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der internationalen bodenkundlichen gesellschaft

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

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Season's Greetings
Meilleurs Voeux
Beste Glückwünsche

The Officers of the International Society of Soil Science
Le Bureau de l'Association Internationale de la Science du Sol
Der Vorstand der Internationalen Bodenkundlichen Gesellschaft

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The 13th International Congress of Soil Science, Hamburg, August 1986 FINAL REPORT OF THE ORGANIZING COMMITTEE

The XIIIth Congress, which took place in Hamburg August 13–20, enjoyed a high participation of delegates from many countries. As at August 14 somewhat more than 1500 participants in total were registered, coming from 85 countries in the following continents: Europe: 54%; North America: 15%; Latin America 3%; Asia: 17%; Africa: 7%; Australia/New Zealand: 4%.

Except for the seven plenary sessions and 24 symposia with invited speakers, 980 voluntary contributions were offered, of which about one third was presented orally and two thirds as posters.

The poster sessions attracted an especially high number of interested visitors. This was principally due to the fact that the participants were free from commitment of parallel sessions, that they could speak directly to the authors and visit the subject of their interest without regard to time. Furthermore, due to the large number of contributions, the exposition gave a good overview of the soil research in all represented countries.

The original programme of 14 tours was carried out with the exception of tour F, which had to be cancelled because of too few participants. Tour B was changed to a boustour, instead of the planned tour by boat, as too few persons showed interest. In total over 600 excursion tickets were sold.

The congress papers in the form of 4 volumes were given to the participants upon registration. Volume I contains the full text of the papers presented in the plenary sessions, and Volumes II–IV extended abstracts. The symposia papers will be printed early in 1987. A limited number of volumes with congress papers is available. Information can be obtained from the Organizing Committee or the Office of the Secretary-General of the ISSS.

The Organization Committee wishes to express its appreciation to the Secretary-General, Dr. W. Sombroek, to the Treasurer, Dr. D. Gabriels, as well as to the former officers of the Commissions for their help and cooperation. Through their participation in drawing up the programme and especially for choosing the plenary speakers and the symposia coordinators – they have contributed considerably both to successful planning and, by their energetic cooperation during the Congress, to a successful Congress itself.

Many thanks should also be extended to all co-workers and assistants of the local organization, the Hamburger Messgesellschaft (HMC), and above all to Mrs. Ch. Kuchenbuch as well as to the local secretary Dr. B. Hintze (University of Hamburg). Without their constant dedication much would not have run smoothly.

For the Organisation Committee,
the Chairman:

K. H. Hartge

RAPPORT FINAL DU COMITÉ D'ORGANISATION

Le XIII^{ème} Congrès a accueilli environ 1500 participants venus de 85 pays. D'après la liste des inscriptions établie le 14 août, la répartition des participants par continent d'origine se composait comme suit: Europe: 54%; Amérique du Nord: 15%; Amérique Latine: 3%; Asie: 17%; Afrique: 7%; Australie/Nouvelle Zélande: 4%.

A côté des 7 conférences plénières et des 24 symposiums pour lesquels des conférenciers avaient été invités, il y a eu environ 980 communications volontaires. Environ un tiers en a été présenté oralement, les deux autres tiers sous forme de poster.

L'exposition de posters s'est avérée très attractive. Les raisons de ceci étaient l'absence de séances parallèles qui se sont révélées incompatibles avec les réunions des commissions, et le fait que chaque participant ait eu la possibilité de parler directement aux auteurs et de consacrer son temps aux sujets pour lesquels il avait un intérêt particulier.

De plus, l'exposition a donné un aperçu relativement complet de la plupart des problèmes urgents de par le monde, et des résultats les plus récents dans notre domaine scientifique.

Quatorze excursions avaient été prévues au programme. Le plupart d'entre elles se sont déroulées comme prévu. L'excursion F a dû être annulée à cause du trop petit nombre de participants. L'excursion B, dont une partie devait s'effectuer en bateau, a dû finalement opter pour l'autobus pour la même raison. Au total, 600 places ont été réservées pour ces excursions.

Les volumes I à IV des compte-rendus ont été remis aux participants inscrits. Le premier volume comprend les textes complets des conférences plénières, les volumes II à IV, les résumés détaillés des communications volontaires. Le volume comprenant les résultats des symposiums sera publié au début de 1987.

Le Comité d'Organisation remercie sincèrement notre Secrétaire Général, Dr. W. Sombroek, pour son aide et sa collaboration, notre Trésorier, Dr. D. Gabriels, et les membres des bureaux des commissions pour ces quatre dernières années. Leur contribution à l'établissement de notre programme – la sélection des conférenciers et des coordinateurs pour les symposiums a contribué pour une grande part à cette réussite –, leur engagement effectif au cours du congrès a été à l'origine de la bonne marche de notre programme.

Nous adressons nos remerciements les plus cordiaux à tous les collaborateurs et assistants des organisations locales et des services administratifs – Le Centre des Congrès de Hambourg (HMC), particulièrement Mme Ch. Kuchenbuch et notre secrétaire local, Dr. B. Hintze (Université de Hambourg). Sans leur travail efficace, tout ne se serait pas déroulé aussi facilement.

Pour le Comité d'Organisation,
le Président:

K. H. Hartge

ABSCHLUSSBERICHT DES ORGANISATIONSKOMITEES

Der XIII. Kongress, in Hamburg vom August 13.–20. hatte sich einer regen Teilnahme erfreut. Insgesamt wurden etwas über 1500 Teilnehmer registriert, die aus 85 Ländern kamen. Nach dem Registrationsstand vom 14. August kamen sie aus folgenden Kontinenten: Europe: 54%; Nordamerika: 15%; Lateinamerika 3%; Asien: 17%; Afrika: 7%; Australien/Neuseeland: 4%.

Außer den sieben Plenarsitzungen und 24 Symposien mit geladenen Rednern, waren 980 freie Beiträge angekündigt, von denen ca. 1/3 oral, 2/3 als Poster präsentiert wurden. Die Posterausstellung erfreute sich besonders hoher Beteiligung. Dies lag sicher daran, daß die Teilnehmer hier nicht wie bei den Oralpräsentationen durch Parallelabläufe behindert wurden, daß sie jeden autoren nach Belieben ansprechen und die Objekte ihres Interesse zeitunabhängig aufsuchen konnten. Darüberhinaus gab die Ausstellung durch die große Anzahl der Einzelbeiträge ein gutes Abbild des Forschungsgegens in der bodenkunde aller beteiligten Länder.

Das Exkursionsprogramm aus ursprünglich 14 Touren lief mit Ausnahme einer Tour ab, die Tour F mußte wegen Mangel an Teilnehmern gestrichen werden. Tour B mußte als Bustour durchgeführt werden, für die ursprünglich vorgesehene Schiffstour war die Beteiligung zu gering. Insgesamt wurden über 600 Exkursionsplätze verkauft.

Die Kongreßberichte wurden inform der Bände I–IV den Teilnehmern bei der Registrierung ausgehändigt. Band I enthielt die Plenarvorträge im Volltext, Band II–IV die verlängerten informativen Kurzfassungen. Die Bände der Symposien werden Anfang 1987 gedruckt.

Die Tangungsberichte sind in begrenzter Anzahl verfügbar. Informationen darüber gibt das Organisationskomitee oder der IBG Generalsekretär.

Das Organisationskomitee dankt für die Hilfe und Kooperationsbereitschaft des Generalsekretärs Dr. W. Sombroek, des Schatzmeisters Dr. D. Gabriels sowie der Amtsträger der Kommissionen der vergangenen Amtsperiode. Durch ihre Beteiligung an der Ausarbeitung des Programmes – speziell der Auswahl der Plenarredner und der Symposienkoordinatoren – trugen sie wesentlich zum Gelingen der Planung, durch ihre tatkräftige Mitarbeit während des Kongresses zum Gelingen des Kongresses bei.

Herzlicher Dank gebührt ferner allen Mitarbeitern und Helfern der lokalen Organisation, der Hamburger Messegesellschaft (HMC) und vorallem Frau Ch. Kuchenbuch sowie dem lokalen Sekretär Dr. B. Hintze (Universität Hamburg) ohne deren stete Einsatzbereitschaft vieles nicht gelaufen wäre.

Für das Organisationskomitee,
Der Vorsitzende:

K. H. Hartge

The Congress in retrospect

The 13th Congress was certainly a great success, not only as regards the final number of participants, but also because of the organisational talents of our German colleagues, and the facilities at the spacious building of the Hamburg Congress Centre.

Especially attractive and convenient was the huge exposition space. Part of it was utilized for permanent exhibits of maps by various State Services of the Federal Republic of Germany; the new soil maps of the EEC countries and of Middle Europe; the activities of international organisations and programmes such as IBSRAM, IBS-NAT, ORSTOM and ISRIC; the publications of the four ISSS-Cooperating Journals; a commercial bookseller, and a company on soil research equipment.

A major part was reserved for the poster sessions. Per day and per Commission or Working Group a large number of poster contributions were shown. They were often of high quality (see also the Honours section in this Bulletin for the awarded ones) and they attracted huge number of participants. The arrangement of these posters, and the time reserved for explanations, allowed for intensive contacts between authors and discussants.

The Opening Session of the Congress, refreshingly unceremonious, started with short addresses by the major of the 'Free and Hanseatic City' of Hamburg, Dr. K. von Donanyi, and spokesmen of the United Nations Specialised Agencies FAO, Unesco and UNEP and of the Worldbank/CGIAR, all of them sponsors of a substantial number of Congress participants. After a formal welcome by the President of the German Soil Science Society, Prof. Dr. H. Kuntze, the President of ISSS presented the opening lecture on the Congress theme: 'Demands on Soils, increasing in intensity and diversity'. Then followed the Secretariat/Treasury's report (see Bulletin 69).

The afternoon, and each of the following days, started with a Plenary Session, where successively a topical subject pertaining to the mandate of each of the standing scientific Commissions were highlighted by scientists of international acclaim for the full audience. They were: the irrigation of land with large spatial soil variability (J. T. Ritchie, USA); essential and toxic heavy metals in soils and their ecological relevance (K. G. Teller, Australia); demands and controls on organisms in soil (J. M. Lynch, UK); soils and world food supplies (N. C. Brady, USA); the role of pedology in meeting the increasing demands on soils (R. Dudal, Belgium); impact of farming systems on



Words of welcome by the President of the Deutsche Bodenkundliche Gesellschaft Prof. Dr. H. Kuntze (l) and by the Major of Hamburg City Dr. K. von Donanyi (r).

soil erosion in the tropics (R. Lal, Nigeria), and mineralogy of surface-mined lands (J. B. Dixon et al., USA).

Specialist participants were offered much interesting material through the oral presentations in Commission sessions, sessions of Working Groups, and joint symposia of two Commissions, or of a Commission together with international organisations and programmes or country groups. To mention a few subjects: newest data on soil acidification; nitrate pollution of groundwater; influence of microbiological activities on redox processes and plant nutrition; transport mechanisms in soils; land evaluation; management problems of wetland soils; soil variability in relation to measurement techniques; experimental pedology; organic matter in soils; optimizing the physical properties of the rooting zone; aspects of soil micromorphology; aspects of N-nutrition; regional pedological studies; processes of soil erosion; pedological and terrain information systems; intensive use of Chinese soils; etc. There was also a well-attended symposium on National Soil Policies, organised by UNEP.

The above range of topics may illustrate that soil science and its applications is now covering a very broad terrain on the one hand, while intensive specialistic research is being carried out for each of the branches on the other hand. At the same time there is an open eye for integration of the various disciplines, and for new research methods such as remote sensing, geostatistics, development of models, ultra microscopy, etc. There is not only much attention for soil management and fertilizing for all kinds of crops, but also for the control of soil degradation and the protection or recuperation of important ecosystems. In the branch of mapping, classification and evaluation of soils there is much activity in the refinement of different systems – though not yet on their compatibility. More and more interest is drawn to the physical properties of soils, their spatial variability, and the short-term dynamic processes.

The changing scala of subjects put into question whether the present scientific structuring of the Society (soil physics, soil chemistry, soil biology, etc.) should not be modified to give more concerted attention to major groups of the world's soils. The reconstituted and enlarged Committee on Statutes and Structure is looking into this matter.

In-between the technical sessions, the various Commissions, Subcommissions and Working Groups held business sessions, where elections for new office-bearers were carried out. The machinery for these elections still leaves to be desired, although it was substantially improved in comparison to earlier occasions.

The Closing Session was marked by an introduction on the aims and programme of the new International Board for Soil Research and Management (Drs. F. Bentley and M. Latham), and by words of encouragement on inter Union-inter Societal cooperation (World Data bases development; International Geosphere – Biosphere Programme) by the Executive Secretary of ICSU, Dr. M. Baker. This was followed by the Report of the Council, the acclaim of four new Honorary Members, the presentation of Poster Awards, the acceptance of two formal Resolutions, and the handing-over of duties to the new Executive Committee, to serve for the forthcoming four years.

The social programme in the evening was very enjoyable: welcome reception by the Organising Committee; reception by the Hamburg Senate in its magnificently reconstructed Rathaus; garden party and folklore after a boatripe on the Elbe river. Also the sightseeing tours for accompanying persons and on the Sunday break were reportedly quite animated.

Though they will be the first to point out some minor flaws, the members of the Deutsche Bodenkundliche Gesellschaft, the oldest and often very active of our national soil science societies, deserve the unqualified praise of the international community of soil scientists for their tireless efforts and convivial hospitality.

It forever erased any lingering bitter memories of the forties when a world war prevented the holding of the fourth Congress (planned for Heidelberg in 1940), and excluded German soil scientist from formal contacts for several years thereafter, with the International Society in organisational jeopardy. The late Dr. D. J. Hissink, Secretary-general from 1924 to 1950, would have been the first to concur that we have come a long way since then! The Hamburg Congress was very definitely a lighting landmark on the way to true international cooperation in soil science and its applications.

W. G. Sombroek

A critical note on research quality

(ad-hoc remarks by the Secretary-general at the Opening Session of the Hamburg Congress)

For lack of regular funds in the academic sphere, intended basic or applied research in and for the tropics and subtropics is often cloaked in a jacket of jargon of technical assistance cooperation. The expected results of a research project should be specified beforehand. One needs to identify target groups in the countries concerned, such as 'the rural poor' or 'small-holder farmers', even though one is aware that the relation between the research project and these people is at best remote. In the process of trying to convince the funding agency of the need for a project, the original research that was already being carried out by local scientists may become obscured. There is also a temptation to bend the final results of a research project towards those that were stated to be expected at the start; it may lead to 'trimming, cooking and forging' of these results. The way things go now, one may be prostituting soil science, and adulterating development aid! Soil research has a political dimension, yes, but ethical behaviour should not be different in soil science from that in other sciences, just because it is so down-to-earth.

We, as a learned society, have to be concerned, more than ever, with scientific honesty; we should promote the idea that soil research, anywhere in the world, has an entitlement to funding in its own right. This implies that we have to become respectable and trustworthy in the academic world. We will have to pull up our socks, strive to improve the quality of our publications, avoid petty squabbling on classification systems or soil fertility testing methods, and be prepared to appreciate the value of soil research published in languages other than our own.

Gatherings like this Congress are the appropriate vehicle to instill and strengthen an attitude of 'honest research in an imperfect world'.

Ref.: 'Honor in Science', Sigma XI, The Scientific Research Society, 1984

REPORT ON THE ISSS COUNCIL

meeting during the 13th International Congress of Soil Science in Hamburg

The Council held 4 sessions. There were about 60 members with voting rights and at times a number of observers.

1) Rules, bye-laws and structure of the Society

The recommendations of the Rules Committee on additional bye-laws, mainly relating to voting procedures for election of Commission officers, were accepted. The details will be printed by the Secretariat to be available in many copies before the next congress.

The Committee was charged with looking into the structure of the society, not adapted for 35 years, notably as regards the unsatisfactory position of subcommissions and some working groups. For this purpose it was renamed *Committee on Statute and Structure* (CSS) with additional membership viz. Pla-Sentis, Goswami, Varallyay, Tinker and El-Swaify (+ Hallsworth, Garbouchev, Schlichting, Dudal, Tavernier, Sombroek).

The provisional *Committee on International Programmes* (CIP) was formalized. It is to assist the SG in promoting ISSS participation in new int. programmes such as IGBP that have, or should have, a soils input. Members are: Scharpenseel (ch), Tinker, Yaalon, Sombroek (secr.), and several more to be identified by the EC.

Council confirmed the Society's representation in several ICSU standing Committees viz. SCOPE-Fournier, CASAFSA-Sombroek, CODATA-Baumgardner, CTS-Hallsworth, COSPAR-Hilwig.

Another standing Committee was created to liaise with the Inter. Standardization Organization (ISO) and more specifically its Technical Committee on 'Soil Quality'.

This Committee will have 11 members, nominated by the 7 Commissions and the 4 Subcommissions. Its name is '*Committee on Standardization*' (CST).

2) On the Officers of the Society

The report of the SG over the past 4 years was approved. Also the report of the Treasurer, after being examined by an ad-hoc Committee on Finance, was accepted. The Council agreed that a limited amount of the Society's funds can be made available to pay for supporting services at the SG and Treasurer's Offices.

There being no other candidates, the present office-holders Dr. W. G. Sombroek, I. Szabolcs and D. Gabriels were declared reappointed, after they had expressed willingness to serve for a new four-year term.

3) Facilities of the Society

The provisional arrangements for the *Fellows Fund* and *Life Membership* were approved, with some further specifications. The scheme on *Cooperating Journals* was approved, too. The selection of four journals, already announced in the bulletin, was confirmed. New entries, or deletion of any of the present ones, will be decided upon at the next congress. Scientific Journals of national Societies are not eligible for the scheme, but will be given prominence in the New Membership list.

A regulation was approved on the processing of any *resolutions* to be adopted by the Congress at its closing sessions.

4) Venue of the next Congress

There were two candidates, Mexico and Japan. Both elaborated on the respective available facilities, the theme, and the programme intended. In two rounds of voting the Council accepted the Japanese proposal, expressing at the same time its grateful-

ness for the Mexican offer, and hoping that a Congress in Latin America may be held soonest after Japan.

The XIV Congress will be held in Kyoto in Augustus 1990, with technical excursions in both Japan and China, the latter to be organised by the Chinese Society.

In accordance with the rules, the Council thereupon accepted the Japanese society's nominations for the new President and vice-President of the International Society, them being:

- Prof. Dr. Akira Tanaka of Sapporo-Hokkaido, as President
- Prof. Dr. Yasuo Takai of Tokyo, as Vice-President.

5) Honorary Membership

The Council accepted the recommendations of the Executive Committee to elect four new Honorary Members. Their names are: Dr. Hans Jenny (USA), Prof. Dr. René Tavernier (Belgium), Dr. S. K. Mukherjee (India) and Dr. Don Kirkham (USA). The Council also requested the CSS to propose an increase in the maximum of Honorary Members that are allowed at any one time.

6) Subcommissions

The activities and plans of the three existing Subcommissions were summarized by their representatives. Pending a restructuring of the Society, their continued functioning was approved.

As regards Subcommission C a proper liaison will be worked out with the World Association of Soil Conservation (WASC) and the International Soil Conservation Organisation (ISCO).

The present and long-functioning Working Group on *Soil Zoology* was upgraded to Subcommission status, in the understanding that their three-year cycle of meetings be changed into a four year one.

7) Working Groups

The mandate of the present WG on *Long-term Soil Fertility Testing* was terminated. The SG is to work out mandate and membership of a new Group operating worldwide rather than exclusively european – and quite a number of members have already expressed interest, with animation of Prof. Agboola (Nigeria).

The Working Groups on *Soil Information Systems* and on *Land Evaluation* consider their respective tasks largely completed. They propose however new joint activities under the heading of a Working Group '*Land Evaluation Information Systems*'. This was accepted by the Council, the new Chairman being Dr. Dumanski (Canada) and Prof. Dr. Zinck (Venezuela-Netherlands) the secretary.

The Working Group on *Desertification* is to continue its work in close liaison with the Desertification Control unit of UNEP. Dr. Dregne (USA) is to continue as chairman, Dr. Rosanov (USSR) as secretary.

The Working Group on *Forest Soils* has not demonstrated significant activities in the past period. Its mandate is therefore terminated, but a new group is to be formed on *Forest-Soil Relationships* that is to give equal attention to the forest-soil problems of temperate and tropical regions, in close liaison with IUFRO. At the Congress already a provisional group of members under Prof. Ulrich (FRG) gathered to discuss activities, and the SG will work out formal arrangements for an amplified mandate and office holders.

The activities of the Working Group *IRB* were reviewed. The new Chairman of Commission V will call a meeting of its steering committee early next year to reformulate its mandate and chairmanship.

The Working Group on *Paleopedology* is to continue as before, with Prof. Yaalon (Israel) as chairman and Dr. Valentine (Canada) as secretary.

The Working Group on *Remote Sensing* is also to continue under its present mandate, with Mr. Hilwig (Netherlands) as chairman and Dr. Guhasz (Hungary) as secretary.

The Working Group on *Soil Colloid Surfaces* will henceforward concentrate on the organisation of summer schools. Prof. de Boodt (Belgium) will be the new chairman and Dr. Hayes (UK) the secretary.

The Working Group on *Engineering Properties of Soils* or *Pedotechnique* will continue, with Dr. Wilson (Canada) as chairman and Mr. Ouwerkerk (Netherlands) as secretary.

The *Acid Sulphate Soils* Working Group also continues, with Prof. Pons (Netherlands) as chairman and Mr. Van Mensfoort (Vietnam) as secretary. The Council hopes that it broadens its scope to related problem soils.

The Working Group on *History, Philosophy and Sociology of Soil Science* will continue as before, with Prof. Yaalon (Israel) as chairman and Dr. Helms (USA) as secretary. Council considers that the subject warrants permanent attention and at restructuring of the society it should be covered by another entity than a Working Group.

The Working Group on 'Moisture Variability of Field Soils' will continue but with a broader field of interest – bringing together Co. I, V and IV – and a less awkward title: *Soil and Moisture variability in time and space*. Dr. Bouma (Netherlands) will be its chairman and Dr. Wagenet (USA) its secretary.

Several proposals for new working groups were considered; some were accepted:

The provisional Working Group on the preparation of a *digitized international soil and terrain map* at 1:1 M accuracy with accompanying data base (SOTER) was formalised, to function until such a project will effectively start. It is hoped and expected that thereafter several of the existing working groups will provide scientific advice for such a major undertaking. Prof. Baumgardner (USA) will be the chairman of the Working Group, and Mr. Van de Weg (Netherlands) secretary.

Soils and Geomedicine is the subject of another new Working Group, chaired by Prof. Låg (Norway), with Prof. Dudal (Belgium) as secretary.

Also a Working Group on *Paddy soils fertility* was established, with Prof. H. Wada (Japan) as chairman.

Prof. Junck (FRG) will chair a new Working Group on *Rhizospere*.

The Items of 'Soil Pollution' and 'Establishment of key soil and vegetation reserves' have been under discussion as warranting special attention, too. The EC may decide to create provisional Working Groups for the purpose in the near future.

8) **Inter-Congress activities 1986–1990:** see list

9) **Resolutions**

a) World Conference. See separate text.

b) First priority to be accorded to Latin America for the XV Congress in 1994.

