in the physical, i.e. geological and biological, as much as in the cultural and social sense. Although the nearness to the sea was and still is fraught with danger coastal lowlands have always attracted human interest, providing challenging opportunity, holding the promise of profitable enterprise. Coastal lowlands, especially where rivers enter the region, are the cradles of great civilisations and there, of old, populations reached highest densities. As an example, Dutch history is a tale of human struggle and endeavour with and against the sea. Dutch 'lowlanders' wrestled their land from the sea, in turn the sea forged a nation of independent fishermen, navigators, farmers and traders who built their town and ships at the borders of the North and Zuyder Seas.

As lowlands subside and sea level rises, apparently these days at an increasing rate, concern about this environment world-wide is also rising. It certainly was appropriate and timely for the Royal Geological and Mining Society of the Netherlands when celebrating its 75th birthday to organize and call together a symposium, focusing attention on the geology and geotechnology of coastal lowlands at a global scale, geology to better understand their formation and evolution, geotechnology to better manage and harvest resources as much as protect a unique and crucial environment.

Price: US\$ 127 or Dfl 220.

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

African Agricultural Research and Technological Development. Proceedings of a High-Level Meeting in Feldafing, Fed.Rep. of Germany, September 1987. D.C. Pickering, editor. The World Bank, Washington, 1988, xv + 207 p. ISBN 0-8213-1073-9.

Agricultural research is vital to the economic recovery, long-term progress, and future prosperity of Sub-Saharan Africa. An extensive network of regional and international research institutions can now generate new agricultural technology for the region. But few national systems are currently strong enough to adapt this technology to the needs of their local farmers.

To strengthen agricultural research in Africa, a World Bank strategy was drafted as a framework for future national and regional research plans. These proceedings review that strategy.

Among the points of strategy discussed at the meeting were: (1) The responsibility of the African governments to plan their own national research strategies; (2) The strengthening of collaborative regional research networks dealing with key commodities and farming systems; (3) A greater understanding of the individual farmers – many of whom are women – to be assisted by new technologies; and (4) A significantly greater involvement of the African university community.

Participants at the meeting included senior officials from relevant government agencies in a number of African countries; regional, bilateral, and multilateral development organizations; and a number of African universities.

Price: US\$ 12.00

Orders to: Distributors of World Bank Publications around the world, or, in case of difficulties: The World Bank, Publications Dept. J2190, 1818 H Street N.W., Washington DC 20433, U.S.A.

Future Developments in Soil Science Research. A Collection of Soil Science Society of America Golden Anniversary contributions presented at the annual meeting in New Orleans, LA, 30 Nov.-5 Dec. 1986. L.L. Boersma et al., Soil Science Society of America, Madison, 1987, xvi + 537 p. ISBN 0-89118-786-3.

During the past 50 years, we have obtained a better understanding of the complexity of the physics, chemistry, and microbiology of soil systems. Now, during this time of rapid changes in science, standing at the threshold of the next 50 years in the life of the Soil Science Society of America, the important research needs for the future are considered. Meeting speakers were asked to address future development in soil science research at the Golden Anniversary meeting. This publication is a record of these presentations.

It is clear that the future is forcing itself upon us with dramatic impact. The business of soil science is changing at a rapid rate. Experimental developments and equipment provide much of the impetus of renewed study of old problems. New insights are gained. The use of mathematical models, in particular, is forcing many changes.

Soil science is now less discipline oriented than in the past. Fifty years ago, divisional groupings were clear and soil science was clearly the domain of soil scientists. Now divisional separations are more diffused, but at the same time, scientists from other disciplines enter the arena where soil scientists have functioned in the past.

The present publication contains contributions on future developments in soil physics, soil chemistry, soil microbiology and biochemistry, soil fertility and plant nutrition, soil genesis, morphology and classification, soil and water conservation and management, forest and range soils, fertilizer technology and use, and on soil mineralogy.

Price: 1-10 copies US\$ 10 each, plus 10 percent on orders outside U.S.A. Advance payment required.

Orders to: ASA, CSSA, SSSA Headquarters Office, Attn. Book Order Dept., 677 South Segoe Road, Madison, WI 53711, U.S.A.

Light Microscopy in Biology. A Practical Approach. A.J. Lacey, editor. IRL Press at Oxford University Press, Oxford, New York, 1989, xviii + 329 p. ISBN 0-19-963036-4 (hardbound); 0-19-963037-2 (paperback).

The aim of this book is to give guidance at the practical level to people who wish to make more extensive use of their microscopes and also to offer encouragement to those attempting, perhaps for the first time, to visualize specimens and record their observations at the microscopic level.

One purpose of a microscope is to enable the observer to see or to record the fine detail of a specimen. It is also possible, however, to use the microscope to make measurements of the specimen. Another more recent development has been a technique for indicating the interaction of light and matter with the intention of determining such parameters as the refractive index, mass and chemistry of small objects. By repeated recordings or measurements over time, movements or other changes can be detected and studied.

Light microscopes have been in use for more than 200 years but techniques change as demands alter. Technological advances in both hardware and software also stimulate new investigations; automative image recording processing and analyses are perhaps the latest of these developments.

The book starts with an explanation of the basic techniques and goes on to describe: recording images produced by illumination techniques; immunohistochemistry; histochemistry; fluorescence microscopy; micrometry and image analysis; combining microscope techniques in chromosome studies; and video microscopy and the equipment required. Throughout the book, emphasis is placed on the critical approach that must be made when interpreting results in microscopy.

Although written to provide biomedical laboratories personnel with a working manual of techniques in modern light microscopy, the text is also of interest to researchers in other disciplines to make more extensive use of this flexible technique in their work.

Price: £ 19.00

Orders to: Oxford University Press, Saxon Way West, Corby NN18 9ES, England.

Reactions and Movement of Organic Chemicals in Soils. SSSA Special Publication 22. B.L. Sawhney and K. Brown, editors. Soil Science Society of America, American Society of Agronomy, Madison, 1989, xvii + 474 p. ISBN 0-89118-788-X.

Today ground-water contamination with chemicals from agriculture as well as municipal and industrial wastes is a major concern throughout the world. Understanding the reactions and movement of these organic chemicals throughout the soil is quite complex due to the diverse chemical characteristics of the compounds. The numerous physical, chemical, and biological characteristics of soils help to further complicate the problem.

This publication presents the state-of-the-art knowledge on physical, chemical, and biological interactions of industrial and agricultural chemicals in soils and their mechanisms. These interactions are dealt with under various categories including sorption/desorption, volatilization, photolysis and biodegradation, and their kinetics. Models developed to predict the fate and transport of contaminants as they pass over and through soil are included. In addition, case histories of ground-water contaminated with organic compounds at landfill and hazardous waste disposal sites are described.

Price: US\$ 42.00, plus \$ 4.20 per book on all orders outside the U.S.A.

Orders to: ASA/SSSA Headquarters Office, Attn. Book Order Dept., 677 South Segoe Road, Madison WI 53711, U.S.A.

Carte de la Végétation Naturelle des Etats membres des Communautés Européennes et du Conseil de l'Europe. 1:3.000.000è. Deuxième édition. Texte explicatif par A. Noirfalise. Commission des Communautés européennes et Conseil de l'Europe. Office des Publications Officielles des Communautés européennes, Luxembourg, 1987, texte explicatif (78 p.) + carte pliée, sous pochette ISBN 92-825-7266-8; texte explicatif + carte en rouleau ISBN 92-825-7352-4.

Depuis la publication en 1979 d'une première carte de la végétation naturelle potentielle, d'importants progrès ont été accomplis dans l'étude des végétations et la coopération scientifique entre spécialistes européens. Dès lors, une nouvelle édition de cette carte paraissait opportune et le Comité européen pour la sauvegarde de la nature et des ressources naturelles du Conseil de l'Europe en recommanda la mise en chantier dès 1980.

Un groupe d'experts ad hoc fut convoqué en décembre 1983 pour définir les critères du projet. Il fut décidé que la carte serait publiée à l'échelle du 1/3.000.000 et qu'elle devrait exprimer la composition et la répartition des végétations naturelles édaphiques et climatiques, existantes ou potentielles. L'objectif assigné était de produire un document exprimant l'identité, la structure et la diversité écologiques de l'Europe, de ses écosystèmes naturels et des potentialités phytocénotiques, comme une des bases d'une politique de conservation et de gestion rationnelle de l'environnement, de ses ressources et de sa vie sauvage.

Les unités de la carte délimitent des territoires écologiques relativement homogènes, caractérisés par la prédominance d'une végétation primaire naturelle ou subnaturelle, dont il subsiste des exemplaires sur le terrain. Le plus souvent, celle-ci a été remplacée au fil des siècles par des végétations secondaires, semi-naturelles ou artificielles aujourd'hui dominantes.