10) **Results of elections of Commission officers:** see list

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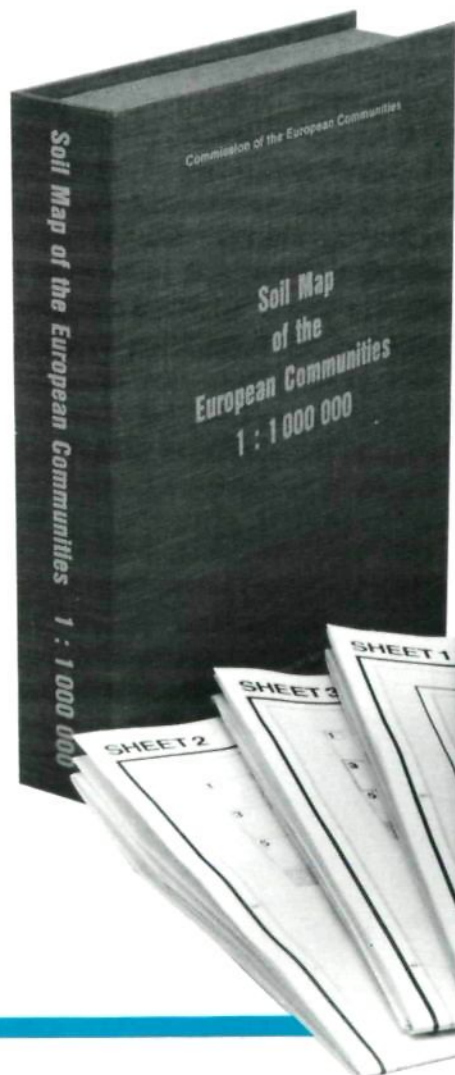
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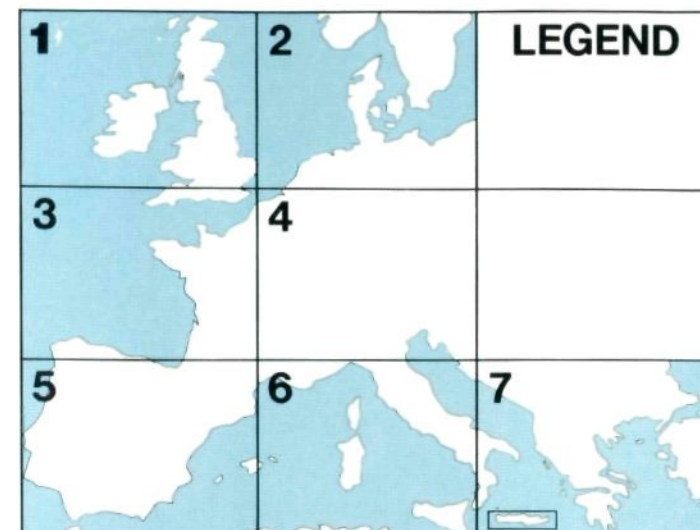
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In 1978 the European Commission decided to publish a standardised soil map of the European Communities member states at a scale of 1:1,000,000. This was achieved by updating material already available from FAO. Thus, this new map represents the culmination of research carried out over more than thirty years by leading European soil scientists. The preparation of the map and accompanying explanatory text was carried out under the supervision of Professor R. Tavernier of the Soil Correlation Centre, University of Ghent.

THE MAP AND LEGEND

The map is presented as seven separate coloured sheets together with two sheets of legend. The legend comprises 312 different map units which consist of associations of soil units

occurring within the limits of a mappable physiographic entity. Each association is composed of a dominant soil and of associated soils, the latter covering at least 10 per cent of the area but less than 50 per cent. Important soils which cover less than 10 per cent of the area are added as inclusions. The textural class of the dominant soil and the slope class are given for each association. Phases are used where indurated layers or hard rock occur at shallow depth or in order to indicate stoniness, salinity, alkalinity, high content of gravels or concretions.

The soil units used are those adopted for the FAO/Unesco Soil Map of the World at scale 1:5,000,000 (FAO, 1974). These soil units were selected on the basis of present knowledge about the formation, characteristics and distribution of the soils covering the earth's surface, their importance as resources for production and their significance as factors of the environment. An attempt was made to establish a common denominator between different soil classification systems, and to combine into one outline the major soil units which have been recognized in the different countries.

In the legend the soil units have been grouped according to generally accepted principles of soil formation.

SOIL MAP OF THE EUROPEAN COMMUNITIES

LEGEND

1:1 000 000

SOIL UNIT	SOIL UNIT	SOIL UNIT	SOIL UNIT	SOIL UNIT	SOIL UNIT
101 C1 C2 C3 C4 C5 C6 C7 C8 C9 C10 C11 C12 C13 C14 C15 C16 C17 C18 C19 C20 C21 C22 C23 C24 C25 C26 C27 C28 C29 C30 C31 C32 C33 C34 C35 C36 C37 C38 C39 C40 C41 C42 C43 C44 C45 C46 C47 C48 C49 C50 C51 C52 C53 C54 C55 C56 C57 C58 C59 C60 C61 C62 C63 C64 C65 C66 C67 C68 C69 C70 C71 C72 C73 C74 C75 C76 C77 C78 C79 C80 C81 C82 C83 C84 C85 C86 C87 C88 C89 C90 C91 C92 C93 C94 C95 C96 C97 C98 C99 C100	102 C101 C102 C103 C104 C105 C106 C107 C108 C109 C110 C111 C112 C113 C114 C115 C116 C117 C118 C119 C120 C121 C122 C123 C124 C125 C126 C127 C128 C129 C130 C131 C132 C133 C134 C135 C136 C137 C138 C139 C140 C141 C142 C143 C144 C145 C146 C147 C148 C149 C150 C151 C152 C153 C154 C155 C156 C157 C158 C159 C160 C161 C162 C163 C164 C165 C166 C167 C168 C169 C170 C171 C172 C173 C174 C175 C176 C177 C178 C179 C180 C181 C182 C183 C184 C185 C186 C187 C188 C189 C190 C191 C192 C193 C194 C195 C196 C197 C198 C199 C200	103 C201 C202 C203 C204 C205 C206 C207 C208 C209 C210 C211 C212 C213 C214 C215 C216 C217 C218 C219 C220 C221 C222 C223 C224 C225 C226 C227 C228 C229 C230 C231 C232 C233 C234 C235 C236 C237 C238 C239 C240 C241 C242 C243 C244 C245 C246 C247 C248 C249 C250 C251 C252 C253 C254 C255 C256 C257 C258 C259 C260 C261 C262 C263 C264 C265 C266 C267 C268 C269 C270 C271 C272 C273 C274 C275 C276 C277 C278 C279 C280 C281 C282 C283 C284 C285 C286 C287 C288 C289 C290 C291 C292 C293 C294 C295 C296 C297 C298 C299 C300	104 C301 C302 C303 C304 C305 C306 C307 C308 C309 C310 C311 C312 C313 C314 C315 C316 C317 C318 C319 C320 C321 C322 C323 C324 C325 C326 C327 C328 C329 C330 C331 C332 C333 C334 C335 C336 C337 C338 C339 C340 C341 C342 C343 C344 C345 C346 C347 C348 C349 C350 C351 C352 C353 C354 C355 C356 C357 C358 C359 C360 C361 C362 C363 C364 C365 C366 C367 C368 C369 C370 C371 C372 C373 C374 C375 C376 C377 C378 C379 C380 C381 C382 C383 C384 C385 C386 C387 C388 C389 C390 C391 C392 C393 C394 C395 C396 C397 C398 C399 C400	105 C401 C402 C403 C404 C405 C406 C407 C408 C409 C410 C411 C412 C413 C414 C415 C416 C417 C418 C419 C420 C421 C422 C423 C424 C425 C426 C427 C428 C429 C430 C431 C432 C433 C434 C435 C436 C437 C438 C439 C440 C441 C442 C443 C444 C445 C446 C447 C448 C449 C450 C451 C452 C453 C454 C455 C456 C457 C458 C459 C460 C461 C462 C463 C464 C465 C466 C467 C468 C469 C470 C471 C472 C473 C474 C475 C476 C477 C478 C479 C480 C481 C482 C483 C484 C485 C486 C487 C488 C489 C490 C491 C492 C493 C494 C495 C496 C497 C498 C499 C500	106 C501 C502 C503 C504 C505 C506 C507 C508 C509 C510 C511 C512 C513 C514 C515 C516 C517 C518 C519 C520 C521 C522 C523 C524 C525 C526 C527 C528 C529 C530 C531 C532 C533 C534 C535 C536 C537 C538 C539 C540 C541 C542 C543 C544 C545 C546 C547 C548 C549 C550 C551 C552 C553 C554 C555 C556 C557 C558 C559 C560 C561 C562 C563 C564 C565 C566 C567 C568 C569 C570 C571 C572 C573 C574 C575 C576 C577 C578 C579 C580 C581 C582 C583 C584 C585 C586 C587 C588 C589 C590 C591 C592 C593 C594 C595 C596 C597 C598 C599 C600

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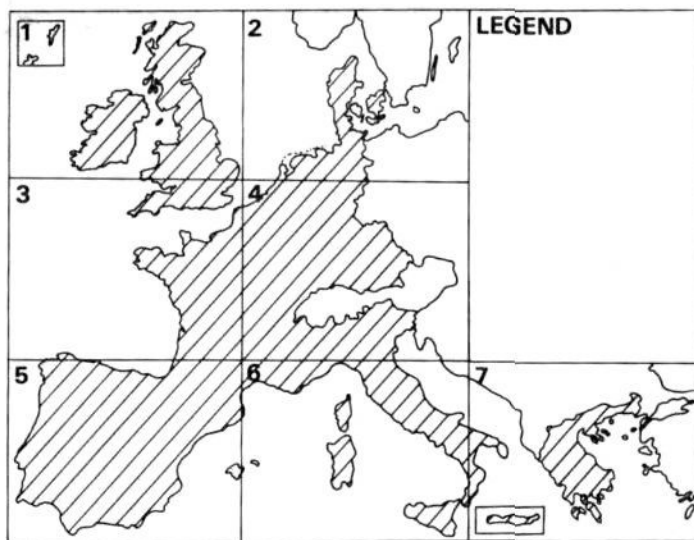
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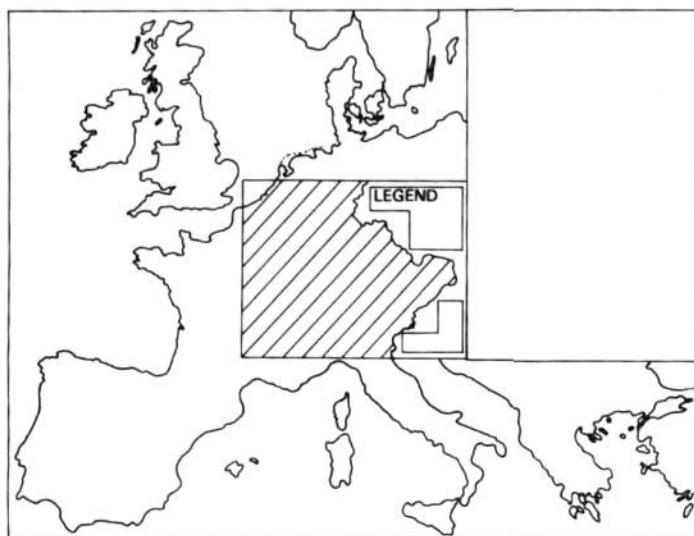
This publication was prepared by the Commission of the European Communities.

The map was compiled and prepared by R. Tavernier and A. Louis of the Geological Institute of Ghent University, Belgium, based on contributions from national soil correlators, the EEC and FAO.

The map is presented as seven sheets with two sheets of legend. The legend comprises each of the 312 map units, which consist of associations of soil units. Each association is composed of a dominant soil and of associated soils and inclusions. The soil units are those adopted for the FAO/Unesco Soil Map of the World.

The accompanying explanatory text of over 120 pages gives details of: the preparation of the map; classification and definitions of soil and map units; climate, geology and vegetation; description of the soil associations; land use suitability; profile descriptions and analytical data.

Maps and text are not sold separately.



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This publication is based upon the above mentioned map, plus the soil maps of Austria and Switzerland, which are not contained in the EEC map.

It was published by the International Society of Soil Science.

It follows the system adopted for the Soil Map of the European Communities.

The explanatory booklet not only contains all of the information in the booklet of the EEC map, but also has a listing of the Austrian and Swiss soil data.

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Le Conseil a tenu quatre sessions. Il y avait environ 60 membres ayant droit de vote, plus quelquefois, un certain nombre d'observateurs.

1) Règlement, règlement additionnel et structure de l'Association

Les recommandations du Comité du Règlement sur le règlement additionnel, ayant principalement trait aux procédures de vote pour l'élection des membres du bureau des Commissions, ont été acceptées. Les détails en seront imprimés par le Secrétariat, de façon à ce que de nombreux exemplaires en soient disponibles avant le prochain congrès.

Le Comité a été chargé d'examiner la structure de l'Association, inchangée depuis 35 ans, particulièrement en ce qui concerne la position peu satisfaisante des Commissions et de certains Groupes de Travail. De ce fait, il a été rebaptisé '*Comité des Statuts et de la Structure*' (CSS), et de nouveaux membres en font partie: Pla-Sentis, Goswami, Varallyay, Tinker et El-Swaify (+ Hallsworth, Garbouchev, Schlichting, Dudal, Tavernier et Sombroek, qui en faisaient déjà partie).

Le Comité sur les Programmes Internationaux (CIP), provisoire jusqu'ici, a pris une forme permanente. Il a pour but d'aider le Secrétaire Général à promouvoir la participation de l'AISS dans de nouveaux programmes internationaux tels que IGBP, qui ont, ou devraient avoir, une relation avec les sols. Ses Membres en sont: Scharpenseel (Pr), Tinker, Yaalon, Sombroek (Secr.), et quelques autres devront être nommés par le Comité Exécutif. Le Conseil a confirmé la représentation de l'Association dans plusieurs Comités permanents de l'ICSU, à savoir: SCOPE-Fournier, CASAFSA-Sombroek, CODATA-Baumgardner, CTS-Hallsworth, COSPAR-Hilwig.

Un autre comité permanent a été créé pour faire la liaison avec l'Organisation Internationale de Standardisation (ISO) et plus particulièrement avec son Comité Technique sur la 'Qualité du Sol'. Ce Comité se composera de 11 membres, nommés par les 7 Commissions et les 4 Sous-Commissions. Son nom est '*Comité sur la Standardisation*' (CST)

2) Membres du Bureau de l'Association

Le rapport du Secrétaire Général sur les quatre dernières années a été approuvé. Le rapport du Trésorier, après avoir été examiné par un Comité des Finances ad-hoc, a également été approuvé. Le Conseil a donné son accord pour qu'un montant limité des fonds de l'Association soit mis à la disposition du Secrétaire Général et du Trésorier pour les dédommager de leurs services.

Du fait qu'il ne s'est présenté aucun autre candidat, les membres actuels Drs. W. G. Sombroek, I. Szabolcs et D. Gabriels, ont été réélus dans leurs fonctions respectives, après qu'ils aient exprimé leur volonté de les prolonger pour une nouvelle période de quatre ans.

3) Facilités de l'Association

Les dispositions provisoires pour les '*Fellow Funds*' et les '*Membres à Vie*' ont été approuvées, avec quelques spécifications supplémentaires. Les dispositions pour les '*Journaux Coopérants*' ont également été approuvées. La sélection de quatre Journaux, déjà mentionnés dans le bulletin, a été confirmée. Le prochain Congrès décidera de l'addition de nouveaux journaux à cette liste, ou de la suppression de ces dispositions pour l'un ou l'autre de ces 4 journaux. Les journaux scientifiques des associations nationales ne rentrent pas en ligne de compte pour ces dispositions, mais seront mentionnées en bonne place dans la nouvelle liste des membres. Une résolution a été prise sur le processus d'adoption des décisions par le Congrès lors de ses sessions de clôture.

4) Lieu du prochain congrès

Deux candidats, à savoir le Mexique et le Japon, s'étaient proposés pour accueillir le prochain congrès. Ces candidatures s'appuyaient sur les facilités disponibles dans leur pays respectif, le thème et le programme proposé. En deux tours de vote, le Conseil a accepté la proposition Japonaise; il a exprimé sa reconnaissance au Mexique pour son offre, ainsi que l'espoir qu'un prochain congrès puisse se tenir en Amérique Latine. Le XIVème Congrès se tiendra à Kyoto en Août 1990, avec des excursions techniques au Japon et en Chine, cette dernière devant être organisée par l'Association chinoise. Conformément au règlement, le Conseil a accepté les noms proposés par l'Association japonaise pour le nouveau Président et le Vice-Président de l'Association Internationale, ceux-ci étant:

- Prof. Dr. Akira Tanaka de Hokkaido-Sapporo, comme Président
- Prof. Dr. Yasuo Takai de Tokyo, comme Vice-Président.

5) Membres Honoraires

Le Conseil a accepté les recommandations du Comité Exécutif pour l'élection de quatre nouveaux Membres Honoraires. Il s'agit de: Dr. Hans Jenny (USA), Prof. Dr. René Tavernier (Belgique), Dr. S. K. Mukherjee (Inde) et Dr. Don Kirkham (USA). Le Conseil a demandé au CSSS de proposer une augmentation du nombre de personnes pouvant être membres honoraires en même temps.

6) Sous-Commissions

Les activités et les projets des trois Sous-Commissions existantes ont été résumés par leurs représentants. En attendant une restructuration de l'Association, la prolongation de leur travail a été approuvée. En ce qui concerne la Sous-Commission C, une liaison adéquate avec l'Association Mondiale pour la Conservation du Sol (WASC) et l'Organisation Internationale pour la Conservation du Sol (ISCO) devra être mise en place. Le Groupe de Travail actuel sur la *Zoologie du Sol*, qui fonctionne depuis longtemps, a été admis au statut de Sous-Commission, ce qui implique qu'il change son cycle de réunions (de tous les 3 ans à tous les 4 ans).

7) Groupes de Travail

Il a été mis fin au mandat du Groupe de Travail *Essais à long terme de fertilité des Sols*. Le Secrétaire Général veut élaborer un mandat pour un nouveau Groupe, qui serait aussi membre, qui travaillerait mondialement plutôt que de se limiter à l'Europe – et bon nombre de membres ont déjà exprimé leur intérêt, avec les encouragements du Prof. Agboola (Nigeria).

Les Groupes de Travail *Information en Pédologie* et *Evaluation des Terres* considèrent leur tâches respectives comme largement accomplies. Cependant, ils proposent de nouvelles activités conjointes pour un Groupe de Travail qui porterait le nom de *Informatique de l'Evaluation des Terres*. Celui-ci a été accepté par le Conseil; le nouveau président en est Dr. Dumanski (Canada) et Prof. Dr. Zinck (Venezuela/Pays-Bas) son secrétaire.

Le Groupe de Travail *Désertification* va poursuivre son travail en étroite liaison avec l'unité 'Contrôle de la désertification du PNUE. Dr. Dregne (USA) en reste le président, et Dr. Rosanov (USSR) le secrétaire

Le Groupe de Travail *Sols Forestiers* n'a pas fait preuve, au cours de ces dernières années, d'activités significatives. Pour cette raison, son mandat prend fin, mais un nouveau Groupe va être formé: *Relations Sol-Forêt*, qui devra prêter autant d'attention aux problèmes sol-forêt dans les régions tempérées que dans les régions tropicales, en étroite liaison avec l'IUFRO. Déjà pendant le congrès, un groupe provisoire de membres, sous la présidence du Prof. Ulrich (RFA), s'est réuni pour discuter des activi-

tés et le Secrétaire Général va prendre des dispositions pour établir un mandat et nommer un bureau.

Les activités du Groupe de Travail *IRB* ont été révisées. Le nouveau président de la Commission V va convoquer l'année prochaine une réunion de son Comité d'organisation pour reformuler son mandat et nommer un nouveau président.

Le Groupe de Travail *Paléopédologie* continue comme précédemment, avec le Prof. Yaalon (Israël) comme président et le Dr. Valentine (Canada) comme secrétaire.

Le Groupe de Travail *Pédologie et Télédétection* continue également sous son mandat actuel, avec Mr. Hilwig (Pays-Bas) comme président et Dr. Juhasz (Hongrie) comme secrétaire.

Le Groupe de Travail *Surface des Colloïdes de Sol* se concentrera dorénavant sur l'organisation de cours d'été. Prof. De Boodt (Belgique) en sera le nouveau président et Dr. Hayes (UK) le secrétaire.

Le Groupe de Travail *Propriétés Constructuelles des Sols* ou *Pédotechnique* poursuit ses activités, avec Dr. Wilson (Canada) comme président et Mr. Ouwerkerk (Pays-Bas) comme secrétaire.

Le Groupe de Travail *Sols Sulfatés Acides* continue également, avec Prof. Pons (Pays-Bas) comme président et Mr. van Mensfoort (Vietnam) comme secrétaire. Le Conseil espère qu'il va élargir son champ d'activités aux sols à problèmes similaires.

Le Groupe de Travail *Histoire, Philosophie et Sociologie de la Science du Sol* continue comme précédemment, Prof. Yaalon (Israël) en étant le président et Dr. Helms



A moment of relaxation, in-between Council Sessions, for the President of ISSS Prof. Dr. K. H. Hintze (r) and its Secretary-General Dr. W. G. Sombroek (l).

(USA) le secrétaire. Le Conseil considère que ce sujet justifie une attention permanente et que, au cours de la restructuration de l'Association, il devra se voir attribuer un autre statut que celui de Groupe de Travail.

Le Groupe de Travail 'Variabilité en humidité des sols sur le terrain' va poursuivre ses activités, mais avec un champ d'intérêt élargi – rassemblant les Commissions I, V et IV – et un titre plus approprié: *Variabilité des Sols et de l'humidité dans le temps et l'espace*. Dr. Bouma (Pays-Bas) en sera le président et Dr. Wagenet (USA) le secrétaire.

Plusieurs propositions pour de nouveaux groupes de travail ont été examinées; quelques-unes ont été adoptées.

Le Groupe de Travail provisoire pour la préparation d'une *Carte numérique internationale des sols et des terrains* au 1 millionième avec les banques de données l'accompagnant (SOTER) a été formalisé, pour fonctionner jusqu'au démarrage d'un tel projet. On espère que, après cela, plusieurs des Groupes de Travail existants fourniront des conseils scientifiques pour une entreprise d'une telle importance. Prof. Baumgardner (USA) sera le président du Groupe de Travail, et Mr. van de Weg (Pays-Bas) son secrétaire.

Sols et géomèdecine est le sujet d'un autre nouveau Groupe de Travail, présidé par le Prof. Låg (Norvège), et avec le Prof. Dudal (Belgique) pour secrétaire.

Un Groupe de Travail sur la *Fertilité des Sols Rizicoles Irrigués* a également vu le jour, avec Prof. H. Wada (Japan) comme président.

Prof. Junck (RFA) présidera un nouveau Groupe de Travail: *Rhizosphère*.

Les questions de 'Pollution des Sols' et 'Etablissement de réserves pour les sols-clefs et la végétation-clef', ont fait l'objet d'une discussion et méritent également une attention particulière. Le Comité Exécutif pourrait décider de créer des Groupes de Travail provisoires pour ces sujets, dans un futur relativement proche.

8) **Activités Inter-Congrès 1986–1990:** Voir Liste

9) **Résolutions**

a) Conférence Mondiale. Voir texte séparé.

b) La priorité pour l'accueil du XVème Congrès en 1994 revient à l'Amérique Latine.

10) **Résultats des élections des membres du bureau des Commissions:** Voir liste.

BERICHT ÜBER DIE ISSS-BEIRATSSITZUNGEN

anlässlich des XIII. Internationalen Bodenkundlichen Kongresses in Hamburg

Der Beirat trat zu vier Sitzungen zusammen, an denen ca. 60 stimmberechtigte Mitglieder und jeweils eine Anzahl von Beobachtern teilnahmen.

1. Satzung, Ausführungbestimmungen, Struktur der Gesellschaft

Die Empfehlung des Satzungskomitees bezüglich weiterer Ausführungbestimmungen besonders im Hinblick auf die Wahl der Kommissionsamtsträger wurden angenommen. Einzelheiten werden vom Sekretariat der Gesellschaft gedruckt und werden rechtzeitig vor dem nächsten Kongreß verfügbar sein.

Das Komitee wurde beauftragt die seit 35 Jahren unveränderte Struktur der Gesellschaft zu untersuchen, speciell im Hinblick auf die nicht befriedigende Position von Subcommissionen und Arbeitsgruppen. Zu diesem Zweck wurde sie umbenannt: *Komitee für Statut und Struktur (CSS)*. Zu den bisherigen Mitgliedern (Hallsworth, Garbouchev, Schlichting, Dudal, Tavernier, Sombroek) wurden hinzu gezählt Pla-Sentis, Goswami, Varallyay, Tinker und El-Swaify.

Das provisorische *Komitee für Internationale Programme (CIP)* wurde bestätigt. Es soll dem Generalsekretär (SG) helfen die Teilnahme der Gesellschaft an internationalen Programmen wie dem IGBP zu verstärken. Mitglieder sind Scharpenseel (Ch), Tinker, Yaalon, Sombroek (Secr.) und einige andere, die durch das Exekutivkomitee zu benennen sind. Der Beirat bestätigte die Vertretung der Gesellschaft in verschiedenen ständigen Komitees der ICSU: SCOPE-Fournier, CASAFSA-Sombroek, CODATA-Baumgardner, CTS-Hallsworth, COSPAR-Hilwig.

Ein weiteres ständiges Komitee wurde gegründet um Verbindung mit der internationalen Standardisierungsorganisation (ISO) vor allem ihrem technischen Komitee 'Bodeneigenschaften' zu verstärken. Das Komitee wird 11 Mitglieder haben, von sieben Kommissionen und 4 Subkommissionen benannt. Der Name ist *Standardisierungskomitee (CST)*.

2. Amtsträger der Gesellschaft

Der Bericht des SG über die vergangenen vier Jahre wurde genehmigt, desgleichen der Bericht des Schatzmeisters nachdem eine hierzu bestellte Prüfungsgruppe die Entlastung beantragt hatte. Der Beirat stimmte zu, daß Schatzmeister und Sekretär in geringem Maße Hilfsdienste bei ihrer Amtsführung aus Mitteln der Gesellschaft bestreiten können.

Da keine weitere Kandidaten gemeldet waren, wurden die Amtsträger Dr. W. G. Sombroek, I. Szabolcs und D. Gabriels für die Ämter des Sekretärs, stellv. Sekretärs und Schatzmeisters wieder gewählt, nachdem sie ihre Bereitschaft erklärt hatten weitere vier Jahre zu arbeiten.

3. Einrichtungen der Gesellschaft

Die provisorischen Einrichtungen *Stipendienfond* und *Ständige Mitgliedschaft* wurde bewilligt, zusammen mit einigen zusätzlichen Spezifikationen. Die Einrichtung *Kooperierende Zeitschriften* wurden ebenfalls gebilligt, desgleichen die Auswahl der vier Journale, die bereits im Bulletin bekannt gemacht wurden. Weitere Aufnahmen oder gegebenenfalls die Beendigung dieses Zustandes sollen auf dem nächsten Kongreß ausgesprochen werden. Die wissenschaftlichen Zeitschriften nationaler Gesellschaften können den Charakter einer kooperierenden Zeitschrift nicht erwerben. Sie werden jedoch in der Mitgliederliste aufgeführt. Für die Annahme von *Resolutionen*, die auf der Abschlußsitzung angenommen werden sollten, wurde ein Verfahren bestätigt.

4. Ort des nächsten Kongresses

Es lagen zwei Kandidaturen vor, Mexico und Japan. Beide präsentierten vor dem Beirat ihre Möglichkeiten, Themen und programmatischen Absichten. In zweimaliger Abstimmung nahm der Beirat den japanischen Vorschlag an, drückte der mexicanischen Delegation seinen Dank aus für die Einladung und die dafür geleistete Arbeit und sprach die Hoffnung aus, daß nach dem Kongreß in Japan der nächste in Lateinamerika stattfinden möge. Der XIV. Kongreß wird in Kyoto im August 1990 abgehalten mit technischen Exkursionen nach Japan und China. Die letzteren werden von der Chinesischen Bodenkundlichen Gesellschaft organisiert. Der Beirat bestätigte hierauf satzungsgemäß die Vorschläge der Japanischen Bodenkundlichen Gesellschaft für den neuen Präsidenten und Vizepräsidenten, nämlich:

- Prof. Dr. Akira Tanaka de Hokkaido-Sapporo, Präsident.
- Prof. Dr. Yasuo Takia de Tokyo, Vice-Präsident.

5. Ehrenmitgliedschaften

Der Beirat bestätigte die Empfehlungen des Exekutivkomitees vier neue Ehrenmit-

glieder zu ernennen. Ihre Namen sind: Dr. Hans Jenny (USA), Prof. Dr. René Tavernier (Belgium), Dr. S. K. Mukherjee (India) et Dr. Don Kirkham (USA). Der Beirat beauftragte das Komitee für Statute und Struktur (CSS) eine Erhöhung der maximal zulässigen Anzahl von Ehrenmitgliedern in der Satzung einzuarbeiten.

6. Subkommissionen

Die Aktivitäten und Pläne der drei existierenden Subkommissionen wurden von ihren Vertretern dargestellt. Unbeschadet der Umorganisation der Gesellschaft wurde ihr weiteres Bestehen beschlossen. Im Hinblick auf die Subkommission C soll eine Zusammenarbeit mit der World Association of Soil Conservation (WASC) und der International Soil Conservation Organisation (ISCO) ausgearbeitet werden. Die seit langem tätige Arbeitsgruppe *Boden-Zoologie* wurde in den status einer Subkommission angehoben unter der Bedingung, daß sie ihren Dreijahres-Turnus auf einen Vierjahres-Turnus umstellt.

7. Arbeitsgruppen (AG)

Die Arbeitsgruppen *Bodenfruchtbarkeit* (FT, Comm. IV) wurde aufgelöst. Der SG wird Aufgabenbereich und Mitglieder einer neuen Arbeitsgruppe formulieren, die weltweit und nicht wie bisher exklusiv europäisch zusammengesetzt sein soll. Etliche Mitglieder haben bereits Interesse bekundet, ermutigt von Prof. Agboola (Nigeria).

Die AG Informationssysteme (DP, Comm. V) und die AG Landbewertung (LE, Comm. VI) betrachten ihre Aufgabe als wesentlich erfüllt. Sie schlagen jedoch vor, ein gemeinsames Programm unter der Überschrift *Landbewertung und Informationssysteme* zu formulieren. Dies wurde vom Beirat angenommen, als neuer Vorsitzender wurde Dr. Dumanski (Kanada) und Prof. Dr. Zinck (Venezuela-Niederlande) als Sekretär benannt.

Die AG *Desertifikation* (DC, Subc. C) wird ihre Tätigkeit in enger Zusammenarbeit mit der Desertifications Controll Unit der UNEP fortsetzen. Dr. Dregne (USA) bleibt Vorsitzender, Dr. Rosanov (USSR) Sekretär.

Die AG Waldböden (FS, Comm. V) hat in der Vergangenheit nicht viel Aktivität aufzuweisen, sie wird deshalb aufgelöst. Statt dessen wird eine neue Gruppe *Wald-Bodenbeziehungen* gebildet, mit der aufgabe gleichermaßen Forst-Boden-probleme der gemäßigten wie der tropischen Zonen in enger Zusammenarbeit mit IUFRO aufzugreifen. Beim Kongreß traf sich eine vorläufige Gruppe unter Prof. Ulrich (BRD) um die ersten Aktivitäten zu besprechen. Der SG wird die Formalitäten, die erweiterte Aufgabe und die Amtsträger benennen.

Über die Tätigkeit der AG *Internationale Referenzbasis für Bodenklassifikation* (IRB, comm. V) wurde berichtet. Der neue Vorsitzende von Kommission V wird ein Komitee einberufen, das zu Beginn des nächsten Jahres Auftrag und vorsitz neu formulieren wird.

Die AG *Paläopedologie* (PP, Comm. V) wird weiter arbeiten, mit Prof. Yaalon (Israel) als Vorsitzender und Dr. Valentine (Kanada) als Sekretär.

Die AG *Fernerkundung* (RS, Comm. V) wird weiter arbeiten, mit unveränderten aufgabenbereich, mit Mr. Hilwig (Niederlande) als Vorsitzender und Dr. Juhasz (Ungarn) als Sekretär.

Die AG *Kolloidale Oberflächen* (CO, Comm. II) wird sich hinfort auf die Organisation von Kurztagungen konzentrieren. Prof. De Boodt (Belgien) wird Vorsitzender, Dr. Hayes (GB) Sekretär.

Die AG *Ziviltechnische Eigenschaften oder Pedotechnik* (PT, Comm. VI) wird weiter arbeiten mit Dr. Wilson (Kanada) als Vorsitzender und Mr. Ouwerkerk (Niederlande) als Sekretär.

Die AG *Saure Sulfatböden* (AS, Comm. V) wird weiterarbeiten mit Prof. Pons (Nie-

derlande) als Vorsitzender und Herr Van Mensfoort (Vietnam) als Sekretär. Der Beirat hofft, daß sie ihren Blickwinkel auf benachbarte Bodenprobleme ausweitet.

Die AG *Geschichte, Philosophie und Soziologie in der bodenkunde* (HP, Comm. V) wird ihre Arbeit fortsetzen, Prof. Yaalon (Israel) als Vorsitzender und Dr. Helms (USA) als Sekretär. Der Beirat stellt fest, daß dieses Thema ständiger Aufmerksamkeit bedarf und daß es bei Umstrukturierung der Gesellschaft durch eine andere Einheit als AG abgedeckt werden sollte.

Die AG Veränderlichkeit des Bodenfeuchtegehalts im Gelände (MV, Comm. I) wird weiter arbeiten mit einem verbreiterten Interessengebiet, das die Kommissionen I, V, und VI zusammenbringt. Sie wird umbenannt: *Boden- und Feuchtigkeitsvariabilität in Raum und Zeit*. Dr. Bouma (Niederlande) wird als Vorsitzender, Dr. Wagenet (USA) als Sekretär tätig sein.

Mehrere Vorschläge wurden verhandelt. Einige wurden akzeptiert:

Die provisorische AG zur *Vorbereitung einer digitalisierten internationalen Boden- und Landkarte 1:1 Mio* mit begleitender Datensammlung (SOTER) wurde formalisiert, sie soll in der bisherigen Form tätig sein bis die tatsächlichen Arbeiten beginnen. Es wird gehofft und erwartet, daß danach mehrere der bestehenden AGs wissenschaftliches Material für dieses Unterfangen beisteuern. Prof. Baumgardner (USA) wird als Vorsitzender, Herr van de Weg (Niederlande) als Sekretär tätig sein.

Böden und Geomedizin ist das Arbeitsgebiet einer anderen neuen Arbeitsgruppe, Vorsitzender Prof. Låg (Norwegen), Sekretär Prof. Dudal (Belgien).

Eine neue AG *Fruchtbarkeit von Reiböden* wurde eingerichtet, Vorsitzender Prof. Wada (Japan).

Eine AG *Rhizosphäre* wurde eingerichtet. Vorsitzender Prof. Junck (BRD).

Die Themenbereiche 'Bodenbelastung' und 'Errichten einer Basis aus boden und Vegetationsdaten' wurde diskutiert und bedarf weiterer aufmerksamer Beobachtung. Ggf. soll das EC eine vorläufige AG zu diesen Themen benennen.

8. Zwischenkongressliche Tätigkeiten 1986–1990: siehe Liste

9. Resolutionen

a. Weltkonferenz: siehe separaten Text.

b. Erste Priorität für den XV. Kongreß 1994 wurde Lateinamerika eingeräumt.

10. Ergebnisse der Wahlen der Kommissionsamtsträger: Siehe Liste.

RESOLUTION XIII ISSS CONGRESS

In recognition of the fact that

- land and soils are finite resources
- increasing demands are being placed on these resources to feed the growing world population to provide ecological balance in the biosphere
- these resources are suffering increasing damage

the XIII ISSS Congress, August 1986, in Hamburg, appeals to the Executive Director of UNEP, the Director General of FAO and the Director General of UNESCO to make jointly a request to the General Assembly of the United Nations that it arranges for the preparing and convening of a

‘WORLD CONFERENCE ON LAND AND SOIL CONSERVATION,
REHABILITATION AND LEGAL PROTECTION’

ISSS OFFICERS, 1986-1990

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	A Salt-affected Soils	B Soil Micromorphology	C Soil Conservation & Environment	D Soil Zoology	Officers:	Prof. Dr. A. Tanaka, Sapporo-Hokkaido, Japan Prof. Dr. K. H. Hartge, FRG; Dr. J. S. Kanwar, India; Dr. C. F. Bentley, Canada Prof. Dr. Y. Takai, Tokyo, Japan Dr W. G. Sombroek, Holland Prof. I. Szabolcs, Hungary Dr. D. Gabriels, Belgium	
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Secretary	M. Adam (Yugoslavia)	Mrs. M. Kooistra (Netherlands)	L. Moncharean (Thailand)	H. Takeda (Japan)	Treasurer:		

Commissions: 3rd Vice-Chairman and Secretary appointed by the Japanese Society, as organiser of the next Congress.

Subcommissions: 3rd Vice-Chairman appointed by the Japanese Society, Secretary appointed by the Society of the country in which the Subcommission will have its main inter-Congress meeting, unless there is already another officer from that country (as per the recommendations of the Committee on Rules).

ADDRESSES OF THE NEW ISSS OFFICERS

(for the names and addresses of the immediate past-Chairmen, see covers of Bulletin 69)

Commission I:

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Dr. T. Miyszaki, Nat. Inst. of Agr. Civil Engineering, 2-1-2, Kannondai, Yatabe, Tsukuba, 305, Japan

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Working Group IRB: pending

Working Group FS: pending

APPROVED INTER-CONGRESS MEETINGS ISSS, 1986-1990

Country and organising Society	Subject	Date	Commission, Subcommittee, Working Group
India	Aforestation of salt-affected soils	Febr. '87	A
Indonesia	Tropical peats and peatlands (International Peat Society)	Febr. '87	co-sponsoring (V + VI)
Netherlands	Vulnerability of soils and groundwater to pollutants (Several Dutch institutions)	March '87	co-sponsoring (I + II)
Australia	Nitrogen cycling in agricultural soils (CSIRO)	May '87	co-sponsoring (III + FT)
Venezuela	10th Latin American Congress of Soil Science	June '87	co-sponsoring
India	Sandy soils amelioration	Nov. '87	VI
Italy	College on soil physics (Int. Centre for Theor. Physics)	Nov. '87	co-sponsoring (I)
Thailand	5th Int. Soil Conservation Conference (Int. Soil Conserv. Org.)	Jan. '88	co-sponsoring (C)
Kenya	Utilisation of soil survey information	Feb. '88	V + VI
India	Classification, management and use potential of swell-shrink soils (NBBS & LUP - Nagpur)	Feb. 88	co-sponsoring (V)

Approved Inter-Congress Meetings of ISSS, 1986-1990 (cont.)

Country and organising Society	Subject	Date	Commission, Subcommittee, Working Group
USA - New Mexico	Measurement and validation of solute transport through the unsaturated zone	May '88	co-sponsoring (MV)
Yugoslavia	Solonchic soils: problems, properties and utilization	June '88	A
Israel	Marginal soils, their management and productivity	June '88	IV + VI (+ V)
USA - Texas	VIIIth Meeting on Soil micromorphology	July '88	B
FRG	Nutrient dynamics of the soil-plant interface (rhizosphere)	mid '88	IV + SR
India	Xth Colloquium on Soil Zoology	Aug. '88	D, with IUBS
Czechoslovakia	Humus et planta IX (Research Inst. for Crop Production, Prague)	Aug. '88	co-sponsoring (II + IV)
USA - Minneapolis	Measurement and validation of soils related to soil tillage and field traffic	Sept. '88	PT + VI
Netherlands	Land qualities in time and space	end '88	MV + LS
Czechoslovakia	Time and space variability of soil hydrological components	end '88	I
Africa & Latin America	Quantitative land evaluation and farming systems for soil conservation	1988?	LS + C, with IBSRAM
Thailand	Paddy soils	1988-1989	PF
Czechoslovakia	Soil conservation and environment	1989	C
Hungary	Remote Sensing for soil survey	1989	RS
France	Rock weathering and soil mineralogy	July '89	VII with AIPEA
Nigeria	1st African Congress of Soil Science	Aug. '89	co-sponsoring
Vietnam	acid sulphate soils	early '90	AS
Japan	14th International Congress of Soil Science	Aug. '90	all

Mid-term meeting (1988) of the ISSS Executive Committee in southeastern USSR or USA.

Dr. Marion L. Jackson, retiring professor of soil science of the University of Wisconsin, USA, was selected to the US National Academy of Science.

Prof. William C. Moldenhauer, retired soil scientist/research leader at the National Soil Erosion Laboratory at West Lafayette, USA, and one of the prime movers of the World Association of Soil Conservation, received the H. H. Bennet award of the Soil Conservation Society of America.

Mr. Graham M. Higgins has been appointed Director of the Land & Water Development Division at FAO, and **Mr. Pieter J. Dieleman** officer-in-charge of its Water Resources Development and Management Service.

**ECHOS FROM THE TOURS OF THE HAMBURG CONGRESS
ECHOS DES EXCURSIONS DU CONGRES DE HAMBOURG
BERICHTE UBER STUDIENREISEN DES HAMBURGER KONGRESZ**

**Tour B: 'LAND OF THE LORELEI': SOILS AND LANDSCAPES AROUND THE
RHINE VALLEY OF GERMANY AND THE NETHERLANDS**

Few places in the world conjure up the sense of history, the romanticism and the sheer throbbing vitality associated with the valley of the River Rhine. Participants in Tour B discovered that these qualities are matched by fascinating pedology and a bounteous and diverse crop productivity. For the 30 participants from 9 countries as different as Burkina-Faso and Australia; Cameroon and New Zealand; Japan and France; USA and China, the 10 days between 2 and 12 August were highly stimulating in a technical sense, and very pleasant to experience. This was due in large part to the care and competence of the tour leader, Professor Horst Weichmann from the University of Bonn, charmingly assisted by Mrs Sabine Horst from the Hansa Tour Agency in Hamburg.

For the first four days the tour was based at Bingen on the banks of the Rhine near Frankfurt. Two nights were spent at the Federal capital of Bonn, prior to travelling to the Netherlands, where two days were based on Wageningen. After one night in Amsterdam the party travelled to Hamburg, where the tour concluded on 11 August.

The programme was carefully planned so as to appeal to the wide range of interests of a diverse group of soil scientists. Each day had a discernible theme and the ready participation and co-operation of the many resource people along the way was greatly appreciated by the tour participants.



Prof. Weichmann explaining pseudogley development to the tour-B group in the Kottenforst forest.

The first day concentrated on viticulture in the Rheingau region in appropriately sunny weather with temperatures reaching 35°C. Such conditions had a suitably dehydrating effect for the evening winetasting at the Institute for Vine Breeding at Geisenheim – birthplace of the famous Muller-Thurgau grape. The winetasting was conducted in inimitable style by the Director of the Institute, Prof. Dr. H. Becker, who has international experience as a viticultural consultant and as an astute student of other cultures. The Antipodean participants were fascinated by his assessment of the Australian rating system for wine quality – ‘Very interesting’, means not very good; ‘Not too bad’, means moderately good; ‘Not *too* bad at all’, means very good.

The second day was centred around the Rheinhessen district and, after a brief interlude on landslides in the Wissburg district, concentrated on mollisols formed on loess, and concluded with a farm visit which emphasised the very mixed nature of the agriculture which includes pastoral farming, arable crops and vineyards.

The third day was spent in the Hunsrück area of the Middle Rhine and was devoted largely to phenomena related to relict, fossil and hydrothermal weathering processes on Mesozoic-Tertiary saprolite, Oligocene gravels and Tertiary quartzite. Dr P. Felix-Henningsen, one of the tour leaders for the day, experienced the near ultimate disaster for a tour leader by arriving at a site to find that, because of a misunderstanding in the timing, the pit to be inspected had just been filled in. His rapid and effective adjustment to this situation earned everyone’s admiration.

On the fourth day the group became real tourists and joined multitudes of other ethnic groups, including a group of Taiwanese travellers and the Australian Swimming Team returning from the British Commonwealth Games in Scotland, and cruised down the River Rhine from Bingen to Koblenz, passing en route the dark, mysterious face of the Lorelei Rock, where hauntingly beautiful Rhine maidens are reputed to abound – none were seen. This historic stretch of river includes what must be the highest concentration of castles in Europe. The day concluded with a journey up the Moselle River, a visit to the pumiceous deposits in the volcanic area of Mayen, and a walking tour of Bonn by night.

The next day was spent in the Flerzheim-Kottenforst-Holzweiler region south-west of Bonn. Forest soils were the theme of the early part of the day and participants were particularly interested to learn more about the damage to forests by acid precipitation. The day concluded with a fascinating demonstration of the amelioration of compacted soils with everything from Lift-Swivel-Arm Looseners to explosives.

Day six was dominated by the totally fascinating visit to the Rheinbraun AG coal mining and land restoration activities in the Rhenish Lignite District, which is situated between Cologne, Dusseldorf and Aachen. This part of the tour was led by Dr G. Heide from the Northrhine-Westphalen Geological Survey and he demonstrated the very high level of sophistication which has been achieved in soil and land restoration after these massive mining operations. The latter part of the day was spent in the Lower Rhine area in the Schüttenstein Forest and Liedern district inspecting podzols, plaggen soils, nitrate translocation and pollution. The evening was spent in travelling to Wageningen in the Netherlands.

The last three days were spent in the Netherlands with two nights in Wageningen, a stimulating soil research centre of global renown, and one at Amsterdam. Highlights of the Dutch part of the tour included the visit to ISRIC in Wageningen where the Director, Dr W. G. Sombroek, and his cheerful and competent staff, provided an evening of conviviality and professional stimulation; a visit to the storm surge barrier at Oosterschelde, the latest in a most remarkable series of engineering assaults on the ocean’s dominance by the Dutch nation; a convincing demonstration of the professional competence of Stiboka – the Netherlands Soil Survey Institute; a fascinating morning in the De Ginkel region inspecting plaggen soils and learning about the farm-

ing difficulties which are induced by very high productivity generating a volume of organic return which the soil system is not able to absorb – a graphic example of the limitations of the soil system at the other end of the production cycle, and a very clear signal for soil scientists as to where research priorities lie in intensively farmed landscapes. After a boat trip on the canals of Amsterdam, and the discovery that most of Amsterdam's cultural attractions are closed on Monday morning, the tour drove off to Hamburg with the participants very satisfied, very stimulated and in a receptive mood for the main Congress sessions.

M. L. Leamy, Lower Hutt, New Zealand

Tour D: UNE REUSSITE: L'EXCURSION APRES-CONGRES, DU NORD AU SUD, À TRAVERS L'ALLEMAGNE

Je suis sûr que tous les participants de cette extraordinaire traversée de l'Allemagne – c'était il y a, déjà, près de 3 mois ... non, c'était hier...! – en gardent un magnifique souvenir. Nous étions 35, dont cinq dames, d'Allemagne, Australie, Canada, Chine, Danemark, Finlande, France, Italie, Tchécoslovaquie, USA... etc.

Cette expédition pédologique en Allemagne fédérale s'est déroulée dans les meilleures conditions: temps très agréable, autocar confortable, chauffeur excellent et souriant, même s'il devait ralentir ou s'arrêter pour nous laisser voir des sols non prévus au programme en bordure de route, repas de bonne qualité – même un pique-nique en forêt – nuits reposantes. Nous avons traversé de nombreux paysages et milieux très divers: des forêts presque sauvages aux zones de culture très modernisées. Nous avons appris, au fil des heures, à en connaître l'histoire et l'évolution religieuse, artistique, sociale, économique, depuis les débuts de notre ère jusqu'à nos jours, grâce à des guides savants, documentés et inlassablement dévoués.

Tous les jours, sauf le premier, consacré à 'dévorer' des kilomètres pour nous rapprocher de notre zone d'étude – personnellement, j'ai quand même pu observer, ce jour-là, un sol de type podzolique dans la forêt de sycomores proche du motel de notre arrêt – nous avons eu plusieurs sols à étudier, et nous étions très bien documentés, même analytiquement, à leur sujet. Ces sols ont été, souvent, podzols, sols podzoliques, sols ocres podzoliques, parfois à pseudogley, ou intergrades à sols bruns acides, mais aussi sols bruns lessivés, sols lessivés à tendance podzolique (sur un tumulus), rendzines, sols bruns calcaires, sols bruns calciques, sols peu évolués, parfois sols polyphasés, polycycliques, tels que sols podzoliques au-dessus de sols lessivés anciens, ou même un ancien sol ferrugineux tropical (Arzberg).

Nous avons pu aussi, tout au long de la route, en observer, plus ou moins vite, de type identique ou autre, sols à pseudogley – pélosols, sols à gley ... etc., mais nous avons traversé une zone de sols chernozémiques, sans malheureusement, pouvoir en admirer aucun.

Dans chaque région, nous avons vu les divers types d'aménagement: forêts, principalement de conifères, parfois de feuillus, comme, en particulier, dans les zones 'montagneuses' de Bavière en bordure de la Tchécoslovaquie, dans le Fichtelgebirge, ou les zones appalachiennes; landes (Lunebourg); cultures et pâturages des plateaux, des zones de pentes, des vallées (Main, Danube); vignobles des côteaux du Main; étangs d'aquaculture de certains pays (Schwarzenfeld).

Les problèmes agronomiques ne manquent pas dans leur mise en valeur. Beaucoup nous ont été expliqués en détail et de façon très documentée.

Citons seulement: les forêts de conifères qui dépérissent dans les collines du nord-est de la Bavière, le Fichtelgebirge, près de Scheenberg etc., soit par suite de la richesse excessive de l'atmosphère en SO₂, soit par suite de pauvreté chimique des sols podzoli-

ques, en particulier en Mg ou de leur déséquilibre en oligo-éléments. On cherche à les améliorer par une fertilisation destinée, d'abord, à restaurer leur activité biologique. L'érosion du sol et les différents modes de lutte nous ont été exposés principalement sur le terrain, par exemple en parcelles d'expérimentation (simulateur de pluie) à la faculté agronomique de Reising. L'utilisation des résidus urbains a longuement retenu notre attention dans la plaine de Munich, ainsi que les problèmes posés par la teneur des sols en certains oligo-éléments.