A priori, on a distingué les végétations dites édaphiques ou azonales (classe I avec 9 sous-classes), liées à des contraintes spécifiques du sol, et les végétations dites zonales ou climatiques, qui expriment le potentiel édapho-climatique sur les substrats qui échappent à ces contraintes (sols zonaux). (classe II avec 5 sous-classes; classe III avec 7 sous-classes; classe IV avec 3 sous-classes; classe V avec 5 sous-classes; et classe VI avec 2 sous-classes).

A l'échelle de la carte, il est évident que la plupart des unités comportent une certaine diversité édaphique, particulièrement dans les bassins mézoïques et tertiaires. Dans ce cas, elles comprennent aussi des formations naturelles ou semi-naturelles satellites, qui sont brièvement évoquées dans le texte explicatif.

Le climat est évoqué par la moyenne de janvier, la moyenne de juillet, les précipitations annuelles et, occasionnellement, l'évapotranspiration potentielle annuelle. Les types de sols font référence à la classification FAO/Unesco, utilisée dans la carte des sols 1/1.000.000 de la Communauté européenne (1985).

Prix: ECU 40,30; BFr 1750; FF 280 à Luxembourg.

Commandes à: ILH Geocenter, Postfach 800830, D-7000 Stuttgart 80, Rép.Féd. d'Allemagne.

Tropical Forests. Botanical Dynamics, Speciation and Diversity. L.B. Holm-Nielsen, I.C. Nielsen and H. Balslev, editors. Academic Press, 1989. xv + 380 p. ISBN 0-12-353550-6.

The increasing rate of destruction of the world's tropical forests gives grave cause for concern on several counts. In conservation terms, species are being lost at an incredible rate, many before they have even been described. In scientific terms, habitats, communities and unique systems are lost before they can be studied and used to broaden our understanding of ecological processes in general.

A symposium to address botanical dynamics, speciation and diversity in tropical forests was held in Aarhus, Denmark, in August 1988. The meeting upon which this book is based was therefore aimed at addressing two basic needs: firstly to describe some of the marvellous biological treasures of tropical forests and to learn what they can tell us about processes in ecology; and secondly to alert us all once again to the disaster which is overtaking this rich and varied environment.

The section on forest dynamics discusses both the physical features, such as soil, landscape and water, and the patterns of tree distribution in the forest. The sections on diversity and speciation are largely written by systematists, from which many ecological and theoretical aspects are emerging.

Orders to: Academic Press, 24-28 Oval Road, London NW1 7DX, England; *or:* Academic Press, San Diego, CA 92101, U.S.A.

World Regional Requirements. Plant Nutrient Sulphur. Trade, Promotion, Marketing. The Sulphur Institute, Washington, 1987, v + 170 p.

The papers reproduced in this book were presented during a session devoted to plant-nutrient sulphur requirements and markets, at the Sulphur 87 international conference, which was held in Houston, in April, 1987.

The papers discussed in the first half of the session set out estimates of the requirements of the main regions of the world for plant-nutrient sulphur. The remainder of the papers were concerned with the promotion and marketing of plant-nutrient sulphur in these same regions.

Requests to: The Sulphur Institute, 1725 K Street, N.W., Washington DC 20006, U.S.A.; *or:* The British Sulphur Corporation, Parnell House, 25 Wilton Road, London, SW1V 1NH, England.

Multilingual Dictionary of Forest Humus Terms. Z. Prusinkiewicz, Państwowe Wydawnictwo Naukowe, Warszawa, 1988, 195 p. ISBN 83-01-07582-1.

The terminology in the field of forests humus is among the most confused in world pedology. This is partly due to the fact that forest pedology has developed independently in different countries forming distinct national schools. In some countries (particularly of Central and North Europe) the terminology is very rich and more or less stabilized, in others, experts are content with only a few terms, and often individual authors in the same country use their own nomenclature and definitions. This state of affairs is a great impediment to international cooperation in research on forest humus.

The present multilingual dictionary with 126 entries facilitates translation of scientific texts and discussion at international meetings, brings closer together opinions regarding the characterization of soil organic matter, the systematics of forest humus and standardization of research methods, and makes possible comparative linguistic studies and the development of own terminologies in countries which have not them so far.

The author worked out the basic principles of the Dictionary and a list of entries and definitions based on Polish terminology. Full definitions are given in English, French, German, Russian, Spanish and Swedish, as well as in Polish. In seven other East European languages only the equivalents of the entries are given.

Requests to: Prof. Z. Prusinkiewicz, Dept. of Soil Science, M. Copernicus University, ul. Sienkiewicza 30, 87-100 Toruń, Poland.

Soil Processes. A systematic Approach. S. Ross, Routledge, London, 1989, xi + 444 p. ISBN 0-415-00205-2.

The idea behind this text is to introduce, in a systematic way, the fundamental processes of soil development and behaviour, together with the processes associated with, or altered by, man's use of soil. The text is intended for advanced undergraduate courses dealing with soil science, environmental science, agriculture or geography, and as a sourcebook for postgraduate researchers. An introductory knowledge of soil science and chemistry is assumed. While many introductory soil courses are typically descriptive, examining soil profiles and the spatial distribution of soil types, research in soil science tends to focus either on understanding the dynamics of *in situ* soil processes, or to examine the applied aspects of man's use of soil. This text is designed to provide a bridge between these extremes of the soil science spectrum, by looking at genetic soil processes (soil formation and profile development), at chemical and biological soil processes (solute dynamics and the biology of the rooting zone), and processes influenced by soil management practices (cultivation, fertilizing or the application of pesticides). These subjects are dealt with as a progressive sequence of increasing complexity, since soils become more complex through time and with profile development.

One objective of this text is an attempt to disaggregate soil formative and dynamic processes and then to examine their response to external influences. It is clearly important to consider the timescales over which individual soil processes operate, ranging from 'instantaneous', or near instantaneous reactions such as cation exchange, to annual cycles such as agrochemical solute dynamics, and even the longer timescales associated with profile development processes. It is equally essential to consider the interaction of processes which operate at these different timescales.

No attempt is made to deal with world soil processes: the approach is almost exclusively temperate. Throughout the text examples are drawn from a wide range of background subject matter, from geochemistry to microbiology, and from water chemistry to agriculture and forestry.

Price: £ 75.00.

Orders to: Routledge, 11 New Fetter Lane, London EC4P 4EE, England; *or:* Routledge, 29 West 35th Street, New York NY 10001, U.S.A.

Rock and Mineral Analysis. Reprint of second edition. W.M. Johnson and J.A. Maxwell. Robert Krieger Publ.Comp., Malabar, 1989, ix + 489 p. ISBN 0-89464-341-X (hardbound).

The original edition was published in 1981 by John Wiley & Sons, and is out-of-print.

This book is intended to be a laboratory reference book which will provide the practising analyst with an up-to-date treatment of the problems associated with the analysis of geological materials.

The preliminary considerations associated with the analysis of rocks and minerals, such as equipment, reagents, standard reference materials sampling theory, sample preparation, and sample decomposition, are covered in Part I, including, as Appendix I, a compilation and discussion of data on international standard reference materials.

Part II describes analytical methods for the determination of those commonly requested analyses that require individual methods of preparation or detection, such as carbon, sulphur, ferrous iron, moisture, and fluorine. Parts II and IV are devoted to the determination of major, minor, and trace elements in rocks and minerals by AAS and XRF methods. Each is divided into a section on general considerations, followed by a statement, on an element by element basis, of the analytical guidelines. A final section, Part V, presents a less detailed description of the application of emission spectrographic, neutron activation, fire assay, and electron microprobe analysis.

Price: US\$ 89.50.

Orders to: Robert E. Krieger Publ.Comp., P.O. Box 9542, Melbourne, FL 32902-9542, U.S.A.

Discharge Measurement Structures. Third revised edition. ILRI Publ.20. M.G. Bos, editor. International Institute for Land Reclamation and Improvement, Wageningen, 1989, 401 p. ISBN 90-70754-15-0 (hard-back).

This book presents instructions, standards, and procedures for the selection, design, and use of structures, which measure or regulate the flow rate in open channels. It is intended to serve as a guide to good practice for engineers concerned with the design and operation of such structures, and the book will serve this purpose in three ways: (i) by giving the hydraulic theory related to discharge measurement structures; (ii) by indicating the major demands made upon the structures; and (iii) by providing specialized and technical knowledge on the more common types of structures now being used throughout the world.

The text is addressed to the designer and operator of the structure and gives the hydraulic dimensions of the structure. Construction methods are only given if they influence the hydraulic performance of the structure. Otherwise, no methods of construction nor specifications of materials are given since they vary greatly from country to country and their selection will be influenced by such factors as the availability of materials, the quality of workmanship, and by the number of structures that need to be built.