Tout au long de cette tournée nous avons aussi admiré de nombreux monuments et été sensibilisés à tant de merveilles lors de la traversée de lieux et villes célèbres: Dortmund, Hanovre, Göttingen, Schwinbad et le souvenir de St. Wilfrid-Boniface, Bamberg et sa cathédrale, Bayreuth, l'Opéra de Wagner et son université, Waldsassen, sa cathédrale et son monastère ainsi que ses fabriques de faïence et de porcelaine (comme dans l'Arzberg), Ratisbonne (Regensburg) et Munich et leurs extraordinaires trésors artistiques.

Au souvenir de cette splendide et passionnante excursion nous ne saurions trop exprimer notre reconnaissance à tous nos guides scientifiques, les professeurs et docteurs Bendt, Dietz, Drexler, Fleischmann, Hofmann, Makeschin, Refflueß, Ruckert, Schwertmann, Wilke, Wittmann, Zech, ainsi que, très spécialement à notre animatrice touristique, Mme Ilse Warner qui a su, avec tant de gentillesse, et grâce à sa connaissance approfondie de son pays, nous faire revivre activement tout son passé historique, religieux, social et économique et comprendre son actualité.

George Aubert, Bondy, France

Tour H: RAISED BOGS IN NATURAL AND CULTURAL LANDSCAPES OF GERMANY AND THE NETHERLANDS

Tour H was a 4-day trip with 2 days looking at the cultivation and conservation of raised bogs in Northwest Germany and 2 days looking at Dutch Fen cultivation and polders in the Netherlands.

The tour leader for the first part was Dr. H. Kuntze. He did an excellent job of explaining the soils, landscapes and general area we traveled through. The tour was not restricted to soils which made it all the more interesting. We visited the famous Worpswede painter colony, Peatland Experiment Station (Institute of Soil Technology, part of National Soil Science Institute of Lower Saxony and the Bog Museum and the Emsland-Development project. We were able to see peat soils in the natural state, how peat lands have been developed by 'peasant' peat cutting (little changed from the 18th and 19th centuries). We visited a farm where these activities were taking place. In sharp contrast to this was what is called modern peat farming. Here all the work was mechanized. In both cases, we were able to see how the land was farmed and/or reclaimed after removal of most of the peat. We saw deep cultivation where a meter of peat was being mixed with the sandy material (buried podzol, Spodosol) underlying the peat. The plowing was to about 1.8 meters deep. Layers of sand and peat at about 135 degrees from the horizontal were formed. This German sand-mixed cultivation gave arable land and seeing a pit dug in one of the areas was a real interesting experience. Until you tried to classify the soil that is.

There were seven different stops made during these 2 days as was already stated. All were very interesting and educational.

Once we left Germany and moved to the Netherlands, we changed tour leaders and H. de Bakker was the new one in charge. He also provided us with a running commentary on the areas we travelled through. The first stop in the Netherlands was



Some of the tour-H participants studying ISRIC's soil monolith exhibition.

at the International Training Center for Aerial Survey (ITC). A brief background and work of ITC was presented, and we spent the night there. The next morning, we were back in the field to see soil reclamation in peat areas in the Netherlands. These areas had been drained and soils reclaimed by putting a thin layer of sand mixed with peat over the peat. Subsoiling was also done to break the dense layer in the buried Spodosol. The land was productive but required well managed water tables to reduce oxidation. We proceeded from there to a natural area maintained by the Society for the Preservation of Nature Reserves.

From here it was into the reclaimed areas of the Zuyder Zee. We learned about polder drainage and development. We saw the rapid changes in profiles after drainage. Oxidized colors developed in a few shot years (could be even weeks). We also saw a profile that developed large cracks upon drainage. The cracks remained in the soil even with rewetting. The material had been deposited in water, and the clays had little orientation upon drying the clays became oriented and thus large cracks developed.

We spent the night in Wageningen where we had a chance to learn about and visit The International Soil Reference and Information Center (ISRIC). ISRIC has a very interesting collection of soil monoliths and was a very interesting stop.

The next day we again visited reclaimed peat areas. In this case, areas in which much of the peat had removed and the area was 2–3 meters below sea level. The first stop was to an Experimental farm where different water table levels were maintained to study soil subsidence and drainage. We then visited a lake area and areas where different water levels as long as you tell yourself that the system of dikes will hold and you will not be flooded.

The 4 days went very fast but were well worth the time. The trip was very interesting and stimulating. The two principal tour leaders were thanked, and we appreciated the excellent work they did. Also a word of thanks needs to be expressed to all of their coworkers who prepared the sites and provided much of the background information. We were well taken care of on the trip and all learned a great deal. Along with the information we received on soils we were treated to a lot of interesting cultural information. This made the trip much more interesting. There was much time and hard work done in advance of the trip and all who were involved in this are appreciated.

John Kimble, Lincoln, USA

Tour C: 'THROUGH THE ALPS FROM SWITZERLAND TO AUSTRIA'

The excursion was a joint undertaking by the Swiss Society of Soil Science and the Austrian Society of Soil Science following the conclusion of our Congress in Hamburg. Participants (about 30) came from 16 countries and included members and wives with a broad coverage of disciplines in soil biological and earth sciences.

The pedologists and geomorphologists in the party engaged in spirited discussions at the sites which had been carefully selected, well prepared and oriented specifically for our observation with respect to the sun position on our arrival – such was excellence of the planning and logistics of the organizers. The host speakers at each site had material to present in addition to that afforded in the guidebook (*Mitteilungen der Deutschen Bodenkundlichen Gesellschaft*, Band 48) which provided full and comparable site, profile, field observations and laboratory data for all stops. To eliminate partly the consequences of inclement weather, sets of prepared slides of the profiles had been presented to participants. The organizers also provided other materials including appropriate medication at the occasional cold, rainy and bleak sites.

Peter Lüscher and Othmar Nestroy and their many colleagues of the Swiss and Austrian Soil Science Societies are to be congratulated for their excellence in the preparation and the execution of Excursion C. Some days in the field gave our more mature citizens needed exercise but our tour guide Dorothee Pfeffer had ensured our evening stops were in well-appointed and convivial surroundings.

Several times during the excursion, the party enjoyed Peter Lüscher's eloquent readings from 'A Tramp Abroad' by Mark Twain and these words (as well as Peter's) recalled events which we too had so recently experienced in the Alps. The final evening in Salzburg commenced with a recital of truly delightful chamber music arranged for us by Othmar Nestroy in a magnificent room of the Residence where Mozart himself had performed.

None of the participants will forget the beauty of the Alps nor the skill and good humour of Walter Koch. The townsfolk, villagers, farmers and engineers of the region between them have established a truly remarkable relationship between themselves and environments which may have daunted lesser people and we thoroughly enjoyed our too short time with them.

R. J. Millington, Canberra, Australia



Tour-C participants in higher spheres...

Tour N: SOILS AND LANDSCAPES IN DENMARK AND SWEDEN

The tour of Denmark and southern Sweden demonstrated how different parent materials and different land use have influenced soil development. Land surfaces in the region are rising as a result of isostatic uplift. At the same time sea level is rising as a result of glacial melt. Man has been poised on the brink between these competing forces for much of the 10,000 year history since the glaciers retreated. He has made his mark in a remarkable way by numerous reclamation schemes, some of which go back to pre-historic times.

The record of that struggle is preserved in the soil for those who can read and interpret the record. Fortunately Tour N brought together Prof. N. Kingo Jacobsen, Inst. of Geo-Geography, University of Copenhagen with Prof. Kjeld Rasmussen and Dr. Leif Petersen, Dep. of Chemistry, The Agricultural University of Denmark, Copenhagen, who interpreted the record in a most enthusiastic and contagious manner. From ancient times human activity has been an integral and major factor giving shape to land and directing the path of soil development in the tidal lowlands – and we questioned whether or not some modern conservation efforts to halt or reverse the course of human influence are over-done, or perhaps they ignore a major element of ecosystems completely. In any case land reclamation projects in Denmark and South Sweden have been so extensive and so successful that there is now popular demand that they be discontinued. Perhaps some projects were too catastrophic. It is difficult to imagine that the Danish Navy once anchored in what is now a rich agricultural area of considerable extent; but who is to say which is better land use.

Through contact with farmers we were reminded that agriculture is still more a way of life than an operation based on 'sound' business principles, even in technologically advanced nations. This being the case we should look at soils as parts of social and economic systems. In such systems purely physical and economic considerations may assume secondary roles. As one Danish farmer said, after he discussed the complicated features of managing his reclaimed soils, 'Although we may not make any money, it is an interesting life'.

Technological, sociological and economic factors are at work dramatically shifting land use. Productivity of farm and forest have increased greatly during the past few decades. Food shortage, which was responsible for a mass exodus of people during the last century, has become food surplus. Production ceilings rather than production goals are in place. Agricultural programs and development projects are being diverted to projects with environmental concerns.

All of the disruptions notwithstanding, processes of soil formation and development continue to operate. These processes, emphasizing cycling of elements in forest ecosystems, were illustrated dramatically by the Swedish partners led by Dr. Mats Olsson and Prof. Tryggve Troedsson, Inst. of Forest Soil Science, Agricultural University of Sweden, Uppsala. Nutrient load in subsoils solutions is extremely low with aluminium being almost the sole cation in solution.

Much of southwestern Sweden, which cultivation, grazing and repeated burning of ground vegetation had converted from forest to a Calluna-heath landscape, has returned to forest. Now the podzolization process has again developed a distinct bleached horizon during one generation of spruce. Fifty years of agriculture in Skane has increased depth to free lime in calcareous soil materials by 10 cm. The productivity of forest land in general has doubled during the past century. One possible factor in both that seems to have been understudied is increased plant nutrient load of precipitation.

Robert L. Fox, Univ. of Hawaii, USA



Prof. Dr. Akira TANAKA, new President of the International Society of Soil Science, 1986–1990

Prof. Tanaka was born in Nagasaki, Japan on September 18th, 1924. He studied agricultural Chemistry at Faculty of Agriculture, Hokkaido University in Sapporo, where he obtained D Agr. on the basis of his research on the nutritio-physiology of leaves of rice plants. At the same University, he started his scientific career, and became Professor of Plant Nutrition in 1967. He was a research fellow at the Central Rice Research Institute in India (1955–1957), and Plant Physiologist of the International Rice Research Institute (IRRI) in the Philippines (1962–1966). He visited CIMMYT, CIAT, IITA, AVRDC, Institute of Soil Science of Academia

Sinica, etc. frequently in connection with joint research programs or as advisor, and was a TAC member of CGIAR (1981–1985).

He was President of Japanese Society of Soil Science and Plant Nutrition (1980–1982), Editor-in-Chief of 'Soil Science and Plant Nutrition' (1974–1976, 1986–1988), and a consulting editor of 'Soil Science' (1965–1973). He served as Vice-Chairman of the Organizing Committee of Intern. Seminar on Soil Environment and Fertility Management in Intensive Agriculture (Comm. IV, ISSS), Tokyo 1977.

Prof. Tanaka published many articles on plant nutrition and soil fertility in scientific journals and proceedings of symposiums, and was awarded the Prize of Japanese Society of Agricultural Sciences (1975), the Prize of Japan Academy of Sciences (1975). He is Corresponding Member of the American Society of Plant Physiologists.



Prof. Dr. Yasuo TAKAI, new Vice President, of the International Society of Soil Science, 1986–1990

Professor Takai was born in Himeji, Japan, on April 10, 1924. He graduated in 1974 in Agricultural Chemistry from the University of Tokyo, where in 1961 he earned his Doctorate in Agriculture on the basis of his research work during the 1950's on the microbial metabolism of paddy soils.

Professor Takai began his career at the University of Tokyo in 1948, moving to Nagoya University in 1953. From 1968 to 1985, he held the position of Professor of Soil Science in the Faculty of Agriculture, the University of Tokyo, and in 1985 received his nomination as Emeritus Professor of the said university. Since

1985 he has had the position of Professor of Nodai Research Institute, Tokyo.

He was a research fellow at the Research Institute of Microbiology, Praha (1965–1966), and at the International Rice Research Institute in the Philippines (1972). Since 1977 he has coordinated several cooperative researches on tropical soil improvement with Thai scientists, and in 1985 was awarded an honorary doctoral degree from Khon Kaen University, Thailand, for his contribution.

He was Vice President (1974–1976) and President (1982–1984) of the Japanese Society of Soil Science and Plant Nutrition. He currently serves as a University Commissioner for Agricultural Education (1976–), a member of the Central Council for Environmental Pollution Control, the Prime Minister's Office (1979–) and Chairman of Unesco's Japanese 'Man and the Biosphere' Programme Coordinating Committee.

For his research work in soil science, Prof. Takai was awarded the Prize of the Japanese Society of Soil and Manures in 1960, and the Agronomy Prize in 1980.

THE FOUR NEW HONORARY MEMBERS OF ISSS

Prof. René Tavernier ('Tav')

Prof. R. Tavernier was born in Nevele, Belgium in 1914. He obtained his PhD degree at the University of Ghent State on Geology and Mineralogy in 1940 and was made Professor of Physical Geography and Regional Pedology at the same University in 1948. In 1947 he was appointed to the post of Director of the Belgian Soil Survey.

In 1950 he was selected President of the International Society of Soil Science and under his leadership the V. Congress of ISSS was held in Leopoldville – now Kinshasa – in 1954.

In 1963 he established the 'International Training Centre for Postgraduate Soil Scientists' in Ghent and served as its Director. His particular line is the classification and diagnostics of soils and he has been actively engaged in the elaboration of most of the modern soil classification and taxonomic systems. He travelled in most countries of the world and obtained a wide knowledge of practically all soil types.

Prof. Tavernier is officer and honorary member of many Belgian and foreign Academies and Societies, and he has the interests of ISSS always closely at heart.

Prof. Don Kirkham

Prof. Emeritus of Iowa State University Don Kirkham was born in 1908 in Provo, Utah-USA. He obtained his A.B. degree at Columbia University in 1934, and his Ph. degree in 1938 in Physics. From 1938 to 1940 he was assistant professor at Utah State University, and was appointed professor in Agronomy and Soil Physics in 1949. He served as Director of the Iowa State Water Research Institute from 1964 to 1973. He is a distinguished scientist in the field of soil physics, author of nearly 230 journal articles and his book, 'Advanced Soil Physics' is a major handbook in our science.

After his retirement he continued as Professor Emeritus to carry on a full programme of teaching and research. During all his professional carrier he has fulfilled professional commitments in many other countries and in international organizations. Both his professional and human character, his interest in culture and music contributed to his broad popularity.

Prof. Hans Jenny

Prof. Hans Jenny is one of the most distinguished veterans in contemporary soil science. He was born in Switzerland in 1899 and studied degree at the College of Agriculture of the Federal Institute of Technology in Zürich, where he also obtained his doctor degree.

Under the guidance of Prof. Marbut and Waksman he got acquainted with the soils and soil problems of USA and joined the University of California in 1936, where he was active until his retirement in 1969. Since that time as professor emeritus, he wrote several books. His particular line is pedology and soil fertility, however his interest covers many other branches of soil science too.

His books such as 'Factors of Soil Formation', 'Hilgard and the birth of modern soil science' and other were published, in english and several other languages. His merit in Soil Science has historical significance.

Prof. Dr. S. K. Mukherjee

Prof. Mukherjee was born in 1914 in Barisal (nowadays Bangladesh). He obtained his Master's degree from the University of Calcutta in 1936 and in 1939 he joined the group of soil chemists working in the field of electrochemistry of soils at Calcutta University. Here he received the degree of Doctor of Science in 1945. In 1968 he became the Vice-Chancellor of the Kalyani University. Back to Calcutta he joined the Bosa

Research Institute as director. Within a year he became the Vice-Chancellor of the University of Calcutta and continued till this retirement in 1978.

In spite of his extended activities of Government service Dr. Mukherjee developed the research in the field of electrochemistry of colloidal systems in soils, with particular regard to clays and humic substances. His theoretical and methodical achievements are highly appreciated in different areas of the world. He is a fellow of the Indian National Academy and Honorary Secretary of Indian Chemical Society. He has been teacher of several generations of soil scientists both in India and abroad.

POSTER AWARDING AT THE HAMBURG CONGRESS

Commission I:

Souty, N. (France)

'Aspects mécaniques de la croissance des racines'.

Commission II:

McLeod, S. (Australia)

'A micro distillation unit for use in flow-through systems for the determination of Nitrogen'.

Commission III:

S. Kanazawa, S. (Japan)

'Seasonal changes of the numbers, biomass and activities of microorganisms in paddy soils under different fertilizer management'.

Commission IV:

Rendig, V. V.; M. B. Jones, D. M. Center, G. Besga and L. Domingo (USA)

'Interactions of sulfur and selenium in forage nutrition and utilisation'.

and

Fox R. L.; R. C. Jones, R. A. Lower and R. S. De la Pena (USA)

'Immediate and residual effects of phosphate fertilizers in relation to tropical soil mineralogy'.

Commission V:

West, L. T., L. P. Wilding, L. R. Drees and M. C. Rabenhorst (USA)

'Differentiation of pedogenic and lithogenic carbonate forms in the southwestern US' and

Ugolini F. C. and R. A. Dahlgren (USA)

'A new theory on podzolisation and synthesis of imogolite/allophane'.

Commission VI:

Kooistra, M. J., J. Bouma and O. H. Boersma (Netherlands)

'Soil structure differences as a function of tillage practises'.

Commission VII

Boero W. and U. Schwertmann (FRG)

'Occurrence and transformation of iron oxides in a colluvial terra rossa toposequence in northern Italy'.

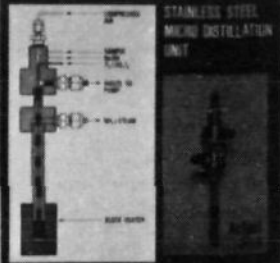
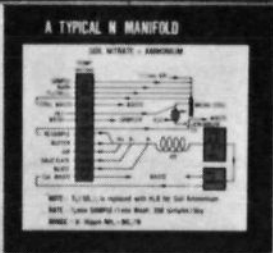
note:

Subcommissions' poster awards will be given at their own inter-Congress meetings. In all cases the choosen posters will be mentioned in a honours list of the ISSS Bulletin.

A MICRO DISTILLATION UNIT FOR USE IN FLOW THROUGH SYSTEMS FOR THE DETERMINATION OF NITROGEN....

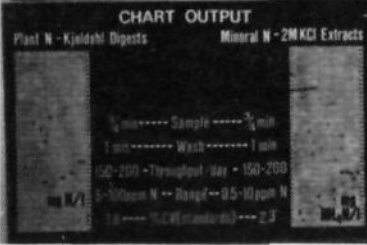


S. McLeod CSIRO Division of Soils ADELAIDE S.A. AUSTRALIA



Advantages of Auto-Distillation

- Essentially interference free
- Requires only a small aliquot of solution
- Any solution may be analysed without matrix effect
- Rapid precise determinations - up to 200 samples/day



NH₄-N METHODS FOR COMPARISON OF C.E.C.

Soil No.	USDA 1.5M% ^a	MICRO STILL 1.5M% ^b	DIRECT 1.5M% ^c
1	6.8	6.7	7.4
2	6.8	6.9	6.8
3	6.7	6.4	6.8
4	2.7	2.4	4.1
5	1.2	1.2	1.4
6	1.9	16.8	3.0
7	2.9	3.4	3.3
8	2.7	6.8	7.8

USDA Manual Distillation of whole soil followed by Titration
 Micro Distillation of an Aliquot on Auto-Analyser
 Direct Auto-Analysis without distillation step

Evaluating Posters.... (based on notes by R. Arnold at Hamburg Congress)

For each item listed, assign a value of 1 to 10 with 10 being the best. The total value is 100 points.

A. Perception of presentation

1. How *attractive* is the poster? Is it orderly, neat, makes good use of color and materials?
2. How good is the blend/*mix* of text and graphics (photos, maps, graphs) and do they seem to be relevant to the subject?
3. Is the *amount of material* appropriate? Is there too little or too much for an effective presentation?
4. How *easy* is it to obtain and comprehend the information being presented?

B. What you learn

5. Why was the study done? Is the *purpose* of the work clearly stated? (hypothesis, or base line data, or a problem)
6. How clear and *logical* is the poster presentation for methods and results? Is it easy to follow the presentation?
7. How well do the *graphics* support and supplement the text? Are they relevant and easy to interpret?
8. Do the results contribute significantly to *knowledge* in the field of endeavor?

C. General

9. How well does this poster represent an application of the *scientific method* to problem solving?
10. Did you like the *quality* of the poster? Does it need a little or a lot of help to improve it as a professional contribution?

ADVICE ON THE PREPARATION OF A POSTER PRESENTATION

1. Keep illustrative material simple. Most scientists will not want to read a large amount of detailed material – they would rather discuss the poster with you. Try out your poster on colleagues before you bring it to the Congress.
2. Provide a simple summary or abstract.
3. The poster should have an *introduction*, providing background to the issue presented, a presentation of *results* of field or laboratory investigations, and a *discussion* of the significance of these results.
4. The introduction should provide enough information for the non-specialist to understand the purpose of the study.
5. In general, as few results as possible should be included, just those necessary to validate the conclusions. A poster overloaded with results will rarely attract attention. There should be simple links between tables, illustrations and text.
6. The discussion will have most impact if it focusses on one or two key issues, with a few easily remembered key conclusions.
7. All lettering of titles should be large enough to catch attention, and text should be large enough to read easily from a distance of about 2 m (6'). Letter should be at least 1 cm high – do NOT use normal typescript. No table should have more than 16 items. No graph should have more than 3 curves, and each should be clearly labelled. All maps and diagrams should be clearly labelled and have a brief title. *Keep the presentation simple!*

ADVICE ON THE PREPARATION OF LECTURE SLIDES

1. Use one slide for each main piece of information or idea. Each slide should convey a simple significant message.
2. Use several simple slides rather than one complicated one.
3. Use duplicates if the same slide is referred to several times in a talk.
4. Plan your slides carefully to complement your oral presentation. Do not leave an irrelevant slide on the screen while you are talking.
5. Be sure that slides from the field clearly show the features that you wish to illustrate.
6. A slide will be legible when projected in a large room *if you can read all the information on the slide with the unaided eye*. This means lettering at least 5 mm high, and line widths at least 1 mm, if the original is 20 cm by 12 cm in size.
7. Do not clutter a slide; do not show more than 20 to 25 words on a slide. Use the space efficiently.
8. Prepare and check your slides in good time before travelling to the Congress. Carry your slides: do not send them in checked baggage.
9. Place a numbered thumb spot on each slide in the lower left corner when the slide reads correctly on hand viewing.

ADVICE ON THE PREPARATION OF AN ORAL PRESENTATION

1. Good talks are simple. They convincingly present a few conclusions. They do not tell the audience everything that the author knows about a subject. They are well-focussed and avoid details that distract from the main conclusions.
2. Be sure that the audience understands your terminology. Remember that in an international conference many in the audience may be unfamiliar with your local geography, stratigraphic terminology and even methodology. They may find language with a lot of slang terms, idiomatic terminology or jargon difficult to understand.
3. Make sure that your talk (and abstract) is arranged in a logical sequence.
4. Emphasise the *interpretation* of, rather than the *presentation* of data. Anyone that has the specialist knowledge to question the data can do so after the talk. Few listeners will be interested in or remember long lists or intricate details of outcrops.
5. Do not assume that the audience has read your abstract, but do follow the abstract so that those who have difficulty following your oral presentation have something to relate to.
6. An oral presentation should have a *brief* introduction that sets the stage and provides perspectives on the problem. It should be followed by descriptive information and an interpretation of this information. Finally, the conclusions (not more than five) should be summarised.
7. Each point in the talk should be illustrated by a slide; but large numbers of slides designed, for example, to show the character of an outcrop, or the variability of a fossil should be avoided. The audience should have time to understand each slide; if less time provided omit the slide. In general, a 15 minute talk should use 15 slides.
8. You must know your talk well. You must have practised it before hand, and you must be certain that it fits into the allocated 15 minutes.

(from: Guidelines INQUA 1987)

**REPORTS OF MEETINGS
COMPTES-RENDUS DE RÉUNIONS
BERICHTE VON TAGUNGEN**

It is gratifying to note that the holding of the 13th Congress of Soil Science in the Federal Republic of Germany has led to the organising of several specialist meetings just before and just after the Congress in neighbouring countries, for instance:

- on humic substances in Oslo, Norway
- on plant and soil interactions in Wageningen, Holland
- on potassium fertilizers in Reims, France
- on soil colloid-soil solution interfaces in Gent, Belgium
- on soil laboratory methods and sample exchange in Wageningen, Holland
- on microbial ecology in Ljubljana, Yugoslavia
- on phosphorus chemistry in Bonn, and Lodz, Poland

Such satellite meetings imply an efficient use of funds for international travel and of specialists' time. One would hope that a similar development will take place as regards the combination of scientific and programme-oriented meeting in tropical and subtropical regions in-between our Congresses. In the recent past some ISSS inter-Congress symposia in these regions had to compete - for funds, specialists' manpower, participants time and publication channels, - with development-oriented soil programmes as sponsored by international research centres and bilateral cooperation entities.

It is hoped that representatives of such programmes will get in contact with national societies and with officers of the various ISSS Commissions and Working Groups, with a view to synchronise intended meetings - trying to have them coincide or to conveniently follow each other in time and venue.

Such development-oriented groups may want to co-sponsor ISSS meetings, and on the other hand ISSS will certainly be prepared to co-sponsor or provide publicity to initiatives from such groups - in both cases with due reference to the initiators. □

INTERNATIONAL SYMPOSIUM. 'PLANT AND SOIL: INTERFACES AND INTERACTIONS'

Wageningen, The Netherlands, August 6-8, 1986

Sponsored by the Agricultural University, Wageningen, Netherland Fertilizer Institut (NMI), The Hague and Martinus Nijhoff/Dr. W. Junk Publishers, Dordrecht; organized by the Editors and Publishers of Plant and Soil, under the coordination of Prof. A. van Diest, this Symposium was held to celebrate the forthcoming of the 100th volume of *Plant and Soil*.

The opening address was by Dr. F. W. B. van Eysinga, President of the Kluwer Academic Publishers Group. About one hundred participants attended the symposium and the twenty nine papers presented were grouped into five working sessions whose names and presidents were: *plant nutrition*: S. Dasberg, Volcani Center, Bet Dagan, Israel; *soil fertility*: S. K. de Datta, IRRI, Manila, Philippines; *biological nitrogen fixation*: R. O. D. Dixon, University of Edinburgh, Edinburgh, Scotland; *soil biology*: R. Rodriguez-Kabana, Auburn University, Auburn, Alabama, USA; *root activities and hydrology*: M. A. El Sharkawy, CIAT, Cali, Colombia.

At the end of every working session one evaluation was made by its president. The conferencists were outstanding scientists on the presented subjects. The closing address was by Prof. A. van Diest.

There was a welcome party at the ISRIC (International Soil Reference and Information Centre), a trip to visit the Kroller-Möller and Tile Museums and a farewell dinner at the IAC (International Agricultural Centre) where the Symposium was held.

All papers will be published in a special issue of *Plant and Soil*.

J. M. Valadares, Campinas, Brazil

INTERNATIONAL MEETING ON HUMIC SUBSTANCES

The 3rd International Humic Substances Society (IHSS) Meeting was held in Oslo, Norway, from the 3rd to 8th of August, 1986, under the auspices of the Norwegian Institute for Water Research and some other Norwegian institutions. About 140 scientists working on humic substances in such diverse fields as soil science, limnology, oceanography, geochemistry, public health and environmental science, got together from 22 countries. Altogether 40 papers, both invitational and voluntary, were read and about 80 posters were presented under the following 3 general headings:

1. Marine humic substances,
2. Biochemistry/biology of humic substances, and
3. Applied research in humic substances.

Besides the ever-important topics as structural as well as functional characterization of humic substances and their formation-decomposition dynamics, a particular concern was paid to the humic-inorganic and humic-organic interactions of environmental significance.

Since the time of its inauguration in 1982, IHSS has been striving for the standardization of the methods of extraction and analysis of humic substances of various origins. At this meeting it was reported that the Society had made 14 standard and 8 reference samples from soils, peats, fresh as well as marine waters available for distribution (of course, at cost) to serve to the purpose of standardization. This would, no doubt, promote further advancement of humic substances research in the coming years.

IHSS will meet again most probably in Spain in 1988 and in Japan in 1990, the latter being coincident with the year of the ISSS congress to be held in Kyoto.

Kazutake Kyuma, Kyoto, Japan



Growing interest in Humic Substances!

13th CONGRESS OF THE INTERNATIONAL POTASH INSTITUTE
Reims, France, August 25–28, 1986

The Congress, sponsored by the International Potash Institut, was attended by about 230 participants from 45 countries. It was organized as a conclusion of a 4 years working cycle over the overall theme 'Nutrient balances and fertilizer needs in various climatic areas'. Three colloquia had been held before in the arid-semiarid zone (Rabat-Marakesh, Morocco, 1983), the temperate zone (Gardone, Italy, 1984) and in the humid tropics (Bangkok, Thailand, 1985).

Twenty papers were presented by invited speakers, within a general framework of 'Nutrient balances and the need for potassium' and divided in the following sessions:

- NPK nutrient balances in different climatic regions and production systems based on IPI – Colloquia 1983–1985;
- Important factors in potassium balance sheets;
- Changing production targets and techniques and their effects on the potassium balance sheet;
- Potassium fertilization to maintain a K-balance under various farming systems;
- Investing in soil fertility to insure the future.

Complementary to the sessions two technical excursions were made in the Champagne region.

The papers presented will be published in the Congress Proceedings, which will contain also the conclusive reports of the Congress chairman and of the session coordinators.

Bernardo van Raij, Campinas, Brazil

INTERNATIONAL WORKSHOP ON THE QUALITY OF SOIL ANALYSIS
Wageningen, the Netherlands, 25 to 29th of August 1986

An international workshop on inter-laboratory cross-checking of soil analytical data was held at the International Agricultural Center in Wageningen. The event was prepared and organized by the executive secretary of the Laboratory Exchange Programme (LABEX) project of the International Soil Reference and Information Centre (ISRIC), ir. L. K. Pleijsier, whose methodic work has contributed considerably to the success of the event.

The sixty-one participants from 32 countries, from all continents, discussed specific problems in soil analysis, as the determination of the cation exchange capacity of soils with traditional and modern methods as using Li-EDTA, cobalt hexamine or others, the methodology for organic carbon determination in soils and other important techniques in soil analysis. Other sessions were dedicated to papers presented by the visiting scientists and collaborators of Wageningen Agricultural University and to discussions on general topics as the sources of analytical variability in soil chemical analysis or the functioning of interlaboratory cross-checking programs in various countries.

Many common problems were identified by the participating scientists most of whom collaborate with the LABEX soil sample exchange program. Useful recommendations were exchanged between the participants based on their variable experience in the individual laboratories.

It was suggested that the samples sent to the participating laboratories should be analysed carefully so as to allow their use as standard samples. The participants also discussed the usefulness of an international program in soil analysis as the one organized and conducted by LABEX.

It was concluded, that this type of program, as that organized by LABEX is highly

beneficial, not only for soil laboratories in developing countries but also for those in industrialized countries.

It was recommended that the program organized by LABEX should be continued on a similar line as it is working now and that it should include determinations more related to soil fertility evaluation. It was suggested that this line should be related principally to the quality of laboratory Society of Soil Science that the project should be given the status of a provisional working group, whose results could be presented at a session of the next Congress of the Society in Japan.

E. Bornemisza, University of Costa Rica

Report on the
INTERNATIONAL CONFERENCE ON THE MANAGEMENT AND
FERTILIZATION OF UPLAND SOILS
Nanjing, People's Republic of China, 7-11 September, 1986.

This third major international soils conference in the People's Republic of China was organized by the Academia Sinica and the Ministry of Agriculture, Animal Husbandry and Fisheries with support from various international agencies, many of which related to the fertilizer industry. Delegates representing 37 countries discussed recent developments in the management and fertilization of upland soils, which still are insufficiently productive in China as well as in many other areas of the tropics and subtropics.

The Conference provided an ideal opportunity for Chinese soil scientists to exchange views and scientific data with scientists from abroad, and also for these foreign scientists to become familiar with the Chinese approaches and methodologies to rehabilitate and maintain agricultural production in non-irrigated agriculture. During six sessions, each of which concentrating on a specific aspect such as the nutrient status and fertilization of upland soils, their management and their characterization, this cross-fertilization between Chinese scientists and their foreign counterparts took place in the form of animated discussions during and in between the sessions.

Two post-conference tours, one of them leading through upland farming systems, mostly on Acrisols, Ustisols and Ferralsols/Oxisols in S.E. China and the other in N. China, provided further opportunities to observe the Chinese approach to upland farming on-the-spot, and to see the effects of large quantities of organic manure and moderate fertilizer applications on the improvement and maintenance of soil fertility.

At the end of the Conference, a set of resolutions was adopted and priority areas of research in upland cropping were identified. It was agreed that the reduction of farmers' risk and the improvement of soil fertility were among the most important research topics in this respect.

The Organization Committee of the first International Conference on the Management and Fertilization of Upland Soils (ICMFUS) in the People's Republic of China deserve a lot of credit for the perfect organization of the Conference and the post-conference tours. The Proceedings of the Conference will be published shortly.

Jan van der Heide, Haren, the Netherlands

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

Information on the programmes of activities of the various Commissions, Sub-commissions and (new) Working Groups will be printed in the next Bulletin. It will also contain a number of announcements of ISSS-inter Congress meetings. The officers concerned are requested to provide the relevant texts and notices-of-intent to the Secretariat, preferably on a format that is suitable for one-page printing (see earlier Bulletins for examples). □

Commission V reports...

Commission V of the International Society of Soil Science was very active and well represented at the Hamburg Congress. Our plenary speaker was Dr. Rudy Dudal who offered a number of challenges in his presentation, 'The role of pedology in meeting the increasing demands on soils'. I hope that many of you will read and re-read his stimulating remarks.

Our Commission symposium on 'Using pedological information to better understand demands on soils' presented five different aspects of our discipline. Three joint symposia were held; one with IBSNAT, one with Comm. VII, and another with Comm. III, VI, and the USSR Society.

Forty-nine papers were presented in the 9 Voluntary sessions and covered the breadth of interests of our Commission dealing with current aspects of genesis, classification, mapping, and numerous methods and evaluations of interpretations.

A new feature of this Congress was the presentation of posters. There were four sessions in which eighty-eight posters covered many aspects of pedology. Two posters were selected by the judges for special recognition. They were:

'Differentiation of pedogenic and lithogenic carbonate forms in the southwestern U.S.' by L. T. West, L. R. Drees, L. P. Wilding and M. C. Rabenhorst of the United States, and 'A new theory on podzolization and synthesis of imogolite/allophane' by F. C. Ugolini and R. A. Dahlgren of the United States.

Several additional very fine posters were:

'Pedogenesis and soil erosion during younger Holocene in southern Lower Saxony in West Germany' by H. R. Bork of the Federal Republic of Germany.

'Alpine soil development and distributions, southern Rocky Mountains, USA' by S. F. Burns of the United States.

'Genesis and classification of clay soils from Saskatchewan, Canada' by G. S. Dasog, D. F. Acton, and A. R. Mermut of Canada.

and 'Soils of serpentized areas, their ecology and distribution' by B. A. Roberts of Canada.

There was a lot of interest in the affairs of our Commission, ranging from activities of the Working Groups to comradeship at sessions and the quiet moments chatting in the halls or over a meal. We had six qualified candidates for officers and our congratulations to Alain Ruellan, our new chairman and to Hari Eswaran and Boris Rosanov our new vice chairmen. The next four years will be well guided by these capable members of our commission. More than 250 votes were cast in our elections.

A concern for the next Congress. Only 79% of the voluntary papers and of the admitted posters were presented at the Congress. I hope our record is better in Kyoto.

Dr. Richard W. Arnold, Past Chairman, Comm. V.

NEWS FROM THE NATIONAL AND REGIONAL SOCIETIES
NOUVELLES DES ASSOCIATIONS NATIONALES ET REGIONALES
BERICHTE DER NATIONALEN UND REGIONALEN GESELLSCHAFTEN

Formation of an African Soil Science Society (ASSS)

At the Hamburg Congress, a well-attended caucus of participating soil scientists from Africa decided to form an African Society. Sixty-six persons signed at-the-spot to become members and paid an initial fee of US\$ 5,-.

An interim Executive Committee was set up, with representation from nine African countries (Burkina-Faso, Cameroon, Egypt, Ethiopia, Ghana, Nigeria, Sudan, Uganda and Zambia). Prof. A. A. Agboola of Nigeria is acting as its Chairman, and Dr. D. J. Mudouli of Uganda as its coordinating Secretary.

The Secretariat was charged with drafting a constitution for the new Society, and Executive Committee already met in Kampala, Uganda, during the december 1986 meeting of the Soil Science Society of East Africa. The first formal All-African Soil Science Meeting is to take place in Nigeria, August 1989.

Provisional Address: Dr. D. S. Mudouli, Secretary Interim Committee ASSS, Dept. of Soil Science, Makerere University, P.O. Box 7062, Kampala, Uganda.

ISSS wholeheartedly welcomes this new regional grouping of soil scientists!

There is now a fair and growing number of national and regional soil science societies in the tropics and subtropics. Quite a few smaller countries in these regions are however still without such a means of communication at the national and international level. We need the voices of these countries on a regular basis. Regional groups of countries without a national society can combine to occupy a seat, with voting rights, in the ISSS Council meetings, provided that together they have twenty paid-up members of the International Society. Not only nationals, but also expatriate residents of the countries concerned count as such. One may think of a grouping of South-eastern African countries, a grouping of french-speaking Central and West African countries, a grouping of Central American/Carribbean states, and one of Arab Middle-East countries.

National Societies in general can and should play a stimulating role in getting across, to politicians and to the public at large, the importance of soils and soil research in the national context.

Unfortunately, in both developing and industrialised countries, governments tend to neglect or curtail well-established soil research and extension institutions of high standing. We should strive to reverse this negative trend in industrial countries, and to strengthen such institutions in developing countries - after honest soul-searching on what we have done wrongly or neglected to do so far.

Non-agricultural aspects of soil science - soils in terms of pollution control, soil as foundation material, soil in relation to recreation, soils in relation to forest health and tropical forests conservation, soil in relation to element cycles - definitely deserve more attention from organised Soil Science. □

Formation d'une Association Africaine de la Science du Sol (AASS)

Au Congrès de Hambourg, beaucoup de pédologues présents venus d'Afrique ont participé à une réunion et décidé de former une Association Africaine. Soixante-six personnes y ont signé sur place leur adhésion et payé leur cotisation de US\$ 5,-.

Un Comité Exécutif intérimaire a été établi, dans lequel sont représentés neuf pays africains (le Burkina-Faso, le Cameroun, l'Égypte, l'Éthiopie, le Ghana, le Nigéria, le Soudan, l'Ouganda et la Zambie). Prof. A. A. Agboola du Nigéria en est le Président, et Dr. J. J. Mudouli de l'Ouganda son Secrétaire coordinateur.

Le Secrétariat a été chargé de proposer une constitution pour la nouvelle Association, et le Comité exécutif s'est déjà réuni au cours du meeting de l'Association de la Science du Sol de l'Afrique de l'Est, au mois de décembre 1986 à Kampala, Ouganda. Le première réunion officielle de l'Association Africaine de la Science du Sol se tiendra au Nigéria en Août 1989.

Adresse provisoire: Dr. D. S. Muduuli, Secrétariat du Comité Intérimaire de l'AASS, Dept. of Soil Science, Makerere Univeristy, P.O. Box 7062, Kampala, Ouganda.

Formação de uma Sociedade Africana de Ciencia do Solo (ASSS)

No Congresso de Hamburgo, uma audiência bem atendida pelos pedólogos participantes da Africa decidiu a formar uma Sociedade Africana. Sessenta e seis pessoas se registraram no local e pagaram a cota inicial de US\$ 5,-.

Um Comitê Executivo provisório foi então estabelecido, sendo representado pelos nove países Africanos (o Burkina Faso, os Camarões, o Egito, a Etiópia, a Gana, a Nigéria, o Sudão, a Uganda e a Zâmbia). Prof. A. A. Agboola da Nigéria atua como seu Presidente, e Dr. J. J. Muduuli da Uganda como seu Secretario coordenador.

A secretaria deste foi encarregado de elaborar uma constituição para a nova Sociedade, e o Comitê Executivo já se reuniu durante a reunião da Sociedade Africana Oriental de Ciencia do Solo em Kampala, Nigéria, em dezembro 1986. A primeira reunião oficial da Sociedade Africana de Ciencia do Solo sera realizada em Nigéria em agosto de 1989.

Endereço provisório: Dr. D. S. Muduuli, Secretary Interim Committee African Soil Science Society, Dept. of Soil Science, Makerere University, P.O. Box 7062, Kampala, Uganda.

Bulgarian Society of Soil Science

The fourth National Conference of the Bulgarian Society of Soil Science, held from 27 to 30 May 1986, was devoted to the subject: 'Problems of Soil Science under Intensive Farming Conditions'. Taking part in the Conference were 156 Bulgarian soil scientists as well as visitors from Cuba, Czechoslovakia, Guinea, Hungary, Morocco, Poland, the Soviet Union, Syria and Yugoslavia. The International Society of Soil Science was represented by its Deputy Secretary-General Prof. Dr. I. Szabolcs.

During the first two days of the Conference papers were presented at meetings held in the halls of the N. Poushkarov Institute of Soil Science and Yield Programming in Sofia.

After the inaugural speech of the Deputy-President of the Agricultural Academy, academician Prof. Dr. E. Nikolov, the leading paper 'Soil Science Problems under Intensive Farming Conditions' was presented by the President of the Bulgarian Society of Soil Science Prof. Dr. L. Raikov. The chief message of the paper was the idea that considering the growing importance of soil in all countries of the world, a comprehensive and effective system of conservation of these national resources has become an increasingly urgent task.

An extensive paper containing many important ideas entitled 'Present-day Problems of Soil Science in the USSR' was presented by Prof. Dr. Shishov, Director of the V.V. Dokutchayev Institute in Moscow. Further debates were carried on in five sections: soil resources (41 papers), erosion and contamination of soils (11 papers) chemistry and agrochemistry (45 papers), microbiology of soils (23 papers) and soil physics (18 papers). Thanks to perfect organization and good discipline of those presenting their papers this vast programme was fully completed.

At the plenary session ending the debates the chairmen of the sections summed up the results of discussions in their sections. President L. Raikov presented a general

estimation of the present-day state of Bulgarian soil science and its perspectives for the future. Among the most urgent tasks for the near future he listed:

- the development of agroecology as a speciality of soil science;
- the improvement of the systematics of anthropogenous soils;
- the improvement of the methods of soil conservation and of melioration of degraded soils;
- the development of effective methods of preventing soil erosion;
- the development of methods preventing the compaction of soils by heavy farming machines;
- the development of methods of rational management with soil water resources;
- the improvement of soil fertilization.

The second part of the Conference was a 2-days' scientific excursion, which took the members from Sofia to Elin-Pelin, Srednogorie, Morozovo, Stara Zagora, Gylybovo, Simeonovgrad, Tchirpan, Belozem, Plovdiv, and back to Sofia.

The participants were able to become acquainted with methods of hydromelioration of heavy clay/black earths (hydromorphic vertisols), with problems of recultivation of soils contaminated with products emitted by a copper works, with methods of counteracting soil erosion, with the recultivation of Smolnitza soils (pellic Vertisols) in areas ruined by an open mine of brown coal and with the experimental station working on methods of recultivation of saline soils (Solonchaks, Solonetz). On our way, at Strednogore, we visited the house in which N. Poushkarov, the founder of Bulgarian soil science, was born on 14 Dec. 1874. The whole trip across the beautiful and hospitable land of Bulgaria was accompanied by fine sunshine and a wonderful friendly atmosphere.

Z. Prusinkiewicz, Toruń, Poland

Polskie Towarzystwo Gleboznawcze

At a small ceremony during the Hamburg Congress, a delegation of the Polish Society of Soil Science presented Dr. W.G. Sombroek, Secretary-General of ISSS, with the diploma of his election to Honorary Membership of the Polish Society.

Soil Map of Eastern Europe in preparation

A group of specialists from Bulgaria, Hungary, Czechoslovakia, Romania, Poland and the Soviet Union met at Sofia from 2 to 6 Juni 1986 to discuss the possibility of elaborating the soil classification for the territory of CMEA-countries. The meeting was hosted by the N. Poushkarov Institute of Soil Science and Yield Programming of Bulgaria in cooperation with the V. V. Dokuchaev Soil Institute of the USSR. The discussions focused on the project to elaborate the soil classification for the European territory of CMEA-countries, to compile the Soil Map in 1:2500000 as well as to elaborate applied soil classifications for the purposes of agricultural production and to work out standards of thematical soil maps. It was felt that the achievements in the field of soil science could be used as a basis for discussions and that advantage should be taken of the international soil correlation which was achieved throughout the world. The results of five-year mutual work will be published in collective monograph 'Soils of the European Territory of CMEA-Countries' as well as in the Soil Map for this territory.

Prof. Dr. L. Shishov, Moscow, USSR

Sociedad Española de la Ciencia del Suelo

During the Congress of the ISSS held this year in Hamburg (13-20 August, 1986) Dr. Tarsy Carballas Fernandez, our countrywoman and a brilliant research scientist

from the Agrobiological Research Institute in Galicia (C.S.I.C.) at Santiago de Compostela (Spain), was elected for the post of First Vice-Chairperson of ISSS Commission II (Soil Chemistry).

Dr. Carballas got degrees in Chemistry and Pharmacy from Santiago de Compostela University, having obtained Honours in Chemistry. She also holds a Diploma for Higher Studies in Pedologie from the University of Nancy (France).

She has published many papers, both in Spanish and foreign journals on genesis and systematics of soils, as well as the characterization and study of organic matter. She is an authority at world level in the latter speciality. She has published books and maps on soils of humid Spain (natural soils of the province of Orense, Lugo, Asturias, Leon, etc.). She has also collaborated in the project of the Soil Map of Spain.

Her papers on biodegradation, organo-mineral complexes of Atlantic soils, application of C^{14} to the distribution of plant material in humic compounds, etc. are essential for the knowledge of organic matter.

Her knowledge of humus has led her recently to direct and carry out CAICYT research projects, intended to find new sources of organic matter, such as the one entitled 'Utilization of organic materials as fertilizers in Galician Agriculture'.

Dr. Carballas has translated into Spanish the most important works on Pedologie by Prof. Duchaufour, as well as others from the School of Nancy. The Spanish Society of Soil Science, of which she is a Member, is happy with this appointment and wishes to congratulate her on this occasion.

Eloy Dorado, Madrid, Spain

ISSS and Emancipation

Mrs. Dr. M. Redly (Hungary) joins Mrs. Carballas as elected lady-officer of ISSS, in her case as First Vice-Chairperson of Subcommission A (Salt-affected Soils). The 1986 Congress in Hamburg can therefore be taken as the formal start of the emancipation of ISSS.

It should however be mentioned that Mrs. Elena Gâtă of Romania served as Secretary of Commission II during the period 1960–1964, appointed in that position by the Romanian Society of Soil Science which was responsible for the organisation of the eighth Congress in Bucharest. Also, Mrs. Maya Kooystra of the Netherlands has been an intended officer of Subcommission B (Soil Micromorphology) as from its 8th inter-Congress meeting in Paris (1985). □

XI Congress of the Argentine Soil Science Society

The XI Congress coordinated by a local organizing commission and the Asociación Argentina de la Ciencia del Suelo (AACS) was held in Neuquén capital from Sept. 15 to 19, 1986. The event was attended by ca. 240 participants.

One hundred and fifteen reports were submitted to the selection committee. The papers were presented in oral and poster forms in the following sections:

1. Soil physics (13 papers initially submitted).
2. Irrigation and drainage (6).
3. Soil microbiology and biochemistry (19).
4. Soil chemistry, physical-chemistry and fertility (36).
5. Soil and water management and conservation (15).
6. Soil mineralogy, genesis, classification and cartography (26).

Two simultaneous presentations of the above sections and special symposia on land evaluation, soil conservation, and plant-Azospirillum sp. rhizosphere association were held. Each section was open with a plenary conference on the subject, covering mainly specific scientific and Argentine regional problems such as: chemodynamics of soil organic matter, irrigation situation in Argentina, mineralogy and dynamics of arid and semiarid soils.

A one-day field trip visiting soil profiles of the alluvial irrigated soils of the Neuquén and Rio Negro rivers valleys under the guidance of J. Irisarri, H. Figueira, A. Apkarian, and collaborators completed four days of a very fruitful and friendly congress. Problems of soil and land resources uses were discussed in the field.

The AACS annual meeting nominated the group from Corrientes, a beautiful and very progressive province of the sub-tropical NE of Argentina, for the organization of the next national congress in 1988.