The efficient management of water supplies, particularly in the arid regions of the world, is becoming more and more important as the demand for water grows even greater with the world's increasing population and as new sources of water become harder to find. Water resources are one of our most vital commodities and they must be conserved by reducing the amounts of water lost through inefficient management. An essential part of water conservation is the accurate measurement and regulation of discharges.

Price: US\$ 30.00 or Dfl 60.00

Orders to: ILRI, P.O. Box 45, 6700 AA Wageningen, the Netherlands.

Forest Site Evaluation and Long-Term Productivity. D.W. Cole and S.P. Gessel, editors. University of Washington Press, Seattle and London, 1989, viii + 196 p. ISBN 0-295-96683-1 (hardbound).

Much research has been done to understand the chemical, physical, and biological processes at work in forest sites, and much remains elusive. As analysis techniques become more sophisticated, some questions are answered and new ones arise. Some areas of the world most in need of such research do not have the benefit of earlier studies or experienced researchers to carry out current analyses. Many soil classification systems, developed mainly for agricultural use, are not appropriate for forest conditions.

The papers included here were prepared by scientists for a world congress of the International Union of Forestry Research Organizations (IUFRO) held in 1986. They deal with problems of site analysis and the effects of human activities on long-term productivity of forest lands. Contributions cover such issues as evaluation site, interlaboratory comparisons of chemical analyses, long-term growth effects of chemical fertilizers, influence of nitrogen fixation on soil acidification and nitrogen accumulation, potential effects of atmospheric deposition on productivity, and the reclamation of land by using municipal sewage sludge.

The volume will be of interest to practising foresters responsible for the management and stewardship of forest land as well as to researchers seeking to compare research goals and procedures.

Price: US\$ 40.00

Orders to: University of Washington Press, P.O. Box 50096, Seattle, WA 98145-5096, U.S.A.

Applied Geomorphological Mapping: Methodology by Example. C. Embleton, editor. Supplementband 68, Zeitschrift für Geomorphologie/Annals of Geomorphology. Gebr. Borntraeger, Berlin and Stuttgart, 1988, 239 p. ISBN 3-443-21068-6; ISSN 0044-2798.

Applied geomorphology can be defined as the application of geomorphological principles and techniques to the analysis and solution of geomorphological environmental problems. Over recent years, it has come to be focused on five main areas: (1) Earth sciences, thematic mapping and resource studies; (2) Environmental surveys and natural hazard studies; (3) Physical planning and development of rural areas; (4) Physical planning and development of urban areas; and (5) Engineering projects, including river and coastal engineering.

A central technique in geomorphology is geomorphological mapping, used both as a means of compiling a systematic inventory of landforms in a given area, and as a means of collecting data specific to a particular geomorphological problem. The possibilities of applying this technique in environmental planning and management are being increasingly appreciated.

Modern technology is allowing man to manipulate and interfere with the natural environment to an unprecedented degree. On a small scale, man can today control or change parts of the environment, for example in the management of water resources, the prevention of avalanches or the stabilisation of hill-slopes. Sometimes, however, man's interference with the complex environmental system has unintended and unfortunate results, largely through ignorance of the full effects of the changes that are being made, as in such well-known examples as soil erosion, subsidence or slope collapse. Applied geomorphology is concerned with both the planned and unplanned effects of man's utilisation of the land surface, and aims at bringing together the planner and the earth scientist.

The present publication contains a collection of papers that serves to stimulate interest in applications of geomorphological mapping and in improving the techniques of mapping.

Price: DM 138.00

Orders to: E. Schweizerbart'sche Verlagsbuchhandlung, Johannesstrasse 3A, D-7000 Stuttgart 1, F.R.G.

Land Husbandry. A Framework for Soil and Water Conservation. T.F. Shaxson et al. Soil and Water Conservation Society and World Association of Soil and Water Conservation, 1989, 64 p. ISBN 0-935734-20-1.

This publication provides an outline for incorporating resource-conserving practices into agricultural development schemes throughout the world. This handbook contains applicable guidelines for planning the best use of land resources on steep lands, new thoughts about the principles of land husbandry, and a step-by-step guide to practicing the principles outlined in the book.

The book emphasizes ways to design and implement development programs that for the first time work with, rather than against, farmers, thus improving the longevity and success of conservation measures. This new approach is based on three premises: encourage farmer and community involvement in all states of agricultural improvement, place more emphasis on the most erosion-prone land and maintain dense soil covers that maximize conditions for soil structure and organic activity, and arrange for safe disposal of flowing runoff without causing erosion damage.

Price: US\$ 12.00, incl. surface mail charges.

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

Loess in China. Second edition. Springer Series in Physical Environment, vol.5. T. Liu, Springer-Verlag, Berlin, Heidelberg, and China Ocean Press, Beijing, 1988, xx + 224 p. ISBN 3-540-16717-X. Hardcover.

The distribution, deposition, composition and texture of loess in China is studied. Based on on-the-spot investigations, this book supplies information on: the loess-paleosol time sequence, loess fabric, and geological events derived from studying biological relics.

Proceeding from the loess environmental system, the climatic fluctuation sequence of different scales has been reconstructed, and the whole process of eolian loess accumulation and its relationship with modern silt dust, water and soil conservation, engineering geology, agricultural soil as well as local diseases are discussed.

It has the following chapters: A brief history of loess studies in China; Regional distribution of the eolian products (loess); Time sequence of loess deposits; Fossils in loess and its ecological environment; Composition of loess; Loess and the environment; and Methods in loess research.

Price: DM 178.00

Orders to: see below

Balancing the Needs of Water Use. Springer Series on Environmental Management. J.W. Moore, editor. Springer-Verlag, New York, Berlin, xi + 267 p. ISBN 0-387-96709-5 (U.S.A. edition); 3-540-96709-5 (German edition). Hardcover.

This series is dedicated to serving the growing community of scholars and practitioners concerned with the principles and applications of environmental management. Each volume is a thorough treatment of a specific topic of importance for proper management practices. A fundamental objective of these books is to help the reader discern and implement man's stewardship of our environment and the world's renewable resources.

Water use can be characterized as a cyclic process aimed at improving the quality of life for humanity. As the world's population grows, so does the importance of effective water management, which in turn places greater emphasis on balancing the needs of different users. Water use cycles have many input and withdrawal points, which periodically give rise to a surplus or deficit of water. At the present time, deficit, which includes both the quality and quantity of water, is more prevalent than surplus in many parts of the world.

This book reviews the chief components of the water cycle as controlled by man and, to a lesser degree, the natural hydrologic cycle. Water users discussed include: the natural fish and wildlife population; agriculture and forestry; water storage; transportation; manufacturing; energy generation; municipalities. The environmental impact created by each of these users and the corresponding effect on other users are reviewed in detail. The book concludes with a treatment of water quality standards, which have emerged as an effective way of balancing the water needs of multiple users.

Price: DM 128.00

Orders to: Springer-Verlag, Heidelberger Platz 3, D-1000 Berlin 33, Fed. Rep. of Germany.

Selenium in Agriculture and the Environment. L.W. Taylor, editor. SSSA Special Publ. N°23. Soil Science Society of America and American Society of Agronomy, Madison, 1989, 233 p. ISBN 0-89118-789-8.

This publication provides an up-to-date account of the geochemistry, chemical reactions, and factors affecting the bioavailability of selenium in various ecosystems. Information is presented on recent selenium research on soils and ground-waters of the San Joaquin Valley. While the publication does not attempt to review selenium in animal nutrition, it does provide a perspective of how the presence of selenium in our environment relates to the plant and soil sciences, animal nutrition, and wildlife.

Price: US\$ 24.00, plus \$ 2.40 per book for all orders outside the U.S.A. Prepayment required.

Orders to: ASA/SSSA Headquarters Office, Attn. Book Order Dept., 677 South Segoe Road, Madison WI 53711, U.S.A.

Alfisols in the Semi-Arid Tropics: a Consultants' Workshop. ICRISAT, Patancheru, 1987, 188 p. ISBN 92-9066-103-8.

The Workshop, held at ICRISAT Centre, Patancheru, India from 1-3 December 1983, had the following objectives: (1) To review the important environmental, physical, chemical, and biological characteristics of Alfisols and related soils in the Semi-arid Tropics, and identify major constraints to their effective agricultural utilization; and (2) To assess the current state of the art on effective management of SAT Alfisols under rainfed conditions, with particular reference to: (a) Soil and water conservation and management; (b) Optimum requirements for effective crop establishment and growth; (c) Water-supply development and efficient use for supplemental irrigation; (d) Fertility and nutritional requirements; and (e) Alternative cropping systems.

In this publication the full proceedings are presented, with the objective of informing the scientific community in detail about alternatives and research needs for the management of Alfisols in the semi-arid tropics, as presented and discussed during the workshop.

Orders to: Information Services, ICRISAT, Patancheru P.O., A.P. 502 324, India.

Symposium on the Hydrology of Wetlands in Temperate and Cold Regions. Publications of the Academy of Finland, 4 and 5/1988. The Academy of Finland, Helsinki, 1988, Vol.1, 320 p. ISBN 951-715-215-9; Vol.2 105 p., ISBN 951-715-218-3. ISSN 0358-9153.

These two volumes contain the proceedings of the International Symposium on the Hydrology of Wetlands in Temperate and Cold Regions, which was held in Joensuu, Finland, 6-8 June 1988.

Papers were presented under the following themes: conservation of wetlands (4 papers); classification, geomorphology and properties of peatlands (16 papers); hydrology of wetlands and man's influence on it (18 papers); and water quality of peatlands and man's influence on it (18 papers). Although mostly concerned about Northern Europe, some papers on Eastern Europe, North America and China were also presented.

Requests to: Dr. Risto Andberg, Secretary of IHP National Committee, The Academy of Finland, P.O. Box 57, SF-00551 Helsinki, Finland.

Weathering; its Products and Deposits. Vol.I. Processes. Vol.II Products-Deposits-Geotechnics. K.S. Balasubramaniam et al., advisory editorial board. Theophrastus Publications, Athens, Vol.I, 1988, viii + 462 p.; Vol.II, 1989, ix + 671 p. (Hardbound).

Weathering is a reaction of the atmosphere-hydrosphere with the lithosphere. The complexity and results of this continuous reaction are, as expected, variable, complicated and of fundamental significance for our existence.

Weathering is the main exogenetic process contributing to the pattern, shape, and profile of the Earth's surface. The complex phenomenology and its relation to morphology are supplemented by the intricate processes as a result of which various soil 'covers' have been formed.

The biosphere and its reaction with the lithosphere also contribute to weathering. In addition to rheixtancy and biogenic action, organic matter in the soil makes biogenic factors more significant.

In recent years there is an increasing interest in alteration-weathering processes and in the products and deposits formed by the geochemical mobilization and re-distribution of elements under these processes.

The first volume deals with weathering processes, and contains chapters on general concepts, mineralogy of weathering products, geochemistry, marine action, loess formation and decementation. Volume II has contributions on weathering products and deposits, e.g. on bauxites, laterites, clays, residues of limestones, and on geotechnics.

Price: Vol.I US\$ 50.00; Vol.II US\$ 65.00, including mailing charges.

Orders to: Theophrastus Publications, 33 J. Theologou street, Zographou, Athens 622, Greece.

Personal Computer in Labor, Versuchs- und Prüffeld. H. Schumny, Hrsg. Springer Verlag, Berlin, Heidelberg, 1988, xv + 259 S. ISBN 3-540-18871-1.

Personalcomputer (PC) – preiswerte Komplett-Computer als Tischgerät – werden immer häufiger als 'Arbeitsplatzcomputer' auch in technischen Bereichen eingesetzt.

Ihre Verwendung in Labor, Versuchs- und Prüffeld stößt jedoch auf Schwierigkeiten oder führt gar zu Fehlschlägen, weil Möglichkeiten und Grenzen dieser Geräte falsch eingeschätzt werden, weil die Anpassung an den technische Prozeß unzureichend ist oder die Programmierung des Rechners unzuverlässig.

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Ziel des Buches ist es, dem Leser Entscheidungshilfen zur Auswahl geeigneter Personalcomputer, von Peripherie-Hardware und Software an die Hand zu geben und ihm wichtige Voraussetzungen mitzugeben, um die vielfältigen Eigenschaften von Personalcomputern wirkungsvoll zu nutzen und Meßprobleme souverän bearbeiten zu können.

Grundkenntnisse der Mikrocomputertechnik und der entsprechenden Begriffsdefinitionen werden vorausgesetzt.

Preis: DM 68.00

Bestellungen an: Springer-Verlag, Heidelberger Platz 3, D-1000 Berlin 33, Fed. Rep. of Germany.

Proceedings of an International Interactive Workshop on Soil Resources: Their Inventory, Analysis and Interpretation for Use in the 1990s. Minneapolis, March 1988. Univ. of Minnesota, St. Paul, 1988, 259 p.

A detailed soil survey for most all of the lands of the United States and several other countries will be completed in the 1990s. The use of detailed soil survey information is increasing in the areas of agricultural, forestry, and urban management and especially in assessing the environmental impacts of various activities. This demand will continue to increase in the next decade. As production mapping becomes less important, soil scientists will need to shift their emphasis to: (1) investigations to better define the soils resource, (2) the refinement of interpretations about the behaviour of that resource, and (3), perhaps of most importance, enhance the use of that interpretive information. Now is the time to prepare a plan for these shifts in emphasis. For this reason, it was decided to organize the workshop.

The objectives of this workshop were to assess ways to improve: (1) the inventory of soil resources and (2) the analysis, interpretation, and delivery for use of soil resource information to meet the increasing and varied demand for this information. Thus, themes and speakers were selected to address these issues. The themes considered in this workshop were (1) Data collection techniques to better define the soil resource, (2) Interpretations for the 1990s—kinds and research needs, (3) Computerized systems for the analysis, interpretation, delivery, and use of soil resource information now and in the future, and (4) Future roles for using soil resource information in environmental assessments.

This was an interactive workshop. After the speakers for each theme completed their presentations, the attenders were divided into small groups to further discuss the topics presented and to compose questions for each of the speakers and recommendations for each of the themes. The questions and replies from each speaker follow their paper. The attenders' recommendations are the last entry under each theme.

Price: US\$ 25.00, prepayment required.

Orders to: Nancy J. Harvey, Educational Development System, Minnesota Extension Service, University of Minnesota, 405 Coffey Hall, St. Paul, MN 55108, U.S.A.

Nutzungseinfluss auf die Stoffdynamik Schleswig-holsteinischer Böden. Humusdynamik und mikrobielle Aktivität. Schriftenreihe Inst. für Pflanzenernährung und Bodenkunde, Univ. Kiel, Nr.6(1989). L. Beyer. Inauguraldissertation, Christian-Albrechts-Universität, Kiel, 1989, 197 S. ISSN 0933-680X.

Von zwei charakteristischen Bodentypen Schleswig-Holsteins wurden Humusmetabolik und mikrobielle Aktivität unter unterschiedlicher Nutzung aufgezeigt. Die Ergebnisse dienen der Klärung des Nutzungseinflusses auf die Dynamik und Erhaltung von Bodenökosystemen.

In Ostholstein wurden dazu drei Parabraunerden (Buchen-Eichen-Forst, konventioneller und biologisch-organischer Ackerbau) und in der Holsteinische Vorgeest drei Podsole (Fichtenforst, konventioneller und biologisch-dynamischer Ackerbau) verglichen und untersucht. Eine einmalige Streu- und Humus-Stoffgruppenanalyse wurde durch mikroskopische Dünnstufuntersuchungen ergänzt. Regelmäßige Geländebeobachtungen und Ermittlung mikrobieller Kenndaten im Feld (insbesondere Bodenatmung und Zelluloseabbau) wurden zur Interpretation herangezogen. Durch diese Kombination war eine Rekonstruktion von Zersetzung und Humifizierung möglich.

Die differenzierte Horizontausbildung in der Auflage, die Einsicht in verschiedene Abbaustufen der Streu gibt, ermöglicht in den Waldböden durch die chemische und morphologische Humusanalyse eine gute Rekonstruktion des Streuabbaus. Die insgesamt niedrigen mikrobiellen Kenndaten belegen diese Ergebnisse des allmählichen Streuabbaus. Aluminium wird in toxischer Konzentration gelöst, durch organische Komplexierung aber z.T. inaktiviert.

Eine Rekonstruktion des Streuabbaus in den Ackerböden war erschwert, da keine, dem Wald vergleichbare, Horizonte mit verschiedener Abbaustufe vorliegen. Bei günstiger Witterung ist außerdem die gesamte Streu sehr schnell abgebaut. Unter Zuhilfenahme von Jahresgängen der Bodenatmung und des Zelluloseabbaus und Abbaueversuchen im Labor sind trotzdem deutliche Tendenzen sichtbar.

Die Messung mikrobieller Kenndaten im Feld ist grundsätzlich notwendig, da der Boden in der Gesamtheit, d.h. im Mikroklima des Schlages, in der Fruchtfolge und im Betriebssystem, beurteilt werden soll. Laboruntersuchungen sind für zusätzliche spezielle Fragestellungen von Vorteil, weil der größte Teil der Einflußfaktoren konstant gehalten werden kann.