Ramon A. Rosell, Bahía Blanca, Argentina

Announcement

X CONGRESO LATINOAMERICANO Y IX VENEZOLANO DE LA CIENCIA DEL SUELO

'Los Suelos y la Producción de Alimentos en América Latina'
Maracaibo, Venezuela, 14-21 Junio, 1987

El 10° Congreso Latinoamericano de la Ciencia del Suelo, se celebrará conjuntamente con el 9° Congreso Venezolano de la Ciencia del Suelo durante los días - 14-21 de Junio de 1986, en Maracaibo Venezuela. Es organizado por la Sociedad Venezolana de la Ciencia del Suelo con el patrocinio de la Sociedad Latinoamericana e Internacional de la Ciencia del Suelo, actuando como institución anfitriona la Facultad de Agronomía de la Universidad del Zulia.

El tema central del Congreso es 'Los Suelos y la Producción de Alimentos en América Latina', sobre el cual distinguidos especialistas invitados de Latinoamérica y de otros países presentarán trabajos, y dictarán conferencias. Asimismo se aceptarán y presentarán trabajos voluntarios, en forma oral o en cartel - (poster), sobre ese tópico o cualquier otro relacionado con la Ciencia del Suelo en América Latina.

Aparte de las sesiones de presentación de conferencias y trabajos se organizarán giras durante y después del Congreso para observar suelos, sus problemas - de manejo, y su utilización para la producción agropecuaria en la Cuenca del Lago de Maracaibo y así como para visitar lugares de interés turístico.

Es asamblea especial se someterá a consideración para ser aprobado el nuevo Reglamento de la 'Sociedad Latinoamericana de la Ciencia del Suelo'.



PRE-INSCRIPCION

Nombres, Apellidos

Título:

Cargo:, Institucion:

Dirección Postal:

Posible título de trabajo a presentar:

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(Enviar resumen no mayor de una página, escrita a máquina y a doble espacio antes del 30 de Abril de 1987).

Dirección: Comité Organizador del X Congreso Latinoamericano y IX Congreso Venezolano de la Ciencia del Suelo. Facultad de Agronomía. Universidad del Zulia. Apdo. 526. Maracaibo-Venezuela.

NEW/NOTEWORTHY

SUPPORT FOR THIRD-WORLD SCIENTIFIC PUBLICATIONS

The Australian Centre for International Agricultural Research (ACIAR) and the Canadian International Development Centre (IDRC) have agreed to provide joint support for the *East African Agricultural and Forestry Journal* of the Kenyan Agricultural Research Institute (KARI).

This prestigious scientific journal, which commenced publication in July 1935, began with contributions from agricultural stations in East Africa. But as the journal became better known its coverage extended to other (mainly) African countries. It became the major outlet for agricultural and forestry research within and outside East Africa.

Until 1977, the journal was financed jointly by Kenya, Uganda and Tanzania, the three countries of East Africa. It began facing problems when the East African Community collapsed during that year. The journal had been produced as part of the activities of the East African Agricultural and Forestry Research Organisation (EAAFRO), but with the collapse of the Community, EAAFRO activities were absorbed by the Kenyan Ministry of Agriculture. Responsibility for producing the journal then passed to KARI.

ACIAR is also assisting the Indonesian Agency for Agricultural Research and Development (AARD) in establishing the *Indonesian Journal of Crop Science*.

These are very welcome developments. Unfortunately, the *InterAfrican Bureau of Soils/Bureau Inter africain des Sols* (BIS) which used to edit the *Journal African Soils/Sols Africains*, closed down its offices in Bangui, C.A.R. The documentation of the Bureau, in part of unique historical value, has been transported to the premises of the Organisation of African Unity (OAU) in Lagos, Nigeria, pending a decision on the future headquarters of the Bureau. Unesco, IDRC and ISRIC have offered to be of assistance at the re-vitalisation of the Bureau, which can exert an important function in stimulating contacts on soil science and its application all over the African continent. □

THIRD WORLD SCIENCE PRIZE

A prize of \$10,000 will be awarded by the Third World Academy of Sciences (TWAS) for the best research essay on the scientific achievements of a Third World scientist who worked before the 20th century and whose contribution to science has not been recognized. The winning essay will be published in book form by the academy. Scholars throughout the world are invited to submit essays.

In general, the essays should meet several broad criteria: they should describe the extent to which the scientist's contributions were accepted by his or her community; they should demonstrate the link between the scientist's work and modern thought; and they should document the originality and scientific relevance of the scientist's achievements. Essays should use evidence that will be acceptable to the contemporary scientific community.

The prize will be awarded in 1988, but those intending to compete must notify the academy by October 30, 1987. Awards will be made by an International Committee of Experts on the History of Science to be appointed by the academy.

For more information contact: Executive Secretary, TWAS, History of Science Prize, International Centre for Theoretical Physics, P.O. Box 586, 34100 Trieste, Italy.

GENERAL-FOODS WORLD FOOD PRIZE

Beginning in 1987, the General Foods Fund, Inc. will award a prize of \$200,000 to an individual who has made an outstanding contribution to improving the quantity, quality, availability, and distribution of the world's food supply. Nominations for this first annual award must be made by an institution or organization qualified to assess the importance of the individual's work.

For more information and a nominating package, write to: Mr. Edward L. Williams, Prize Administrator, Winrock International, Route 3, Petit Jean Mountain, Morrilton, Arkansas 72110-9537, USA.

INTERNATIONAL RELATIONS RELATIONS INTERNATIONALES INTERNATIONALE VERBINDUNGEN

CASAF A

The annual meeting of ICSU's standing Commission on the Application of Science to Agriculture, Forestry and Aquaculture, at which the Secretarygeneral represents ISSS, took place in West-Berlin from 1 to 3 September 1986 at the invitation of the Deutsche Forschungs Gemeinschaft (DFG). It started with a technical session by scientists of the F.R. of Germany entitled 'Some examples of basic and strategic research and their importance for applied research in agriculture'. One of the contributions was by the Past Vice-president of ISSS, Prof. Dr. H. W. Scharpenseel, on the subject of Organic Matter decomposition and recycling as contribution to nutrient supply in tropical soils.

At the ensuing business meeting several items related to CASAF A's primary purpose – the promotion of cooperation between basic and applied research in agriculture for developing countries – were discussed. Dr. Harwood of WINROCK Foundation elaborated on the concept of sustainable agriculture. This led to the planning of a CASAF A symposium (no 7) on the role of green manure crops in rice-based farming systems (irrigated and dryland) that is to take place from May 18 to 22, 1987 at IRRI, the Philippines.

Dr. Swaminathan (IRRI and IUCN) introduced a seven-point action program intended for political leaders, UN member countries and the professional community, as the result of the deliberations within the Panel on Food Security, Agriculture, Forestry and Environment (one of the three panels of the World Commission on Environment and Development as established by the UN General Assembly in 1983). The key task in the years ahead will be the reorientation of agricultural policy in developed and developing countries to raise production where it is most needed and where such increases are ecologically sustainable.

Dr. Plucknett (CGIAR secretariat) reported on the functions and achievements of the various International Agricultural Research Centres. The ensuing discussion resulted in a consensus that a) donors should be convinced to give more unrestricted core funding to the Centres to allow them more flexibility in adapting their research work, and b) the gradual shift of donor's funds from institutional support to project support has left many national institutions, mainly in Africa, without the infrastructure to undertake research projects; a return to institution building is essential. The next meeting of CASAF A is to take place early september 1987 in Warsaw, Poland. □

COSTED

In 1966, the International Council of Scientific Unions (ICSU) established a standing Committee on Science and Technology in Developing Countries (COSTED).

It has its headquarters in *Madras*, India (Scientific Secretary: Dr. S. Radhakrishna, Gandhi Mantap Road, Guindy, Madras 600.025, India). At the second ICSU General Assembly it was decided that the programmes and activities of COSTED will henceforth be organised around the following seven categories: 1) Scientific Research Workshops and Seminars in Developing Countries; 2) Research Grants to Scientists in Developing Countries; 3) Visiting Lectureships and Travel Fellowships; 4) Science Education and Training in Developing Countries; 5) Technology Application and Training; 6) Scientific Instrumentation: Repair, Maintenance and Development of Scientific Equipment; 7) Science Communication and Organization.

There are now, in addition to the *Madras* centre, five regional secretariats: *East-*

Africa: Prof. D. Odhiambo, Vice-Chancellor Moi University, P.O. Box 3900, Eldoret, Kenya; *West-Africa*: Dr. A. Maduemezia, Dept. of Physics, University of Ibadan, Ibadan, Nigeria; *Latin-America*: Prof. R. Villegas, IDEA, Apartado 17606, Caracas 1015 A, Venezuela; *Caribbean*: Mr. Hollis Charles, CARIRI, Tunapuna Post Office, Trinidad, West Indies.

For Travel Fellowships in Soil Science, COSTED has entered into cooperation with ISSS, supplying grants for two persons per scientific meeting in a developing-country regio via the Fellows Fund facility. □

ICSU

The 21st General Assembly of the International Council of Scientific Unions took place in Berne, Switzerland from 14 to 19 September 1986. ISSS, which is an associate member of ICSU since 1972, was represented by its Secretary-General. The meeting provided an opportunity to strengthen contacts with National Academies of Sciences and with several of ICSU's full and associate members for cooperation on specific items (as with the International Geographic Union IGU; the International Union of Biological Sciences IUBS; the International Union of Pure and Applied Chemistry IUPAC; the International Union of Forestry Research Organisations IUFRO; and the International Union of Nutritional Sciences IUNS). The cooperation of ISSS in several of ICSU's standing committees was formalised (CASAFA, SCOPE, CODATA, COSPAR, COSTED). The recently established ICSU Press may become a good channel for ISSS-originated scientific publications.

Very thought provoking was a Symposium on the Environmental Effects of Nuclear War, on the basis of a thorough study by a SCOPE Working-Group on the subject (ENUWAR). It dealt not only with the direct effects of a 'nuclear war' (Crutzen), but also with the worldwide breakdown of communications, food transports, etc.. Longer-term consequences such as shifts in agro-climatological zones and affectation of soil quality (increased soil erosion, wilful or accidental spread of toxic industrial waste) would still warrant special attention of soil scientists and agronomists.

The main item at the Assembly was the presentation of a programme for multidisciplinary research in global changes: the International Geosphere-Biosphere Programme (IGBP), on the basis of reports by ad-hoc planning groups formed two years ago (cf. ISSS Bulletin 84/2, pages 51–52). Four main introductions were given, viz:

- *Changes in the Solid Earth*; their use in paleoclimatology and for studying future changes (R. Price et al.) – specifying a.o. the need for studies on pathways, sinks and reservoirs of the Phosphorus cycle; the suitability and production rates of soils of different characteristics; trace element balances in soils; the minimisation of soil erosion, and the need for global assessment of future soil resources.
- *Changes in Terrestrial Ecosystems* and associated changes in the chemistry of the atmosphere (F. di Castri et al.) – specifying a.o. the incorporation of spatial resolution and spatial variation in soil and vegetation in inventory and monitoring programmes; the integration of soil data in accessible data bases through cooperation with ISSS and ISRIC.
- *Modifications of Marine Ecosystems*, and associated problems of marine chemistry (J. C. McCarthy et al.).
- *Solar-Terrestrial Relationships*, and changes in the upper atmosphere and near-earth space (J. G. Roederer et al.).

The programme as outlined was approved unanimously by the ICSU Assembly. Prof. Dr. Thomas Rosswall, a well-known soil biologist from Sweden, was appointed as its scientific director, and a secretariat is being established at the Swedish Royal

Academy of Sciences in Stockholm. A 15-persons Special Committee (SCGB) is to be formed early 1987 to work out details. One of the likely outcomes will be the identification of biological observatories and of some 'mega transects' in the various continents for multidisciplinary studies on solid earth and on terrestrial ecosystems.

In view of the apparent need for a substantial input by the Soil Science community, including early attention to soil geographic and global soil data base aspects (cf. the SOTER initiative), the Secretary-General's name was submitted for initial membership in the Special Committee. A number of subcommittees are to be formed for specific items of the IGBP programme, and several members of the now officialised ISSS Committee on International Programmes (cf. Report of the ISSS Council in this Bulletin) are expected to be closely involved in these subcommittees. □

INTERNATIONAL STANDARDISATION ON SOIL QUALITY

In recent years there has been an increasing interest in the field of environmental pollution. This led to an increasing interest in worldwide standardization of parameters related to the environment and their measurement procedures. Various international standards have been published by the International Standards Organisation (ISO) e.g. standards on air quality and on water quality. The establishment of standards on soil quality is a logical next step in this development.

For this purpose the ISO has established a Technical Committee on 'Soil Quality', ISO-TC 190.

An ISO-technical committee has as its members the national normalisation institutes (e.g. DIN for the FRG, NNI for the Netherlands, AFNOR for France). Besides this a TC can have liaisons with international professional associations like ISSS. These liaisons are being informed on the developments in the TC and are invited to attend the meetings as observers.

To the first meeting of ISO-TC 190 (3rd to 5th June 1986 in the Hague, the Netherlands) the ISSS had been invited as observer. This meeting was attended by delegates from Germany (Fed. Rep.), France, Australia, China (Peoples Rep.), Italy, Sweden, Switzerland, the U.K. and the Netherlands. On behalf of ISSS this meeting was attended by Prof. Dr. H. W. Scharpenseel and by Ir. L. K. Pleijsier (on behalf of Dr. W. G. Sombroek).

The meeting agreed on the scope of ISO-TC 190 as:

Standardization in the field of soil quality, including protection and classification, definition of terms, sampling of soils, measurement and reporting of soil characteristics. (Excluded are limits of acceptability for soil pollution and civil engineering aspects.)

During the meeting 5 subcommittees were installed, each to cover part of the broad field of 'soil quality'.

Subcommittee 1: Evaluation of criteria, terminology and codification

Subcommittee 2: Sampling

Subcommittee 3: Chemical methods and soil characteristics

Subcommittee 4: Biological Methods

Subcommittee 5: Physical Methods

The subcommittees have been subdivided into working groups on the various subjects within their programme of work.

The ISSS-observers got the impression that, although the ISO is only marginally engaged in soil science, they are professionally highly qualified in the field of standardization and documentation, as has been proven with ISO projects on water and air. However ISO seems not to be fully aware of the special problems that will be encountered in standardization of the many aspects of soil science. It was stressed to the

committee that it is necessary for them to get acquainted with all the efforts that have been made already in the field of soil classification, standardization of terminology, definitions, etc. Also the necessity was stressed for ISO to have a liaison with ISSS in order to have an eventual standard being adopted and used by the ISSS-members.

Although the observers participated in the discussion, they refrained from taking position on behalf of ISSS beyond a general expression of existing interest. It was stated that a decision for a more active collaboration is the prerogative of the ISSS-Council that was to be held at Hamburg in August 1986.

At the ISSS-Council meeting in August 1986 at Hamburg a positive approach was adopted towards these ISO efforts. A standing 'Inter-Commissional Committee on Standardisation' will be formed, composed of ten members, of each (Sub-)Commission and nominated by its Officers. This standing committee will act as counterpart for the ISO-TC 190 (see also the 'Report on the Council').

Individual Council members will also liaise with the respective national soil science representatives in the five TC-190 subcommittees and working groups established thus far. □

FAO STUDY: AN EVALUATION OF SOIL CONSERVATION PROJECTS

The Soil Resources, Management and Conservation Service of FAO (AGLS) has commissioned a study of soil conservation projects to try to identify reasons why some projects are more successful than others. The study will be in two parts. The first phase, to be completed by the end of 1986 or soon after, is a desk-top review of all projects which might be suitable, and the selection of some projects suitable for detailed analysis in the second phase which will be completed by the end of 1987.

In the first phase perhaps 40 or 50 projects will be considered, and about 10 or so selected for the detailed analysis in Phase 2. Field visits will be made to some projects, for instance to see the present state of a project which was last written up some years ago, or to check progress on a new project.

The selected projects should meet as many as possible of the following criteria:

- world-wide geographical distribution, and range of climates.
- long-established, recent, and ongoing projects.
- projects by FAO, by other International Agencies, by National Agencies, and by NGOs.
- short-term projects and long-term programmes.
- large team projects and one-man missions.
- projects entirely about soil conservation, and projects where soil conservation is only one component.
- projects in developed and in developing countries.
- action projects and institution-building projects.

An important part of the first Phase will be assembling written reports, data, and comments and opinions. If you can help by drawing our attention to interesting projects or to sources of data or reports, please write to me at this address.

There are presently two other similar projects and this FAO project is working with both: the World Association of Soil and Water Conservation (WASWC) is planning a workshop in March 1987 on successful conservation projects, and the International Institute for Environment and Development (IIED) is planning a workshop on sustainable development projects in April 1987.

N. Hudson, 2 Bedford Street, Amptill, Bedford MK45 2NB, U.K.

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

Meetings etc. marked with*, are organized or sponsored by the ISSS.

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Tagungen usw., angezeigt mit*, werden organisiert oder unterstützt von der IBG

1987

8th West and Central African Soil Correlation and Land-Evaluation Meeting, Cameroon, January 19–28, 1987 (FAO).

Information: Dr. Rachim Sant'anna, FAO Regional Soil Resources Office for Africa, P.O. Box 1628, Accra, Ghana.

Symposium on Fertilizer Sulphur Requirements and Sources in Developing Countries of Asia and the Pacific, Bangkok, Thailand, January 27–31, 1987.

Information: Mr. L. M. Maene, UN Building, Rajdamnern Avenue, Bangkok 10200, Thailand.

***International Symposium on Tropical Peats and Peatlands for Development**, Yogyakarta, Indonesia, February 9–14, 1987 (International Peat Society).

Information: Dr. B. Radjagukguk, Dept of Soil Science, Fac. of Agriculture, Gadjah Mada University, Sekip, Yogyakarta, Indonesia.

4th International Congress of Ecology (Intecol/IUBS), Syracuse, USA, February 10–16, 1987.

Information: E. S. Ayensu, 9200 Wilmett Court, Bethesda, MD 20817, USA.

International Symposium on Loess, Taita, New Zealand, February 13–21, 1987 (Western Pacific Working Group of the INQUA Loess Commission).

Information: Dr. D. N. Eden, N.Z. Soil Bureau, Private Bag, Lower Hutt, New Zealand.

***International Symposium on Aforestation of Salt-affected Soils**, Karnal-Haryana, India, February 16–20, 1987 (Indian Society of Soil Science, ICAR and ISSS Subcommission A).

Information: Dr. I. P. Abrol, Director, Central Soil Salinity Research Institute, Karnal 132001, India.

International Symposium on Groundwater Monitoring and Management, Dresden, GDR, March 23–28, 1987 (IHP National Committee, with Unesco, WMO and IAHS).

Information: Dr. P. Lösel, Institut für Wasserwirtschaft, Schneller Strasse 140, 1190 Berlin, German Democratic Republic.

International Workshop on Soil and Water Conservation on Steeplands, San Juan, Puerto Rico, March 23–27, 1987 (SCSA and WASWC).

Information: Dr. W. Peechatca, Soil Conservation Society of America, 7515 NE Ankeny Road, Ankeny, Iowa 50021-9764, USA.

International Symposium on Elementary Sulphur in Agriculture, Nice, France, March 25–27, 1987.

Information: Secr. Symposium Le Soufre Élémentaire en Agriculture, 32 La Canebière, 13231 Marseille Cedex 1, France.

Workshop on Erosion, Transport and Deposition Processes, with emphasis on Semi-arid and Arid areas, and including a session on Desert Loess, Jerusalem, Sede Boqer, Elat, Israel, March 28–April 3, 1987 (IAHS Commission on Continental Erosion and IGU Commission on Measurement Theory and Application in Geomorphology).

Information: Prof. A. Yair, Physical Geography, Institute of Earth Sciences, HUJ, 91904 Jerusalem, Israel.

***International Conference on the Vulnerability of Soil and Groundwater to Pollutants**, Noordwijk, the Netherlands, March 30–April 3, 1987 (Organized by the Dutch National Institute of Public Health and Environmental Hygiene RIVM, with co-sponsoring of IAH, IAHS and ISSS).

Information: Ir. W. van Duijvenbooden, RIVM, Postbus 150, 2260 AD Leidschendam, the Netherlands.

7th Eastern African Soil Correlation and Land Evaluation Meeting, Gaborone, Botswana, March 30–April 9, 1987 (FAO).

Information: Dr. R. Sant'anna, FAO Regional Soil Resources Office for Africa, P.O. Box 1628, Accra, Ghana.

International Symposium on Hydrology in Perspective; Lessons from the past: Prospects for the future, Rome, Italy, April 6–10, 1987 (IAHS and IAHR).

Information: Dr. J. C. Rodda, Secretary General IAHS, Institute of Hydrology, Wallingford, Oxon OX10 8 BB, England; or: M. J. E. Prins, Secretary IAHR, P.O. Box 177, 2600 MH Delft, the Netherlands.

International Symposium on the Fertilization of Vegetables under protected cultivation, Naaldwijk, the Netherlands, April 6–12, 1987 (Working Group of the International Society for Horticultural Science).

Information: Dr. J. Roorda van Eysinga, Glasshouse Crops Research and Experiment Station, P.O. Box 8, 2670 AA Naaldwijk, the Netherlands.

International Symposium on Agricultural Waste Management and Environmental Protection, Braunschweig, FRG, May 11–14, 1987 (CIEC).

Information: Dr. R. Krause, Inst. of Plant Nutrition and Soil Science, Braunschweig-Völkenrode, Bundesallee 50, D-3300 Braunschweig, F. R. of Germany.

***International Symposium on Advances in Nitrogen Cycling in Agricultural Ecosystems**, Brisbane, Australia, May 11–15, 1987 (Co-sponsorship of ISSS Commission III and IV).

Information: Mr. Keith Weier, Symposium Secretary, Div. of Tropical Crops and Pastures, CSIRO, Cunningham Laboratory, St. Lucia, Brisbane, Queensland, 4067 Australia.

Symposium on Coastal Lowlands, Geology and Geotechnology, the Hague, the Netherlands, May 25–27, 1987.

Information: Coastal Lowlands Symposium, c/o Congrex, Keizersgracht 610, 1017 EP Amsterdam, the Netherlands.

***10th Congress of the Latin American Society of Soil Science**, Maracaibo, Venezuela, June 14–21, 1987.

Information: Prof. I. Pla-Sentis, Las Acacias, Apartado 1131, Maracay, Venezuela.

1st Conference of the International Federation of Classification Societies, (classification and related methods of data analysis), Aachen, FRG, June 29–July 1, 1987.

Information: Prof. Dr. H. H. Bock, Technical University Aachen, Wuellnerstrasse 3, D-5100 Aachen, F. R. of Germany.

3rd International Congress on Applied Mineralogy, Orléans, France, July 6–10, 1987.
Information: Secretary ICAM'87, Lab. de Minéralogie Appliquée, B.P. 6749, 45067 Orléans Cedex 2, France.

International Conference on Measurement of Soil and Plant Water Status, Logan, Utah, USA, July 6–10, 1987.

Information: R. J. Hanks, Dept. of Soil Science and Biometeorology, Utah State University, UT 84322-4840, USA.

4th International Symposium on Iron Nutrition and Interaction in Plants, University of New Mexico, Albuquerque, USA, July 7–10, 1987.

Information: Dr. L. L. Barton, Dept. of Biology, Univ. of New Mexico, Albuquerque, NM 87131, USA.

31st Congress of the International Union of Pure and Applied Chemistry (IUPAC), Sofia, Bulgaria, July 13–18, 1987.

Information: Dr. T. West, Secretary General IUPAC, Macaulay Inst. for Soil Research, Craigiebuckler, Aberdeen AB9 2QJ, Scotland.

14th International Botanical Congress, West Berlin, FRG, July 24–August 1, 1987.

Information: Dr. W. Greuter, Köningin-Luise-Strasse 6–8, D-1000 Berlin 33, FRG.

12th Congress of the International Union of Quaternary Research (INQUA), Ottawa, Canada, July 31–August 9, 1987.

Information: Dr. Alan V. Morgan, Dept. of Earth Sciences, University of Waterloo, Waterloo, Ontario, Canada N2L 3G1.

International Symposium on Erosion & Sedimentation in Pacific Rim Countries, Corvallis, Oregon, USA, August 3–7, 1987 (IAHS and IUFRO).

Information: Dr. R. Beschta, Dept. of Forest Engineering, Oregon State University, Corvallis, OR 97331, USA.

International Symposium on the Dynamics of Land Use Systems, Asahikawa, Hokkaido, Japan, August 8–12, 1987 (IGU).