Die Erfassung von Bodenatmung, Zelluloseabbauleistung, Biomasse und Enzymaktivitäten ermöglichte eine Charakterisierung der mikrobiellen Aktivität.

Bestellungen an: Institut für Pflanzenernährung und Bodenkunde, Christian-Albrechts-Universität, Olshausenstrasse 40-60, D-2300 Kiel 1, Bundesrepublik Deutschland.

Pesticides: Food and Environmental Implications: Proceedings Series, International Atomic Energy Agency, Vienna, 1988, 331 p. ISBN 92-0-010288-3.

This publication contains the proceedings of an international symposium on Changing Perspectives in Agrochemicals: Isotopic Techniques for the Study of Food and Environmental Implications, held in Neuberger, November 1987. Pesticides are an integral part of modern agriculture, also in most developing countries. Although the annual average consumption of active ingredients in agriculture may be below 0.1 kg a.i./ha, most countries now consume more than 2 kg a.i./ha; some of the intensively cropped regions in South-East Asia are exposed to even higher amounts. Inherent contamination of the environment follows if rules and regulations are not strictly adhered to. The search for safer, less persistent and more specific

pesticides and examination of the fate of applied pesticides in various regions of the world were the main themes of the Symposium. Special emphasis was placed on the use of nuclear techniques, especially on labelled compounds in research. The scientific contributions presented prove the excellence of this sometimes indispensable tool.

Price: Austrian Shillings 700.

Orders to: In U.S.A.: UNIPUB, 4611-F Assembly Drive, Lanham, MD 20706-4391, U.S.A. Elsewhere: Division of Publications, IAEA, P.O. Box 100, A-1400 Vienna, Austria.

Land Qualities in Space and Time. Proceedings of an International Symposium, Wageningen, Netherlands, 22-26 August 1988. J. Bouma and A. K. Bregt, editors, Pudoc, Wageningen, 1989, 356 p. ISBN 90-220-0973-4. Hardbound.

The symposium was organized by the ISSS Working Group MV (Soil and Moisture Variability in Time and Space) and Working Group LI (Land Evaluation Information Systems). It was sponsored and financially supported by the International Benchmark Sites Network for Agrotechnology Transfer (IBSNAT).

Land qualities are physical attributes of land that are important for its use. Examples of attributes are moisture-supply capacity, trafficability and aeration status. Different procedures are discussed to determine land qualities at different levels of detail, which can vary with the type of problem being studied. Much emphasis is placed on using existing soil survey data to obtain data to be used for modelling. In this context, geographical information systems are increasingly being used and several papers describe these systems.

After three introductory papers, 12 contributions on data collection and information systems follow. In the section on data use and simulation modelling 16 papers were presented, followed by 12 papers on studies at a regional scale and 8 on studies at field scale.

The book also contains a number of specific recommendations for future work in soil survey and land evaluation that are based on the discussions that took place during the symposium.

The proceedings of this symposium should be relevant for students, teachers and professionals involved with operational field projects.

Price: Dfl. 140.00 or US\$ 80.00.

Orders to: Pudoc, P.O. Box 4, 6700 AA Wageningen, The Netherlands.

Kinetics of Soil Chemical Processes. D.L. Sparks. Academic Press, San Diego, New York, 1989, xv + 210 p. ISBN 0-12-656440-X (Hardbound).

Chemical reaction mechanisms can be studied using thermodynamic data supplemented with reaction kinetics. As the thermodynamic approach can predict only the final state of a system from an initial non-equilibrium state, kinetic studies are needed to obtain information on mechanistic, including rates, of processes. Details of changes of components of reaction may be obtained and proposed (modelled) reaction pathways and mechanisms can be confirmed, rejected or expounded upon. Because of theoretical and experimental complexities, kinetic studies have been difficult to apply accurately, particularly in heterogeneous systems such as weathering minerals or suspensions of colloids.

The present book is a very useful and timely account of the state of the art of kinetic studies of processes in these heterogeneous systems as they occur in soils. A listing of the contents of the book illustrates its wide coverage: 1. Introduction; 2. Applications of chemical kinetics to soil systems; 3. Kinetic methodologies and data interpretation for diffusioncontrolled reactions; 4. Kinetics and mechanisms of rapid reactions on soil constituents using relaxation methods; 5. Ion exchange kinetics on soils and soil constituents; 6. Kinetics of pesticide and organic pollutant reactions; 7. Rates of chemical weathering; 8. Redox Kinetics; 9. Kinetic modeling of inorganic and organic reactions in soils.

The reader, student and researcher alike, is introduced into the various concepts and techniques and is stimulated to do further reading elsewhere so that the book remains relatively easy to digest. The extensive bibliography shows where to go for further reading.

Price: £ 23.50

Orders to: Academic Press, 24-28 Oval Road, London NW1 7DX, England; or Academic Press, San Diego, CA 92101, U.S.A.

L.P. van Reeuwijk, Wageningen, The Netherlands.

Proceedings of the 12th International Congress of Soil Science, Volume 9, New Delhi, Febr. 1982. Indian Society of Soil Science, 1986, 224 p.

This post-congress volume contains the proceedings of the congress: speeches at the opening and closing sessions, the presidential address, the summaries of plenary session papers, commission reports, resolutions of the Congress; and Keynote addresses.

A list of participants is also included.

Orders to: Dr. N.N. Goswami, c/o Indian Society of Soil Science, Div. of Soil Science and Agr. Chemistry, Indian Agricultural Research Institute, New Delhi 110012, India.

III Colloque AISS Pédologie-Téledétection-Informatique. Rapports. S. Bialousz, Redaktor. Polskie Towarzystwo Gleboznawcze, 1988, 202 p.

From 1-5 June 1981 the third Colloquium of the ISSS Working Group Remote Sensing for Soil Survey took place in Jablonna, Poland. The present publication contains 15 of the 24 papers presented at the meeting; as well as abstracts in English, French and Polish.

Requests to: Polish Society of Soil Science ul. Wisniowa 61, Warszawa, Poland.

Guide des Analyses Courantes en Pédologie. Choix-expression-présentation-interprétation. D. Baize. Institut National de la Recherche Agronomique, Paris, 1988, 172 p. ISBN 2-7380-0075-4.

Bien choisir ses analyses et maîtriser les modes d'expression des résultats, les interpréter et bien les présenter, telle est l'ambition de cet ouvrage.

Conçu comme un guide pratique, ce n'est ni un cours de pédologie générale, ni un traité d'agronomie. Il ne traite pas des 'analyses de terre' et ne propose pas de normes d'interprétation, mais il traite des analyses de sols les plus courantes en pédologie, c'est-à-dire de celles qui sont réalisées suite au creusement de fosses et tranchées sur les différents horizons des sols et des courbes pédologiques que l'on peut rencontrer en France.

Il s'adresse à tous ceux qui ont à caractériser ou qui veulent étudier ce que l'on appelle couramment 'les sols': - aux pédologues, qu'ils soient cartographes, chercheurs ou étudiants; - aux forestiers; - aux agronomes, aux agro-pédologues, aux techniciens agricoles; - à tous les spécialistes des disciplines voisines telles que biologie des sols, phyto-écologie, botanique, géologie, géographie physique etc...; - et aux enseignants des universités, lycées agricoles etc...

Prix: FF 100.00

Commandes à: INRA, Service des Publications, Route de St. Cyr, F-78026 Versailles Cedex, France.

Inventory and Evaluation of Tropical Forest Land. Guidelines for a common methodology. Tropenbos Technical Series vol. 4. L. Touber, E.M.A. Smaling, W. Andriess and R.T.A. Hakkeling. The Tropenbos Foundation, Ede, 1989, 170 p. ISBN 90-5113-008-2.

Tropenbos is the Dutch word for tropical forest, and the research programme of the same name seeks to build on the strong tradition in The Netherlands for problem-oriented research in tropical agriculture and forestry. In March 1986 the Dutch Government decided to provide initial core funding for the Tropenbos Programme over the four year period 1986-89. The focus is on the interaction of human populations and tropical forest. The overall aim is to develop interdisciplinary studies which will lead to the correct diagnosis of a forest and its land resources, as a basis for the design of systems of sustained use and conservation of forest and forest land in the tropics.

To ensure comparability of the results of research at the various locations and also to facilitate transfer and extrapolation of these data, the use of common research methodologies is promoted.

The present guidelines deal essentially with land inventory in the Tropenbos Programme at reconnaissance scale (1:100,000 - 1:250,000). This level of detail results in a broad assessment of land resources. In addition, the inventory study and subsequent aggregation of data and their qualitative evaluation serve the selection of representative sites for further detailed research. Methods to be applied in these detailed studies are not dealt with in this volume.