Information: Y. Himiyama, Inst. of Geography, Hokkaido University of Education, 9-Hokumoncho, Asahikawa 070, Japan.

9th General Assembly of the International Union of Geodesy and Geophysics (IUGG), Vancouver, Canada, August 9–22, 1987, with Symposia and Workshops by the International Association of Hydrological Sciences (IAHS) on Forest Hydrology and Watershed Management; Irrigation and Water Allocation; Methods of Runoff and Stream Flow Simulation; Estimation of Areal Evapotranspiration; Origin and Evolution of Sedimentary Basins, etc.

Information: G. D. Young, CNC/IAHS, Inland Water Directorate, Environment Canada, Ottawa, Ontario, K1A 0E7, Canada.

***International Conference on Steepland Agriculture in the Humid Tropics**, Kuala Lumpur, Malaysia, August 17–20, 1987 (Malaysian Society of Soil Science, with Malaysian Agricultural Research & Development Institute MARDI).

Information: Dr. Z. Abdul Rahman, MSS, P.O. Box 12644, 50784 Kuala Lumpur, Malaysia.

International Symposium on Plant Roots and their Environment, Uppsala, Sweden, August 1987.

Information: Dr. H. Persson, Dept. of Ecology and Environmental Research, University of Agricultural Sciences, Box 7072, 75007 Uppsala, Sweden.

13th Congress of the International Commission on Irrigation & Drainage (ICID), Rabat, Morocco, August 1987.

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

Symposium on Mineral Nutrients in Savanna & Tropical Forest Ecosystems, Stirling, Scotland, U.K., August 26–28, 1987.

Information: J. Proctor, Dept. of Biological Science, Univ. of Stirling, Stirling FK9 4LA, U.K.

9th International Biophysics Congress, Jerusalem, Israel, August 23–28, 1987.

Information: Dr. J. Tigyí, Secretary-general IUPAB, Inst. of Biophysics, Medical University, Izigei ul 12, 7640 Pécs, Hungary.

22nd Congress of the International Association of Hydraulic Research (IAHR), Lausanne, Switzerland, August 31–September 4, 1987.

Information: Mr. W. H. Graf, EPFL Laboratoire d'Hydraulique, 1015 Lausanne, Switzerland.

International Symposium on the Protection of Water Quality from Harmful Emissions, with special regard to Nitrate, Balatonfüred, Hungary, September 1–4, 1987 (CIEC).

Information: Hungarian Soc. of Agricultural Sciences, Kossuth Lajos tér 6–8, 1055 Budapest 5, Hungary.

***5th International Meeting on the Submicroscopy of Undisturbed Soil Materials**, Aberdeen, Scotland, September 14–18, 1987 (Cosponsoring by ISSS Subcommittee B).

Information: Dr. W. J. Hardy, Dept. of Mineral Soils, The Macaulay Institute for Soil Research, Craigiebuckler, Aberdeen, AB9 2QJ, Scotland.

6th International Conference on Heavy Metals in the Environment, New Orleans, USA, September 15–18, 1987.

Information: Heavy Metals Secretariate, CEP Consultants Ltd., 26 Albany Street, Edinburgh EH1 3QH, United Kingdom.

International Symposium on Agrohydrology, Wageningen, the Netherlands, September 29–October 1 st, 1987.

Information: IAC-OCC, P.O. Box 88, 6700 AB Wageningen, the Netherlands.

Symposium on the Aerial Application of Pesticides in Forestry, Ottawa, Canada, October 20–22, 1987.

Information: K. Charbonneau, National Research Council of Canada, Montreal Road, Ottawa, Ont. K1A 0R6, Canada.

14th International Congress of Biochemistry (IUB), Prague, Czechoslovakia, Oct. 1987.

Information: R. L. Hill, Biochemistry Department, Duke University Medical Center, Durham, NC 27710, USA.

International Symposium on Interaction between Ground Water and Surface Water, Lund, Sweden, October 1987.

Information: Dr. J. C. Rodda, Secretary General IAHS, Inst. of Hydrology, Maclean Building, Crowmarsh Gifford, Wallingford, Oxfordshire, OX10 8BB, England.

1988

***5th International Soil Conservation Conference**, Bangkok, Thailand, January 18–29, 1988 (ISCO; cosponsoring by ISSS Subcommittee C).

Information: Mr. Sanarn Rimwanich, President ISCO, c/o Dept. of Land Development, Phaholyotin Road, Bangkok 10900, Thailand.

***International Workshop on Classification, Management and Use potential of Swell-shrink Soils**, Nagpur, India, February 1988 (ISSS Commissions V and VI).

Information: Dr. J. Sehgal, Director, National Bureau for Soil Survey & Land Use Planning, Nagpur 440010, India.

***International Conference on Utilization of Soil Survey Information for Efficient Land Use Management**, Nairobi Kenya, February 1988 (ISSS Commission V).

Information: Mr. F. N. Muchena, Kenya Soil Survey, P.O. Box 14733, Nairobi, Kenya.

International Conference on Agricultural Engineering 1988, Paris, France, March 2–6, 1988.

Information: Dr. Francis Sevila, CEMAGREF, B.P. 5095, F-34044, Montpellier cedex, France.

7th International Congress on Soilless Culture, Flevohof, the Netherlands, May 13–21, 1988.

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

***International Conference on Measurement and Validation of Solute Transport through the Unsaturated Zone**, Las Cruces, New Mexico, USA, May 17–20, 1988 (Cosponsoring ISSS Commission II).

Information: Dr. P. J. Wierenga, Dept. of Horticulture, Crop & Sciences, N. M. State University, Las Cruces, NM 88003, USA.

6th IWRA World Congress on Water Resources: Water for World Development, Ottawa, Ont., Canada, May 29–June 3, 1988.

Information: P. J. Reynolds, Inland Waters Directorate, Environment Canada, Ottawa, Ontario, Canada K1A-OE7.

***International Symposium on Solonetz Soils; problems, properties and utilizations**, Osijek, Yugoslavia, June 15–21, 1988 (ISSS Subcommission A).

Information: Dr. M. Adam, Agricultural Faculty, 54000 Osijek, Tenjska cesta 66, Yugoslavia.

3rd International Symposium on Genetic Aspects of Plant Mineral Nutrition, Braunschweig, FRG, June 19–23, 1988.

Information: Dr. M. Dambroth, Inst. of Crop Science and Plant Breeding, FAL, Bundesallee 50, D-3300 Braunschweig, F.R. of Germany.

***8th International Meeting on Soil Micromorphology**, San Antonio, Texas, USA, July 10–15, 1988 (ISSS Subcommission B).

Information: L. P. Wilding, Department of Soil and Crop Science, Texas A & M University, College Station, TX 77843, USA.

11th Conference of the International Soil Tillage Research Organization (ISTRO), Edinburgh, Scotland, July 11–15, 1988. Theme: Tillage and Traffic in Crop Production.

Information: Dr. B. D. Soane, President of ISTRO, Scottish Institute of Agricultural Engineering (SIAE), Bush Estate, Penicuik, Midlothian EH26 OPH, Scotland.

5th International Conference on Permafrost, Trondheim, Norway, August 2–5, 1988.

Information: The Norwegian Institute of Technology, Studies Administration, N-7034 Trondheim-NTH, Norway.

International Conference on Dryland Farming, Amarillo/Bushland, Texas, August 15–19, 1988

Information: Dr. B. A. Stewart, USDA Conservation and Production Research Lab., P.O. Drawer 10, Bushland, Texas 79012, USA.

26th International Geographical Congress, Sydney, Australia, August 22–26, 1988.

Information: B. Thom, Dept. of Geography, Institute Building, University of Sydney, Sydney 2006, Australia.

***International Symposium on Land Qualities in Time and Space**, Wageningen, the Netherlands, August 23–26, 1988 (ISSS Working Groups MV and LI).

Information: Ir. A. Bregt, Symposium Secretary, c/o Dutch Soil Survey Institute, P.O. Box 98, 6700 AB Wageningen, the Netherlands.

***10th International Soil Zoology Colloquium**, Bangalore, India, August 1988 (Sub-commission D and IUBS).

Information: Dr. G. K. Veeresh, Dept. of Entomology, University of Agricultural Sciences, Hebbal, Bangalore 560 024, India.

***9th Symposium Humus and Plants**, Prague, Czechoslovakia, August 1988.

Information: Dr. B. Novak, Research Inst. for Crop Production, Drnovska 507, 16101 Praha 6-Ruzyně, Czechoslovakia.

***International Symposium on Time and Space Variability of the Components of the Soil Water Balance**, Bratislava, Czechoslovakia, August 30–September 3, 1988 (ISSS Commission I, and IAHS).

Information: Prof. J. Benetin, Inst. of Hydrology and Hydraulics SAV, Travska 32, 82651 Bratislava, Czechoslovakia.

1989

***International Conference on Soil Compaction as a Factor determining Plant Productivity**, Lublin, Poland, June 1989 (ISSS Commission I).

Information: Prof. J. Glinski, Institute of Agrophysics, Krakowskie Przedmiescie 39, 20-076 Lublin, Poland.

28th International Geological Congress, Washington DC, USA, July 9–19, 1989.

Information: Secretariat Int. Geol. Congress. P.O. Box 1001, Herndon, VA 22070, USA.

***International Meeting on Rock Weathering and Soil Mineralogy**, Strasbourg, France, July 1989 (ISSS Commission VII, with AIPEA).

Information: Dr. A. Herbillon, CNRS, Centre de Pédologie Biologique, B.P. 5, 54501 Vandœuvre-les-Nancy Cedex, France.

***1st Congress of the African Soil Science Society**, Nigeria, August 1989.

Information: Prof. A. Agboola, Un. of Ibadan, Dept. of Agronomy, Ibadan, Nigeria.

1990

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, Szigetű 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.

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

Information: Dr. K. Kumazawa, Chairman, Organising Committee 14th ISSS Congress, Faculty of Agriculture, Univ. of Tokyo, Yayoi, Bunkyo-ku, 113, Tokyo, Japan.

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. Le Secrétariat de l'AISS ne peut pas traiter les commandes, celles-ci doivent être adressées à une librairie ou directement aux éditeurs. Presque toutes les publications mentionnées peuvent toutefois être inspectées au siège. 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 besichtigen an der Stelle der IBG, p/A Internationales Bodenreferenz und Informations Zentrum (ISRIC) im Wageningen, Holland.

La couverture des sols et les sols de la Mongolie. Pocivennii pokrov i pocivi Mongolii. J. P. Gherasimov, N. A. Noghina. Ed. Nauka, Moscou 1984. Cette étude, qui est le résultat d'une collaboration de sept chercheurs, essaye de donner une vue d'ensemble sur les sols de la République Populaire Mongole.

Organisé en deux parties, le livre donne tout d'abord des informations d'ordre général concernant les conditions naturelles et les sols du pays. Dans le premier chapitre, un historique des études est présenté. Les ch. 2 et 3 traitent des facteurs de genèse et de leur importance pour les processus de formation des sols. Suit une caractérisation générale des zones des sols (ch. 4) et un groupement géographique (ch. 5).

La deuxième partie, s'occupant de la systématique, rassemble les sols en deux grands groupes: 1) sols de hautes montagnes et taïga de montagne et 2) sols de steppe, de semi-désert et désert. Une description détaillée des unités des sols est donnée, ainsi que des descriptions des profils typiques avec leur données analytiques. Une carte des sols à l'échelle 1:2.500.000 accompagne l'étude.

Commandes à: Institut Dokuchaev, Pyjevski 7, 109017, Moscou.

N. Pons-Ghitulescu, Wageningen.

Trickle Irrigation for Crop Production. Design, Operation and Management. Developments in Agricultural Engineering 9. F. S. Nakayama and D. A. Bucks, editors. Elsevier Science Publishers, Amsterdam 1986, x + 384 p. ISBN 0-444-42615-9.

Trickle irrigation is the slow application of water on, above, or beneath the soil by surface trickle, subsurface trickle, bubbler, spray, mechanical-move, and pulse systems. Water is applied as discrete or continuous drops, tiny streams, or miniature spray through emitters or applicators placed along a water delivery line near the plant. The shape or design of the emitter reduces the operating pressure from the supply line, and a small volume of water is discharged at the emission point. Water flows from the emission points through the soil by capillarity and gravity. The trickle applied at a low rate, over a long period of time, at frequent intervals; near or into the plant's root zone, and by a low-pressure delivery system.

Advances in trickle irrigation systems and practices have been rapid. Trickle irrigation, like other irrigation methods, will not fit every agricultural crop, land situation, or user objective. However, trickle irrigation does offer many unique agronomic, agrotechnical, and economic advantages for the present and future irrigation technologies.

The present, multi-purpose, handbook on this new agricultural technology brings together current knowledge from various engineering and scientific disciplines (crop, hydraulic, irrigation and soil sciences) needed for understanding the trickle irrigation system for crop production ranging from the basic to the more practical aspects of trickle irrigation. Major topics included design, operation and management – with individual chapters covering historical development, emitter construction and clogging, system design, water and salt distribution, automation, water treatment, irrigation scheduling, maintenance, fertilization and salinity. It is useful as a teaching and reference source for students, manufacturers and irrigation system operators as well as irrigation and crop specialists, and consultants.

Price: Dfl. 160.00.

Orders to: in U.S.A. and Canada: ASAE, 2950 Niles Road, St. Joseph, MI 49085-9659, U.S.A.; elsewhere: Elsevier Science Publishers, P.O. Box 211, 1000 AE Amsterdam, The Netherlands.

Principles of Geographical Information Systems for Land Resources Assessment. Monographs on Soil and Resources Survey No. 12. P.A. Burrough. Clarendon Press, Oxford, 1986, 193 p. ISBN 0-19-854563-0, hardback; 0-19-854592-4, paperback.

This book describes and explains the principles of geographical information systems that are important for most applications in environmental and natural resources inventory and analysis. It describes the major

components of geographical information systems, including raster and vector data structures, modules for data input, verification, storage, and output, digital terrain models, method of spatial analysis and modelling, and methods of classification and interpolation. Besides discussing the latest developments in these fields, there is also a critical review of the sources and propagation of error in geographical information processing, a subject that has received less than its due share of attention.

Although the text makes references to many results derived by using geographical information systems, this book is not intended to be a review of current applications, but rather an explanation of the principles behind many systems now in common use. The maps used to accompany the text have been chosen for their suitability for illustrating various aspects of the techniques explained. There has been an attempt to include a range of technical quality in the figures from results from some of the best modern film scanners to simple raster maps drawn on a graphics matrix printer driven by a personal computer.

The literature on geographical information systems is vast and is spread over a large number of journals representative of many disciplines. There is also a huge 'grey' literature of conference papers, internal reports, and theses. The extensive bibliography should provide readers with the means to follow any particular topic further.

Although technical principles are important, it is also essential that if geographical information systems are to be properly used then they must be properly accommodated in the organization in which they are to be used. Although the costs of computer hardware are falling steadily in relation to the power of the systems available, computer software remains a considerable investment. It is essential that the software and hardware are properly matched to an organization's needs, and the last chapter attempts to provide some guidelines about how a geographical information system can best be chosen. This chapter will undoubtedly date quickly as technology advances, but the principles discussed will remain valid for some time.

Price: £ 40.00 hardback; £ 20.00 paperback.

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

Fertilizer Technology and Use. Third edition. O. P. Engelstad, editor. Soil Science Society of America, Madison, 1985, 633 p. ISBN 0-89118-779-0.

The recognized need for and usefulness of additional nutrient elements has led to the development of a large heavy chemical industry sector supplying plant-based agricultural activities. This had led to voluminous research on the science and technology of fertilizer production, distribution, needs, and economic use. From time to time, these new ideas should be made available for use by practitioners in the extended field of fertilizers, soil fertilization, and plant nutrition. This volume addresses that purpose.

Other issues surrounding fertilizer production and use have surfaced during the last 10 or 20 years. One of these is the exhaustible nature of the prime resources for fertilizer manufacture. This reality makes it important that fertilizers be used efficiently and effectively. Another issue is that fertilizers are implicated more and more in environmental problems, especially those concerning both surface and subsurface water supplies. Demonstrated prudent use of fertilizers is one step in avoiding unnecessary contamination. An informed public is more likely to deal rationally with positive and negative factors associated with production technology, so this volume has a significant potential role beyond production agriculture alone.

This third edition embodies the latest developments in fertilizer technology and use. The authors present current information on fertilizer markets; soil and tissue testing; fertilizer-plant interactions in both acid and alkaline soils; behaviour of plant nutrients in flooded soils; the production, marketing and use of macronutrient, secondary and micronutrient fertilizers in solid, solution, and suspension forms; slow-release and inhibitor-amended nitrogen fertilizers, fertilizer use in relation to the environment, including concerns for nonpoint pollution effects; and the nutritional quality of crop plants in relation to fertilizer use. A chapter dealing with organic sources of nutrients replaces an earlier chapter on human and animal wastes as fertilizers. New chapters in this edition are entitled 'Agronomic and Statistical Evaluation of Fertilizer Response' and 'Modern Techniques in Fertilizer Application'. The latter is especially relevant to the increasingly popular conservation tillage practices.

Price: US\$ 40.00; plus \$ 0.75 per book on orders outside the U.S.A. Pre-payment required.

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

The Human Impact on the Natural Environment. Second edition. A. Goudie. Basil Blackwell, Oxford, 1986, 338 p. ISBN 0-631-13758-0, paperback; 0-631-13759-9, hardback.

This book is concerned with the ways in which humans have changed and are changing the face of the earth, and with the human role in natural processes and systems. It has been written primarily for university students of geography and environmental science.

The book opens with a consideration of the development of ideas about interaction between humans and the environment, in particular those relating in population increase and technological change. Chapters are devoted to the human impact on vegetation, animals, the soil, water and water resources, landforms, and climate and the atmosphere. The author analyses the causes and consequences of environmental change, and shows how these processes and phenomena interrelate and how the complex of relationships may alter with time.

The second edition has been updated throughout to take account of the latest literature and research, and contains many new plates, figures and tables. Sections on issues such as extinction, deforestation, genetic impoverishment, human-induced climatic changes and acid rain have been rewritten and extended to cover these problems in greater depth. The final chapter has been revised to include an extensive discussion on conservation. This textbook is well-illustrated with diagrams, maps and photographs.

Price: £ 8.50, paperback; £ 27.50 hardback.

Orders to: Basil Blackwell, 108 Cowley Road, Oxford OX4, 1JF, England.

Manual of Soil Laboratory Testing. Volume 3, Effective stress tests. K. H. Head. Pentech Press, London, 1986, 495 p. ISBN 0-7273-1306-1.

This book, which completes the present series of three volumes on soil laboratory testing, is an extensive review of the tests that invoke the effective stress concept – the fundamental principle in the science of soil mechanics for the prediction of stability and deformation. The series is intended as a working manual for those involved in soil testing for construction and civil engineering purposes, such as technicians, supervisors, engineers and designers, as well as students and teachers of the subject.

Volume 3 covers soil testing in terms of effective stress, for which the measurement of pore water pressure is the essential feature. The principal and theory of effective stress are explained, practical applications are outlined and test apparatus, including its calibration, is described. The core of the book is devoted to 'routine' consolidated-drained and consolidated-undrained triaxial test procedures for the determination of effective strength parameters. Other types of strength tests, and triaxial tests for the measurement of permeability, isotropic and anisotropic consolidation, and earth pressure characteristics, are included.

Consolidation tests with pore pressure measurement in the hydraulic consolidation cell and the advantages of using this apparatus, are described. Tests for the measurement of vertical and horizontal permeabilities are given. Continuous-loading consolidation tests are discussed, and several recognised procedures are outlined.

Throughout the book reference is made to electronic instrumentation and automatic data-logging facilities as well as to conventional manual methods of observation and recording. The application of micro-processors and computers to the automatic control of certain tests using closed-loop feedback systems, which offers scope for future development, is included.

These well-written and profusely illustrated volumes will be useful for persons interested in geotechnology. Volume 1, Soil Classification and Compaction Tests, was published in 1980; Volume 2, Permeability, Shear Strength and Compressibility Tests, in 1982.

Price: £ 42.00. The three volumes set £ 99.00 or US\$ 168.30.

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.

Acid-Base Chemistry. C. W. Hand and H. L. Blewitt. Macmillan Publ. Comp., New York and Collier Macmillan Publ., London, 1986, 273 p. ISBN 0-02-349910-9.

In the broadest sense, acid-base chemistry includes any interaction that takes place between electron-rich species (bases) and electron-poor species (acids). In this context electron-rich means a capability for giving up or sharing electrons with another species, and electron-poor means a capability for accepting or sharing electrons from another ions of neutral species. Free radicals and radical ions are included in this definition. Most chemical reactions, in fact, occur between electron-rich and electron-poor species, and therefore may be categorized as acid-base reactions. The attraction and interaction between such species are discussed in detail in this text; the principles derived in the discussion give insight into how chemical reactions occur and aid in understanding why they occur. This book is specifically written for first and second year college chemistry courses.

Price: £ 15.50.

Orders to: Macmillan Distribution Ltd., Houndsmills, Basingstoke, Hants, RG21 2XS, England; or: Macmillan Publ. Comp., 866 Third Avenue, New York, NY 10022, U.S.A.

Natural Resources and Environmental Management at North American Universities. A guide to Training Opportunities. R. Kelly. RARE, WWF and IIED, 1985, 306 p. plus supplements.

This useful directory provides comprehensive information about the programmes and curricula in natural resources and environmental fields at 92 selected North American universities. All entries provide an outline of the curricula programmes, identification of specific academic programmes of particular interest to students from outside North America, the identification of supporting research and educational opportunities, the domestic and overseas involvement in these fields, and statements on students, faculty, climate, facilities.

The major goal of this publication is to provide a guide for developing country students to the North American academic programmes which will train them in the principles of sustainable natural resources management pertinent to their home lands. The anticipated outcome will be to strengthen the natural resource management capability of developing country resource professionals, and thereby provide greater national self reliance.

Orders to: Conservation Education and Training Program, World Wildlife Fund, 1255 23th Street NW, Washington, DC 20037, U.S.A.

Studies about Humus. Transactions of the 8th International Symposium Humus-et-Planta, Prague, August 1983. B. Novak, Editor-in-Chief. Research Institute of Crop Production, Ruzyně, Prague, 1985, 2 Volumes, 499 p.

The international symposium Humus et Planta VIII was held in August 1983. The full texts of the papers presented at this ISSS-sponsored meeting are published in the present volumes. Papers are arranged under the following subjects: structure, composition and physical features of humus substances (35 papers); geological, geographical, climatic, and earth surface effects on humus conditions (9 papers); effects of humus on soil fertility (5 papers); humus properties utilized for Soil Taxonomy (5 papers); effects of soil conditioners on soil humus (3 papers); effects of soil management (11 papers); effects of organic manures on soil and the yields of crops (20 papers); fertilizer effects on soil organic matter transformations (4 papers); mathematical models in soil humus (3 papers); biological activity and microflora (17 papers); and anthropogenic effects on soil (15 papers). The majority of papers is in English, the rest in Russian.

Requests to: available for exchange by writing to: Dr. B. Novak, Research Institute for Crop Production, Drnovska 507, 16101 Prague 6-Ruzyně, Czechoslovakia.

With Our Own Hands. Research for Third World Development: Canada's Contribution through the International Development Research Centre 1970-1985. IDRC, Ottawa, 1986, 206 p. ISBN 0-88936-460-5. Also available in French and Spanish.

This book reviews the 15-year history of a unique agency for international development that was set up in Canada in 1970. Established by the Canadian Parliament at the time when public debate on the 'Just Society' was at its peak, the International Development Research Centre (IDRC) was granted an extraordinary measure of independence from the political process, from many of the structures of government bureaucracy, and from the need to tie its assistance to domestic sources. It was also endowed with a genuinely international character in the sense that its resources could be – and virtually all would be – expended in developing countries for their benefit. Also, among development bodies, only IDRC has a sovereign and completely international Board of Governors.

The present publication contains a series of impact studies, related to projects supported by the Centre. Eight of the ten studies were carried out by specialists from developing countries. The emphasis of the Centre on building the development research capacities of developing countries themselves has helped to fill a very serious gap that grew in the years when there was far too much extractive research in developing countries by scholars from industrialized countries, well intentioned but too often resulting in knowledge built up only in the North.

This well-written and attractively produced book will be of interest to a wide audience of persons concerned with the development process.

Requests to: IDRC, Box 8500, Ottawa, Canada K1G 3H9.

Agricultural Nonpoint Source Pollution: Model Selection and Application. Developments in Environmental Monitoring 10. A. Giorgini and F. Zingales, editors. Elsevier Science Publishers, Amsterdam, Oxford, New York, Tokyo, 1986, 409 p. ISBN 0-444-99505-6.