Although an initiative by the Tropenbos Programme and primarily meant for the mapping of its locations resources, these guidelines are considered equally valid for the inventory and multipurpose land evaluation at reconnaissance scale of any humid tropical forest land.

Price: Dfl. 30.00.

Orders to: Stichting Tropenbos, Galvanistraat 9, 6716 AE Ede, The Netherlands.

Biological Interactions in Soil. C.A. Edwards, B.R. Stinner, D. Stinner and S. Rabatin, editors. Elsevier, Amsterdam, Oxford, 1988, vi + 380 p. ISBN 0-444-87154-3 (Hardbound).

This is a reprint from *Agriculture Ecosystems and Environment*, vol. 24, no. 1-3 (1988) and contains the proceedings of a Workshop on Interactions between Soil-inhabiting Invertebrates and Microorganisms in Relation to Plant Growth, Columbus, Ohio, March 1987.

The Workshop focused specifically on invertebrate-microorganisms relationships and their impact upon ecological processes occurring in both natural and managed terrestrial systems.

Historically, there has been a gradual progression from the concept that soil is an inert medium containing chemical nutrients, to the realization that it is a complex and dynamic ecological system involving the regular recycling of resources for plant and other biological processes. Soil biology is little more than 150 years old, and only in the last 40-50 years has its importance as a scientific endeavor been fully appreciated. It was not until impetus was provided by the International Biological Program that real progress in interdisciplinary studies on ecosystems began. Even at present, many soil ecological studies involve work on either invertebrates or microorganisms independently.

There is still a dearth of information on basic soil ecology in agricultural or managed grassland and forest ecosystems. To accelerate our ecological understanding of soil systems, it is important to link organisms from different trophic groups, especially invertebrates and microorganisms. These two taxa comprise the vast majority of soil-dwelling biota. In particular, this Workshop was concerned with the developing theory that relates invertebrate-microbial ecology to plant and nutrient cycling processes.

The first 10 papers in Section I of this Volume review and extend the concepts relating interactions to organic matter decomposition and turnover, energy flux and nutrient cycling in different types of terrestrial ecosystems. These papers present a range of views on ecological interactions spanning a diversity of natural and managed ecosystems.

Section II addresses interplay among soil-inhabiting biota in rhizospheres and the resulting influences on plant growth and nutrient uptake. Particular emphasis has been placed on foodweb structure and function, and on symbiosis associated with mycorrhizal fungi.

Section III deals predominantly with agricultural ecosystems in that the authors focus on soil-inhabiting plant pests and diseases. The papers span topics on bacteria, fungi, and nematodes, with special attention paid to interactions between these organisms and antagonists, and implications for the biological control of plant pests. This section also contains two papers addressing the role of genetic engineering and the ecological questions concerning the introduction of alien microorganisms into soil systems.

Section IV of the book is synthetic in that the papers refocus the topics toward plant and ecosystem processes.

Price: Dfl. 275.00 or US\$ 135.00.

Orders to: In North America: Elsevier Science Publ. Comp., P.O. Box 882, Madison Square Station, New York, NY 10159, U.S.A. Elsewhere Elsevier Science Publ., P.O. Box 211, 1000 AE Amsterdam.

Vegetation Science Applications for Rangeland Analysis and Management. Handbook of Vegetation Science vol. 14. P.T. Tueller, editor. Kluwer Academic Publishers, Dordrecht, Boston, 1988, xiii + 642 p. ISBN 90-6193-195-9 (Hardbound).

The world's rangelands constitute an important global resource. Range has been defined by the Society for Range Management as land which supports vegetation useful for grazing on which routine management of that vegetation is through manipulation of grazing rather than cultural practices. If forested ranges and natural vegetation in tropical savanna and tundra areas are included, the total land area of the world that can be classified as rangeland may be as high as 47 percent of the global land surface. On a world wide basis this would total 332 million hectares. This extensive land resource must be carefully managed in perpetuity. The vegetation resource on these lands is often sparse and droughty. Therefore these lands often require an extra measure of management in order to provide forage and wildlife habitat as well as other uses on a sustained yield basis. The present book is directed toward the understanding of how the vegetation sciences have been used or can be used in the future to properly manage such a valuable resource. The first few chapters explain how basic vegetation sciences have been used to research rangeland management. The later chapters offer evidence of how the vegetation sciences have provided valuable data and information useful to rangeland, grassland and veld managers around the globe. Topics include synecology, succession, range conditions and trends, wildlife habitat on rangelands, ecophysiology, vegetation-soil relationships, vegetation-hydrology interactions on rangelands, grazing management and other important subjects.

Price: Dfl. 325.00, US\$ 175.00, £ 95.00.

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

Introduction and Guide to the Geographic Information System Tutorial (GIST). Geir-Harald Strand and Md. Ehsan Ullah. Norwegian Computing Center, 1989, 70 p. ISBN 82-539-0314-6. With one diskette.

The Geographic Information System Tutorial (GIST) is a simple raster based package that can carry out spatial analysis on a limited dataset. The package is aimed at training, not analysis. Hence, it has some serious limitations attached to the range of data that can be handled. On the other hand, most basic GIS functions such as the manual input of geodata in both raster and vector formats; data recording by single value, range of values, logical statements and by corridors; and different techniques for map overlay can be carried out by the package.

The GIST is written and compiled in Turbo-Pascal 4.0. It is configured for IBM-XT/ATs or compatibles, preferably with a hard disk, using an EGA card and monitor, and running under MS-DOS version 3.2 or above. Hardcopy graphic printouts require a dot matrix printer supporting the IBM print-screen function.

GIST is easy to use for people with a background in geography and some elementary computing knowledge.

Price: US\$ 25.00 (manual and software)

Orders to: Norwegian Computing Center, P.O. Box 114, Blindern, 0314 Oslo 3, Norway.

A. Bregt, Wageningen, The Netherlands

Applications of Continuous and Steady-State Methods to Root Biology. Developments in Plant and Soil Sciences vol. 34. J.G. Torrey and L.J. Winship, editors. Kluwer Academic Publishers, Dordrecht, Boston, 1989, xv + 245 p. ISBN 0-7923-0024-6 (Hardbound).

This book provides an illustration of the interrelationship between progress in scientific methodology and conceptual advances. In many cases these methods have replaced or supplemented older methods, such as measurement of total fixed nitrogen by the Kjeldahl methods at the end of the experimental period. Although many of these older methods will continue to be needed, continuous and steady-state methods have to obvious advantages that more data are accumulated during the experimental period and that the effects of perturbations to the system can be readily studied. In addition, such methods usually require that the measurement methods cause minimal effects on the experimental organism and its environment. Thus results obtained may be rather different than results from other methods, which often involve excision of plant parts. Excision in some cases (but not all) leads to unacceptable effects on nodule and root properties, as discussed in Chapters 5 and 8.

Although the manual approaches to steady-state and continuous methods discussed in Chapter 3 are often adequate, such methods often require or are greatly facilitated by the use of automated equipments and computer control. Chapter 1 serves as a useful guide to this approach.

Mathematical models often provide the connection between theory and experiment. Chapters 2, 6 and 7 provide introductions to this approach, and are presented in a more digestible form than is possible in journal articles. Chapter 2 also provides independent evidence for the presence of a variable diffusion barrier in legume nodules.

Price: Dfl. 135.00, US\$ 79.00, £ 45.00.

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

Ecological Impact of Acidification. Proceedings of the Joint Symposium Environmental Threats to Forest and other Natural Ecosystems; Oulu, Finland, November 1988. I. Szabolcs, editor. Hungarian Academy of Sciences, Budapest, 1989, 166 p.

The Academies of Sciences of Finland, Austria, Hungary and Sweden initiated a joint project in order to study the environmental threats of acidification in the countries. In some of them it is the forests, in others the soils which are mainly exposed to acidification and consequently the kind and rate of processes are also different.

The present publication contains the texts of the sixteen papers presented at the Workshop. This collection will be valuable material, as it summarises the research and achievements in the four countries and is a fundament for the necessary follow-up.

Requests to: Prof. I. Szabolcs, Research Institute for Soil Science and Agricultural Chemistry, Herman O. ut 15, H-1022 Budapest, Hungary.

Underdeveloping the Amazon. S.G. Bunker, The University of Chicago Press, Chicago and London, 1988, 279 p. ISBN 0-226-08032-3. Paperback.

The subtitle of this interesting book is extraction, unequal exchange, and the failure of the modern state. It shows how different extractive economies have periodically enriched various dominant classes but progressively impoverished the entire region by disrupting both the Amazon Basin's ecology and human communities.

Contending that traditional models of development based almost exclusively on the European and American experience of industrial production cannot apply to a regional economy founded on extraction, the author proposes a new model based on the use and depletion of energy values in natural resources as the key to understanding the disruptive forces at work in the Basin.

Furthermore, it is a contribution to the broader debate on the experience of other less developed parts of the world.

Price: US\$ 14.95

Orders to: The University of Chicago Press, 5801 S Ellis Ave., Chicago, IL 60637, U.S.A.

Eremology (Desert Sciences). Proceedings of a Post-Graduate Course, Ghent, Belgium, 31 August–25 September 1987. M. De Boodt and R. Hartmann, editors. Fac. Landbouwwetenschappen, Rijksuniversiteit, Gent, 428 p.

The primary objective of this training course was to provide an interdisciplinary understanding of the specific and fragile ecological and social balance in semi-arid and arid areas.

From the 35 lectures presented about thirty are included in the proceedings. Apart from the assessment of the different aspects of degradation, preventing and combatting desertification is discussed, this to sustain arid and semi-arid zone productivity and ensure future habitability. Different presentations deal with practical studies to slow down the rate of degradation of natural resources.

Price: BF 1000 or US\$ 25.00

Orders to: Dept. of Soil Physics, Fac. of Agricultural Sciences, State University Ghent, Coupure Links 653, B-9000 Ghent, Belgium.

New Journals/Nouveaux Périodiques/Neue Zeitschrifte

ITC Journal. 1988-1. Special ILWIS issue. A. Stewart, editor. International Institute for Aerospace Survey and Earth Sciences (ITC), Enschede, 1988, 131 p. ISSN 0303-2434.

In this issue the Integrated Land and Watershed Management Information System (ILWIS) is explained, and examples of its use are given. The system combines conventional GIS procedures with image processing capabilities and a relational database. It is designed for use with microcomputers. The system uses both vector and raster graphics data storage. One of the most important facilities of ILWIS is modelling, i.e., the preparation of 'scenarios' indicating the effects of various actions, to assist decision makers in evaluating proposed development/conservation plans. See also entry in book review section.

Price: DFL 20.00 (about US\$ 11.00) plus postage, by International Postal Money Order.

Orders to: ITC, P.O. Box 6, 7500 AA Enschede, the Netherlands.

Global Climate Change Digest. A guide to Current Information on Greenhouse Gases and Ozone Depletion. R.W. Pratt, editor. Elsevier. ISSN 0897-4268.

This newsletter is a single consolidated source for research and policy information on the causes, effects, and responses to global climate changes triggered by human industrial activity and man-made compounds, including: emission control, engineering and alternative technologies, atmospheric science, ecological management, and environmental law.

Each month this bulletin delivers information on the critical topics of stratospheric ozone depletion and global warming through the continuing build-up of atmospheric carbon dioxide, chlorofluorocarbons, methane, and other 'greenhouse' gases. The Digest is supported by an international board of editorial advisors, including eminent scientists and researchers.

Subscription price: (1989, 12 issues) US\$ 190.00.

Orders to: see below.

Acid Precipitation Digest. A summary of current news, research and events. R.W. Pratt, editor. Elsevier. ISSN 0740-2252.

This newsletter delivers unbiased international coverage of all aspects of the acid rain issue, as well as long-range transport of other air pollutants. It provides easy access to current, accurate information on acid rain research sponsored by the federal, state and provincial, and private sectors. The newsletter links concerned parties from a wide range of disciplines and interests, including: aquatic and terrestrial biology, chemistry, atmospheric science, forestry, agriculture, materials science, engineering, economics, law, public policy, and pollutant emissions and control.

The Digest is published in cooperation with the Air Resources Information Clearinghouse - a project of the Center for Environmental Information, Inc.

Subscription price: (1989, 12 issues) US\$ 190.00.

Orders to: North America: Elsevier Science Publ.Co., P.O. Box 882, Madison Square Station, New York, NY 10159, U.S.A. *Elsewhere:* Elsevier Science Publ., P.O. Box 211, 1000 AE Amsterdam, the Netherlands.

Agroforestry Abstracts. CAB International in association with the International Council for Research in Agroforestry (ICRAF). CAB, Wallingford. Quarterly. ISSN 0952-1453.

Agroforestry is a collective term for all land-use systems and practices in which woody perennials are deliberately grown on the same land management unit as crops and/or animals. Although the word is relatively new, the concept is old. Throughout history, and in both temperate and tropical regions, the cultivation of combinations of tree species and agricultural crops has been practised.

Examples of agroforestry practice in action include: shade trees in coffee and cocoa plantations in the tropics; sheep or cattle grazing under rubber and coconut plantations in the tropics and under pine plantations in temperate zones; shrimp and fish farming in the mangroves of SE Asia; traditional home gardens in Indonesia and other parts of the tropics; and live fences in tropical America.

More recently, the resurgence of interest in and research on agroforestry has arisen because of its potential to contribute to sustainable agricultural production, especially in developing countries. Agroforestry conserves natural resources while enhancing agricultural output from farm land.

The new journal will publish about 1000 abstracts per year and serves the information needs of agroforesters in various international, national and regional institutions throughout the world, enabling them to survey recent literature on the subject. The journal contains a comprehensive coverage of the world's literature on agroforestry. Sources of scientifically significant articles include over 10,000 serials as well as books, conference proceedings and technical reports. It has detailed summaries of the publications, grouped per topic, and presents overviews of aspects of this rapidly expanding field and critical review articles at least twice a year.

Subscription price: (1989) US\$ 92.00 in the Americas, £ 48.00 elsewhere.

Orders to: CAB International, Wallingford, Oxon OX10 8DE, England; or: CAB International, 845 North Park Avenue, Tucson AZ 85719, U.S.A.

Ecological Economics. The Journal of the International Society for Ecological Economics. R. Costanza, editor-in-chief. Elsevier, Amsterdam, Oxford. Four issues per volume. ISSN 0921-8009.

This new journal is concerned with extending and integrating the study and management of 'nature's household' (ecology) and 'mankind's household' (economics). This integration is necessary because conceptual and professional isolation have led to economic and environmental policies which are mutually destructive rather than reinforcing in the long term. The journal is transdisciplinary in spirit and methodologically open.

Specific research areas covered include: valuation of natural resources, sustainable agriculture and development, ecologically integrated technology, integrated ecologic-economic modelling at scales from local to regional to global, implications of thermodynamics for economics and ecology, renewable resource management and conservation, critical assessments of the basic assumptions underlying current economic and ecological paradigms and the implications of alternative assumptions, economic and ecological consequences of genetically engineered organisms, and gene pool inventory and management.

Subscription price: (1989) US\$ 135.25 or Dfl 257.00 incl. postage.

Orders to: Elsevier Science Publ., P.O. Box 330, 1000 AH Amsterdam, The Netherlands; *or:* Elsevier Science Publ. Co., 655 Avenue of the Americas, New York NY 10010, U.S.A.

Bayreuther Bodenkundliche Berichte. I. Kögel-Knabner, Schriftleitung. Lehrstuhl für Bodenkunde und Bodengeographie, Universität Bayreuth, Bayreuth. ISSN 0931-6442.

Since 1987 a series of publications have started, which is issued by the Department of Soil Science and Soil Geography of Bayreuth University, Fed. Rep. of Germany.

About four volumes will appear annually, and consist mostly of Ph.D. theses. The price ranges between DM 15 and about DM 35; they are in German with English summaries.

Orders to: Dr. Ingrid Kögel-Knabner, Lehrstuhl für Bodenkunde und Bodengeographie, Universität Bayreuth, Postfach 3008, D-8580 Bayreuth, Fed. Rep. of Germany.

Global and Planetary Change. A daughter journal of Palaeogeography, Palaeoclimatology, Palaeoecology. Elsevier Science Publishers, Amsterdam, Oxford. E. Barron, S. Cloetingh, et al., editors. Quarterly. ISSN 0921-8181.

Planetary change characterizes the Earth system. The record from the earliest rocks to the most recent measurements from space describe a rich record of pervasive global change. An inventory of events and trends in Earth history is preserved in rocks and sediments. Historical records and modern observations depict variability on time scales of centuries to decades. Within this short time period, the role of humans in altering the global environment is becoming increasingly clear. The prospect of future global change follows from the spectrum of Earth observations and from the realization that humans are a major element in generating global change.

The scientific problems associated with understanding the Earth as a planet, and the critical needs of humans to understand how the Earth system operates are the impetus for this new journal. Its objective is to achieve an interdisciplinary view of the causes, processes and limits of variability in planetary change. The objectives naturally focus attention on the complex, interacting components of the Earth including the global hydrologic cycle, biogeochemical cycles, the physical climate system, the interplay of global tectonics and solar-driven processes, the environment for life, and the human interaction with global change. Consequently, topics will include but are not limited to, changes in the chemical composition of the oceans and atmosphere, climate change, sea level variations, human geography, global tectonics, global ecology and biogeography.

Subscription price: (1989) US\$ 135.00

Orders to: Elsevier Science Publ., Journals Dept., P.O. Box 211, 1000 AE Amsterdam, The Netherlands.

AgBiotech News and Information. CAB International, Wallingford. Bi-monthly. ISSN 0954-9897.

In terms of both subject area and political consequence, biotechnology has grown dramatically. Not so many years ago the subject appeared to be centred on very fundamental research, with little immediate relevance to agricultural practitioners or scientists. But now the potential of biotechnology for agriculture is or priority concern to planners and policy-makers. Already some research results are having an impact, particularly in the fields of plant breeding and animal health. Most of these developments have originated in the developed world, but they could equally find application in developing countries, where the need for improved agricultural production is acute.

In publishing this new journal, CAB International has as its objective the rapid transfer of information on biotechnology, for both the scientist and the policy-maker. The journal contains a comprehensive selection of abstracts of the world's literature on agriculture, as well as topical new items and a selection of short reviews. Each issue has about 1000 abstracts.

Orders to: CAB International, Wallingford, Oxon OX10 8DE, England; *or:* CAB International, 845 North Park Avenue, Tucson AZ 85719, U.S.A.

Specifications of the ISSS-COSTED Fellows Fund

The fund is meant to promote active participation of young ISSS members of developing countries in international scientific meetings, especially those taking place in their own continent, by providing partial support in the costs of travel or subsistence.

– eligible to benefit from the fund are promising young soil scientists of developing countries of limited personal or institutional financial means. They should have at least at BSs level of education, preferably by under 35 years of age, have several years of experience in one of the branches of soil science, and be a member of ISSS for at least two years.

– only international meetings that are officially sponsored by ISSS can be considered, and with preference those that take place within the continent of the applicant's residence.

– applications are to be directed to the organising committee of the meeting, which thereupon submits the names until six months before the meeting to the Secretary-General ISSS with its recommendations. The Secretary-General, in consultation with the Treasurer and the other Officers of the Society where necessary, decides which applicants are to be supported and what amounts can be allotted. The Treasurer of ISSS will then transfer these amounts to the Organising Committee.

– the maximum number of applicants to be supported per event is four, and the maximum subsidy per person US\$ 500,- or equivalent.

– soonest after the event the successful applicant will submit a short report on the meeting, with the relevant receipts, to the Secretary-General or Treasurer.

Spécifications du fonds pour aspirants de l'AISS-COSTED

Le fonds est destiné à promouvoir la participation active de jeunes membres de l'AISS des pays en voie de développement dans des réunions scientifiques internationales spécialement lorsque ces réunions ont lieu dans leur propre continent, en apportant une contribution partielle aux frais de voyage et de séjour.

– ceux qui peuvent bénéficier du fonds sont de jeunes pédologues prometteurs appartenant à des pays en voie de développement et qui ont des moyens financiers ou institutionnels limités.

Ils doivent avoir au moins le niveau d'enseignement BSc, avoir de préférence moins de 35 ans, avoir quelques années d'expérience dans une des branches de la science du sol et être membre de l'AISS depuis au moins 2 ans.

– seules les réunions internationales officiellement parrainées par l'AISS seront prises en considération et de préférence celles qui se tiennent sur le continent où réside le candidat.

– les demandes doivent être adressées directement au comité organisateur de la réunion que soumet ensuite les noms au moins 6 mois avant la réunion au SG de l'AISS avec ses recommandations. Le SG, après avoir consulté le Trésorier et les autres responsables de la Société si nécessaire, décide quels sont les postulants qui seront aidés et quelle somme leur sera allouée. Le Trésorier de l'AISS transférera ensuite cette somme au Comité Organisateur.

– le nombre maximum de postulants aidés par manifestation est de 4 et le subside maximum par personne est de US\$ 500 ou son équivalent.

– aussitôt après cette manifestation l'heureux postulant soumettra un rapport succinct sur la réunion, avec les reçus concernant les dépenses, au SG ou au Trésorier.

Condiciones del Fondo para becarios de la SICS-COSTED

El Fondo pretende promover la activa participación de jóvenes miembros de la SICS de países en desarrollo en reuniones científicas internacionales, especialmente aquellas que tienen lugar en su propio continente, mediante la provisión parcial de apoyo, bien en los cortes de viaje, bien en los de estancia.

– Candidatos a los beneficios del Fondo son prometedores jóvenes científicos de suelos de países en vías de desarrollo con limitados medios económicos personales o institucionales. Deberán tener al menos un nivel BCs de educación, preferiblemente de menos de 35 años de edad, con varios años de experiencia en alguna de las ramas de la ciencia del suelo y ser miembros de la SICS por al menos dos años.

– Sólo reuniones internacionales que sean oficialmente promovidas por la SICS podrán ser consideradas, y con preferencia aquellas que tengan lugar dentro del continente de residencia del solicitante.

– Las solicitudes serán dirigidas al comité organizador de la reunión, el cual enviará los nombres hasta seis meses antes de la reunión al Secretario General de la SICS con sus recomendaciones. El Secretario General, en consulta con el Tesorero y los otros Directivos de la Sociedad cuando sea necesario, decidirá que solicitantes van a ser atendidos y que cantidades pueden ser asignadas. El Tesorero de la SICS transferirá luego estas cantidades al Comité Organizador.

– El número máximo de solicitudes concedidas para cada ocasión es de cuatro y el máximo subsidio por persona es de 500 dolares USA o su equivalente.

– Lo antes posible después de la reunión cada solicitante seleccionada enviará un breve informe de la reunión, con los correspondientes recibos, al Secretario General o Tesorero.

The Fellows Funds, or 'young scientists travel fund' is now being supported by the members of the national Soil Science Societies of the Netherlands, the United Kingdom, Canada and the U.S.A. These contributions are complemented by an annual contribution of ISCU's COSTED committee.

**ISSS COOPERATING JOURNALS/JOURNAUX COOPERANTS DE L'AISS/
IBG KOOPERIERENDE ZEITSCHRIFTE**

1. CATENA, an interdisciplinary journal of Soil Science-Hydrology-Geomorphology, focusing on Geoecology and Landscape Evolution.
Size: 6 issues per year, in one volume of about 600 pages.
Publisher: Catena Verlag, 3302 Cremlingen 4, F.R. of Germany
Editor-in-Chief: Dr. M. Rohdenburg, Braunschweig, FRG
Full subscription rate, including surface mailing: DM 379.00
Personal subscription price for ISSS members (available from the Publisher only): DM 133.00 (about US\$ 67.00; 65% discount). A discount of 40% applies to the issues of CATENA SUPPLEMENT.

2. SOIL BIOLOGY & BIOCHEMISTRY
Size: 6 issues per year, in one volume of about 700 pages.
Publisher: Pergamon Press Ltd., Oxford, England.
Editor-in-Chief: Prof. Dr. J.S. Waid, Bundoora, Australia.
Full subscription rate, including surface mailing: US\$ 210.00.
Personal subscription price of ISSS members: US\$ 42.00 (80% discount).

3. GEODERMA, an International Journal of Soil Science.
Size: 8 issues per year, in 2 volumes of about 400 pages each.
Publisher: Elsevier Science Publishers, Amsterdam, the Netherlands.
Editor-in-Chief: Dr. R.W. Simonson, College Park, MD, USA.
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Personal subscription price for ISSS members: Dfl 170 (US\$ 89.-; 66% discount)

4. BIOLOGY & FERTILITY OF SOILS
Size: Eight issues per year, in two volumes of about 720 pages.
Publisher: Springer Verlag, Berlin-Heidelberg-New-York-Tokyo.
Editor-in-Chief: Prof. Dr. J.C.G. Ottow, Giessen, Fed. Rep. of Germany.
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Todas las personas involucradas en el estudio y la aplicación de la ciencia del suelo pueden ser miembro de la Sociedad Internacional de la Ciencia del Suelo. Las solicitudes de inscripción pueden ser enviadas a través de las Sociedades Nacionales o directamente a la Secretaría General. Para miembros individuales la cuota anual, a ser pagada durante el mes de Enero, es de US\$ 8 (8 dolares EUA) o su equivalente en cualquier moneda convertible. Aportes voluntarios que permiten promover la Sociedad son muy apreciados y serán mencionados en el Boletín de la SICS. Los pagos individuales pueden ser realizados por medio de un cheque o un orden de pago internacional. También los cupones de la Unesco pueden ser utilizados. Con el objeto de reducir los cargos bancarios se recomienda efectuar los pagos en lo posible a través de las Sociedades Nacionales (para las direcciones ver Lista de Socios 1986). Suscripciones al Boletín, sin ser miembro, de parte de Servicios de Bibliotecas, Institutos etc. son de US\$ 15.- por año.

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