Nonpoint source simulation programmes are part of category of loading models which describe primarily formation of runoff and generation of pollutants from a source area. They can be divided into continuous simulation models or event oriented models. They also can be based on the distribution parameter or lumped parameter concept. In scope, they range from small field size application models to mostly deterministic, process-oriented, large watershed models. The available models range from simple application of the long term form of the Universal Soil Loss Equation, to medium complexity models that use a simple hydrological component, to multiple parameter-multicomponent models requiring a large computer memory and considerable amount of field data for calibration. Models have been developed to simulate hydrology, erosion and sediment process, nutrient (fertilizer) losses, and transport of organic chemicals from agricultural watersheds.

The present volume contains most of the papers presented to a workshop in Venice in 1984. Other contributions of specialists who were not able to attend the workshop have also been included in an attempt to make the work more complete.

This collection will be useful to planners who operate in the field of agricultural diffuse source pollution, since several contributions are state-of-the-art presentations and others are specialized studies by American and European researchers.

Price: Dfl. 190.00 or US\$ 70.25.

Orders to: Elsevier Science Publishers, P.O. Box 211, 1000 AE Amsterdam, The Netherlands; In U.S.A. and Canada: Elsevier Science Publishers, P.O. Box 1663, Grand Central Station, New York, NY 10163, U.S.A.

Clover Science and Technology. Agronomy Series no. 25. N. L. Taylor, editor. American Society of Agronomy, Crop Science Society of America, Soil Science Society of America, 1985, xx + 616 p. ISBN 0-89118-083-4.

Clovers (*Trifolium*) are an important group of species of one genus that are used for hay, pasture, silage, and soil improvement. This book is an outgrowth of discussions by a group of research and extension

personnel who meet periodically under the auspices of an organization termed the Trifolium Conference. These scientists recognized that an abundant store of published and unpublished knowledge of potential value to scientists, students, technicians, and growers was available that had not been assembled in one treatise. The objective of the book is to provide a condensation of all available information on a group of species that is important to the livestock economy of the USA, Canada and other countries. The coverage is limited to use of clovers in North America, whatever their origins. The scope of the book is intended to be comprehensive and to summarize the present state of knowledge of the clovers and to provide a basis on which future knowledge can be built. However, it was impossible to consider in detail all the approximately 240 species of the genus. Therefore, most detail is given on species of agricultural importance in North America. It is not a text on methods of growing clovers, but is a scientific treatment written in a style, we hope understandable, at the college undergraduate level.

The book consists of 27 chapters contributed by authors in North America who are the most knowledgeable on the subject. The first 15 chapters are of a general nature applying to the clovers as a genus, whereas the remaining 12 deal with individual species or groups of species that are of agricultural importance in North America. Efforts were made to eliminate redundancy, but not at the expense of clarity. The contributions provide a foundation for further research into the basic, biological, and agricultural sciences which support clover production, utilization, development, and technology.

Price: US\$ 40.00, plus \$ 0.75 per book for orders outside the United States.

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

Land Clearing and Development in the Tropics. R. Lal, P. A. Sanchez and R. W. Cummings, Jr. A. A. Balkema, Rotterdam, Boston, 1986, xii + 450 p. ISBN 90-6191-536-8 (bound).

Over 11,000,000 hectares of land are cleared in the tropics every year. Too often in the past, new land has been brought under cultivation without forethought – each development scheme or agricultural project operating in an information vacuum. Now, at last, the consequences of this clearing are being considered. How much of this land will still be productive in ten years? Five years? Two years? How many of the 11 million hectares cleared last year are being properly managed today? Which techniques of clearing and management are appropriate for which conditions? And finally, is it possible that the answer to increasing food supplies lies not in clearing more land but in better management of that already cleared?

To consider the consequences of this land clearing, an international symposium was organized by the International Institute for Tropical Agriculture, Ibadan, in November 1982. The nearly hundred scientists and practitioners, representing a range of disciplines and interests, came from some 25 countries in primarily tropical areas. Four days of technical discussions were followed by two days of summation and of planning for succeeding implementation. The present volume contains the edited papers of this most important symposium. Some key points to make land settlement schemes succeed are: (1) In general, the most economical and viable means of accelerating agricultural development in tropical areas is to improve efficiency on existing farm lands. (2) To identify new lands suitable to development, soil surveys, land evaluation, and land-use planning should be carried out. (3) The techniques of land clearing and post-clearing management used will depend on differences in land types, ecosystems, and socio-economic conditions. (4) Technologies developed at research institutions studying sound land clearing and post-clearing management should be validated and adapted in a number of representative locations. (5) Methods and effects of land clearing where large-scale schemes have been undertaken must be monitored to help policy makers avoid past negative social, economic, and environmental consequences frequently associated with efforts to expand the land frontier. (6) Ambitious training programs are needed to develop the manpower to apply existing new knowledge to clearing and post-clearing management.

The conference identified a research agenda to improve understanding of how land clearing might best proceed. And steps are being taken to secure funding to carry out this research. As a direct result of the conference, the International Board for Soil Research and Management (IBSRAM) will support and coordinate research on land clearing and development.

The well-produced and illustrated book has 30 papers, and conclusions and recommendations in the field of minimizing environmental damage, land misuse and economic waste by land clearing, guidelines for clearing, development and protection of tropical lands for farming, and research priorities related to land clearing and development in the tropics.

Price: Dfl. 150.00.

Orders to: A. A. Balkema, P.O. Box 1675, 3000 BR Rotterdam, The Netherlands. In U.S.A. and Canada: A. A. Balkema Publishers, P.O. Box 230, Accord MA 02018, U.S.A.

Rates of Chemical Weathering of Rocks and Minerals. S. M. Colman and D. P. Dethier, editors. Academic Press, Orlando, London, 1986, xv + 603 p. ISBN 0-12-181490-4.

Weathered rock and minerals are nearly ubiquitous on the earth's surface. Interest in rates of weathering is widespread and diverse in many earth science fields, including geomorphology, mineralogy, geochemistry, Quaternary geology, and soil science. The processes and rates of alteration of rocks and minerals from their original state to phases that are more stable at the earth's surface are basic to earth science research. Many questions concerning rates of weathering, kinetic mechanisms, nature of secondary products, and

the importance of chemical weathering in landscape evolution remain unanswered. Important current research topics include the precise workings of weathering processes, the degree to which these processes can be theoretically modeled, the effect of a variety of environmental conditions on weathering rates, the degree to which natural weathering systems approach equilibrium, and the effect of nonequilibrium conditions on weathering kinetics. More specific examples of outstanding problems are far too numerous to list here.

In addition to widespread academic interest in rates of weathering, this topic has a broad range of practical applications. Rates of weathering are frequently used to estimate ages of weathered materials where studies of geologic hazards and geomorphic processes require that ages of surfaces or surficial deposits be known. Assessment of volcanic hazards, the recency of fault motion, and the significance of contemporary erosion rates are examples of important applied research in many countries. Most dating methods require special materials or conditions; in contrast, weathering profile and weathered materials can be found in most terrestrial environments.

Chemical weathering has important implications for many practical problems. Weathering processes affect the distribution, development, nutrient content, and stability of agricultural and forest soils, which form the economic base for many nations. Contemporary economic concerns related to weathering rates include the effect of agricultural and logging practices on uptake and pesticide effectiveness, and the significance of acid deposition to the chemistry of forest and agricultural soils. Rates of weathering and the sorption properties of weathered products also strongly influence the chemistry of surface and subsurface waters.

A variety of methods allow quantification of the influence of time, lithology, climate, and other factors on rates of chemical weathering; this book is organized around those methods.

The papers concentrate on current work, with emphasis on rates of weathering, mostly those associated with near-present conditions and relatively short geological time intervals. Most of the papers focus on processes and rates at which materials weather or at which weathering products form; several papers discuss properties of altered materials and alteration products.

Price: US\$ 95.00.

Orders to: Academic Press, Inc., Orlando, FL 32887 U.S.A.; or: Academic Press Inc., 24-28 Oval Road, London NW1 7DX, England.

Quality of Soil Maps. A Comparison of Survey Methods in a Sandy Area. Soil Survey Papers, No. 15, B. A. Marsman and J. J. de Gruijter. Netherlands Soil Survey Institute, Wageningen, 1986, 103 p. ISBN 90-327-0217-3.

In recent decades much research in pedology has centred on the construction of classification systems. We have seen a distinct development from descriptive, physiographic systems to systems based on morphometrically defined soil properties. A soil classification should not only name and order individual soils but also form the basis for the making of soil maps. Since the early seventies there has been increasing emphasis on the quality of soil maps based on these morphometric classifications. Considerable research efforts has been directed towards the quality of soil maps, particularly in England, USA and Canada. At first, the studies were concerned with the purity of the map: the extent to which the content of the delineated areas corresponded to the specifications in the map legend. Later, the homogeneity of the mapping units attracted attention.

The increased emphasis on the quality of soil maps is a logical consequence of the morphometry of the classification systems. Soil maps made on the basis of morphometrically defined criteria create a need for information on the quality of those criteria. Another argument for this is the increasing detail in the definition of the taxonomic units. Some believe that this increasing detail actually means that many delineated soil units are complex units. In addition, the development of morphometrically defined criteria makes it possible to quantify survey quality.

In the early seventies the Netherlands Soil Survey Institute (Stiboka) began preliminary studies on the purity of some important mapping units. In 1975 the study was extended to include the quality of the most common types of soil maps. The aim of the study was to obtain information on the quality of soil maps made by traditional methods and soil maps compiled by alternative means. The expanding possibilities for automation both in map production and data handling by users may offer opportunities for changes in existing methods. But before new methods are introduced, it is necessary to evaluate the impact any changes would have on map quality. It was hoped that the results of the project would also indicate whether map quality can be improved.

This publication reports the results of the Stiboka project. The basis of the project is formed by six soil maps at a scale of 1:50,000 based on the legend of the Soil Map of the Netherlands and six soil maps at a scale of 1:10,000 of a smaller subarea based on the detailed map legend used for commissioned surveys. Four survey methods were applied to compile the soil maps, consisting of combination of two alternative sampling procedures (purposive or random) and two alternatives for the delineation of soil boundaries (field or proximal). Randomly selected soil profile descriptions were used as test samples for quality checks. On the basis of these quality checks, estimates of 25 quality criteria were made. The appendix contains seven of the investigated soil maps and their respective legends.

Price: Dfl. 35.00 plus postage.

Orders to: Stiboka, P.O. Box 98, 6700 AB Wageningen, the Netherlands.

Soils of India and their Management. Second edition. The Fertiliser Association of India, New Delhi, 1985, 445 p.

One of the important activities of the Fertiliser Association of India is to bring out information for the use of all concerned involved in overall development of agriculture.

Earlier, the book 'Soils of India' was published in December 1972. All copies of the publication have been exhausted. And in last 10 years or so a lot of changes in soil fertility and fertiliser use research, development, promotion and extension have taken place. It has, therefore, become necessary to revise the first edition.

To ensure optimum agricultural production, first it is imperative to know the basic facts about our soil and then its management with judicious use of fertiliser to achieve high productivity. A fertiliser is and will remain a key input in agricultural production, it is necessary to know all aspects of fertiliser application. Although excellent work has been done on soil and fertiliser management, the information is scattered in various publications. The present book is a record of scientific contributions made by the research workers in different States of India. It contains invited articles from all the States and most of the Union Territories and deals with the present status of knowledge.

The chapters comprise a brief account of geographical situation; physiography, climate and vegetation; soils and land use capability classification; irrigation and cropping pattern; extent and delineation of problem soils; soil and fertiliser management (soil fertility status, deficiency and toxicity of secondary and micronutrients, response of major crops to fertilisers, fertiliser recommendations for important crops, management of problem soils and so on); sources of irrigation water and water quality; technology for efficient fertiliser use, and priorities for future (missing links in available technology and priority areas for soil and fertiliser use research). Unfortunately, the small-scale soil maps of the States and Union Territories were too much reduced.

Price: US\$ 10.00 plus \$ 6.00 for airmail postage.

Orders to: The Secretary, The Fertiliser Association of India, Near Jawahar Lal Nehru University, New Delhi 110067, India.

Biosalinity in Action: Bioproduction with Saline Water. Developments in Plant and Soil Science, Volume 17. D. Pasterna and A. San Pietro, editors. Martinus Nijhoff Publishers, Dordrecht, 1985, xix + 369 p. ISBN 90-247-3159-3 (this volume); 90-247-2405-8 (series).

Historically, scientists and laymen have regarded salinity as a hazardous, detrimental phenomenon. This negative view was a principal reason for the lack of agricultural development of most arid and semi-arid zones of the world where the major sources of water for biological production are saline.

The late Hugo Boyko was probably the first scientist in recent times to challenge this commonly held, pessimistic view of salinity. His research in Israel indicated that many plants can be irrigated with saline water, even at seawater strength, if they are in sandy soil – a technique that could open much barren land to agriculture.

A decade later, three members of the United States National Science Foundation (NSF) formulated the 'Biosaline Concept'; namely, that 'poor soils, high solar insolation and saline water, which prevail in arid lands, should be viewed as useful resources rather than as disadvantages, and that these resources can be used for non-traditional production of food, fuels and chemicals.'

The First International Workshop on Biosaline Research was convened at Kiawah Island, South Carolina, in 1977. This workshop focussed primarily on an assessment of the state of the science in Biosaline Research. It permitted a bold exchange on a wide scientific front by many researchers, but little information on actual applications could yet be reported.

The Second Workshop convened in la Paz, Mexico, in 1980; the Third Workshop took place in Beer-Sheva, Israel in 1984. While the first two workshops addressed mainly the science of Biosaline Research, this Third Workshop was dedicated to the practical application of the Biosaline Concept.

This volume is the proceedings of the Third Workshop and is mainly composed of review articles and is divided into five sections: 1. Mechanisms of salt tolerance in algae and terrestrial plants. 2. Production of micro and macroalgae with saline water. 3. Crop production with saline water. 4. Seawater agriculture. 5. Mariculture.

The section on mechanisms of salt tolerance presents the most contemporary knowledge on the physiology of salt tolerance in crop plants, halophytes and algae at all levels of cellular organization. The second section provides up-to-date information on production and utilization of algae as sources of both foods and valuable biochemicals. A relatively large part of the third section is devoted to the genetic approach to increasing the salt tolerance of crop plants. Also reviewed are water management, crop management, crop nutrition, and the effects of salinity on the quality of agricultural products. The fourth section presents current research in irrigation of halophytes with seawater and their development into completely new crops. The final section discusses marine fish production in Japan.

This volume should be useful not only to scientists but also to planners and decision-making authorities as a valuable aid with which to promote the development of the world's arid zones.

Price: Dfl. 200.00; US\$ 76.50; £ 55.50.

Orders to: In the U.S.A. and Canada: Kluwer Academic Publ., 190 Old Derby Street, Hingham, MA 02043, U.S.A.; U.K. and Ireland: MIT Press Ltd., Falcon House, Lancaster LA1 1RN, U.K. Elsewhere: Kluwer Academic Publishers Group, Distribution Center, P.O. Box 322, 3300 AH Dordrecht, the Netherlands.

Proceedings of the Soil Dynamics and Land Use Seminar, Blenheim, May 1985. I. B. Campbell, editor. New Zealand Society of Soil Science, Lower Hutt, and New Zealand Soil Conservators Association, 1985, 412 p. ISBN 0-473-00327-9.

This publication constitutes the proceedings of a symposium on soil dynamics and land use, held in Blenheim, New Zealand, in May 1985. The objectives of the symposium were to promote dialogue, to exchange ideas, and to widen perspectives between the many disciplines that co-operate and work together in the fields of soil conservation and soil science.

The theme of 'soil dynamics and land use' emphasised the dimension of time and provided opportunity to focus on the rates of soil processes – 'how fast' and 'how slow' processes can be; processes such as soil weathering and formation, erosion, organic cycling, water movement, chemical and physical changes with land use and management, etc. The book contains 30 papers on these items.

Price: NZ\$ 20.00 plus postage

Orders to: New Zealand Associations of Soil Conservators, c/o P.O. Box 145, Blenheim, New Zealand.

Recent developments in erosion and sediment yield studies. Technical Documents in Hydrology. R. F. Hadley, R. Lal, C. A. Onstad, D. E. Walling and A. Yair. International Hydrological Programme and Unesco. Unesco, Paris, 1985, 127 p.

Erosion and sediment yield studies have incorporated many new advances and developments during the last decade. These include improvements in measurement techniques and data collection, as well as overall advancement in methods of data analysis, interpretation, and modelling.

The present report brings together a summary of recent development in the fields of erosion and sediment yield. It is not intended to be a textbook or a technical guide for studies and scientists in these fields. It is rather a review of the results of recent studies and a compilation of reference lists of published papers that can be studied for a more complete description of methodologies and results.

The report is arranged in five chapters. In addition to the Introduction, the major divisions are: (1) Erosion processes and sediment sources; (2) Sediment transport and delivery; (3) Sediment yields; and (4) Perspectives, or research needs. A list of pertinent references is appended at the end of the report by chapter for the convenience of the reader. It should also be noted that where papers are quoted or equations referenced, the units of measurement (English or SI) used by the author have been retained. The report also is restricted to the consideration of particulate loads. Dissolved loads are beyond the scope of this report and were the subject of a Symposium at the Hamburg General Assembly of the International Association of Hydrological Sciences (IAHS) in August 1983 (IAHS Publication No. 141).

Requests to: see below.

Methods of Computing Sedimentation in Lakes and Reservoirs. S. Bruk, Rapporteur. Unesco, Paris, 1985, 224 p.

The computation of reservoir sedimentation is in the present report considered as a tool of engineering predictions in the planning, design and operational phases of reservoir projects. Being oriented towards definite engineering purposes, the computations thus require a clear statement of the objectives of predictions, i.e. of what the technical and economical importance of the problem is, what physical phenomena should be modeled, what engineering measures should be planned based on the predictions and what kind of field measurements can be made in support of the computations.

In addition to only reviewing computational methods, the report also considers all the other aspects of reservoir sedimentation which are essential from the engineering point of view. Thus, the technical and socio-economic impacts of reservoir sedimentation are discussed in Chapter 1; the physical phenomena related to sedimentation in lakes and reservoirs are described in Chapter 2; measurement methods and instrumentation are reviewed in Chapter 3; the methods of preserving the reservoir capacity and recovering the lost storage are dealt with in Chapter 4 while the principal methods of engineering predictions are in the background of the foregoing chapters and are given in Chapter 5. Finally, the principal findings of the report are summarized in Chapter 6 which also contains a proposal of the follow-up activities for the 3rd phase of the International Hydrological Programme.

Requests to: The Director, Division of Water Sciences, Unesco, 7, place de Fontenoy, F-75700 Paris, France.

Research and Training for Desertification Control: The United Nations Effort. R. Baker. UNEP, Nairobi, 1985, 68 p.

This report contains four chapters: (1) Guidelines for the evaluation of research and training for desertification control. (2) Current research and training activities under the aegis of the UN system. (3) Draft programme for research and training. (4) Modalities for implementation. The annexes contain gaps in research, as identified by Unesco, by FAO and by a Workshop at Unesco, Paris, in 1982, in which participated members of the Inter-Agency Working Group on Desertification, other UN bodies, research and training institutions, scientific associations, etc.

Requests to: Dr. Daniel Stiles, Programme Officer, Desertification Control Programme Activity Centre, UNEP, P.O. Box 30552, Nairobi, Kenya.

Toward a More Sustainable Agriculture. R. P. Poincelot. AVI Publishing Company, Westport, 1986, xiv + 241 p. ISBN 0-87055-518-9.

The USA's grandest enterprise is agricultural industry. It is second to none in terms of assets, workers, and exports. Agricultural success has become an accepted fact and is taken for granted by the majority of the American public. Few believe or are even willing to consider that the continued future success of this industry is threatened. Yet threatened it is. The resource base of agriculture is becoming diminished through overuse and environmental misuse. A further complication is the competition for agricultural resources by other users. The energy, soil, and water resources cannot sustain agriculture into the far future at their present rate of use.

Something must be done to bring about public awareness and support for the changes needed to move toward a sustainable agriculture. More research and funding must be directed toward this end.

Something is being done. The agricultural system in the U.S.A. is in a transitional stage. Traditional agriculturists are changing some practices and their attitudes. Alternative systems of agricultural production have appeared. In the hopes of reaching many, this book was written for several audiences in the agricultural and nonagricultural communities. These groups include, but are not restricted to, the educators, extension workers, farmers, food and fiber processors, researchers and students in the agricultural community, and those beyond who share an interest in and a concern for agriculture. The latter include civic-minded citizens, planners and policy makers, politicians, and those involved in environmental or ecological activities. This hardbound book is well-illustrated and should also be of interest for persons outside North America.

Price: US\$ 28.50.

Orders to: AVI Publishing Company, P.O. Box 831, Westport, CT 06881, U.S.A.

Erosion Control ... A Challenge in Our Time. C. Forrest, editor. International Erosion Control Association, 1985, 222 p.

This publication constitutes the proceedings of the 14th Conference of the International Erosion Control Association, which was held in San Francisco, February 1985. It contains 25 papers, 23 on several aspects of erosion and its control in the U.S.A., and papers from Iran and Bolivia.

Requests to: Carol Forrest, Report Editor, Woodward-Clyde Consultants, 3467 Kurtz Street, San Diego, CO 92110, U.S.A.

Guidelines for Soil Survey and Land Evaluation in Ecological Research. MAB Technical Notes 17. R. F. Breimer, A. J. van Kekem, and H. van Reuler. Unesco, Paris, 1986, 124 p. and 1 map. ISBN 92-3-102366-7.

A primary direction in the Man and the Biosphere Programme (MAB) over the last 10 years has been to establish an international network of integrated pilot projects on ecological research and demonstration in natural resources management. These projects have focussed on identifying the physical and biological characteristics of natural ecosystems and the interrelationships of these with the cultural, economic and social aspects of the human system built upon them. The role of soil sciences is a major one in this ecological research, given the importance of soil survey and assessment in the whole process of land-use planning and natural resources management.

An underlying concern in assessing the consequences of human actions on the environment is that of land transformation and its long-term impacts. Man's efforts to improve resource development have led to the complete transformation of many ecosystems. The drainage of swamplands, irrigation of arid lands, deforestation of highlands and tropics, to name just a few activities, have greatly altered the structure and functioning of the original ecosystems. On a less immediately visible level, the introduction of chemical fertilizers, pesticides and pollutants have also caused major transformations in ecosystems. Modifications of the physical, chemical, hydrological and biological properties of soils are essential parts of this transformation. Thus, it is clear that a knowledge of the soils is essential in assessing changes in ecosystems.

This being said, the field of soil sciences and its application is one of great variability in methods, terminology and approach, and it is often difficult to compare information gathered in different parts of the world. This Technical Note was therefore developed in cooperation with the International Soil Reference and Information Centre (ISRIC) in Wageningen, with a twofold purpose: to help define the role of soil sciences in ecological research, and to provide an experimental base for comparison of soil data gathered in MAB pilot projects through the world under different soil classification systems. The results of soil surveys produced at each site stand on their own, but are also useful as a basis for comparisons within similar ecological zones, as well as between sites and regions.

The Technical Note is based on five years of research in Africa, Latin America and Southeast Asia and provides guidelines for standardizing and ensure compatibility of soil data gathered under different projects, systems and geographical regions throughout the world. It addresses problems of soil classification survey and mapping as well as land evaluation in an overall ecological context. The latter aspect makes this work a valuable tool not only in soil research and land use planning but also in the broader realm of environmental management. Addressed primarily to scientist or those with a basic knowledge of soils, it provides a practical means for the implementation of standardized soil survey and land evaluation methods in ecological research.

Requests to: MAB Secretariat, Unesco, 7, place de Fontenoy, F-75700 Paris, France.

An evaluation of the agricultural potential of the Highveld Region in terms of dryland cropping and livestock production. Technical Communication 185, J. J. Scheepers, J. A. Smit, and B. P. Ludick. Dept. of Agriculture, Rep. of South Africa, 268 p. ISBN 0-621-082597.

The agricultural potential of the Highveld Region is described in terms of rain-fed crop production and animal production. The Region comprises 219 land types which are grouped into 57 reasonably homogeneous farming areas. A large number of ecotopes are defined using land type data. The potential yields of maize, grain sorghum, sunflowers, dry beans, potatoes, wheat and groundnuts for these resource units, are calculated using yield models.

Optimum land use has been the accepted policy of the Department of Agriculture since 1970. The concept 'optimum land use' includes, inter alia, six steps, namely: the demarcation of reasonably homogeneous areas in respect of agricultural resources; the establishment of yield norms and production techniques; the establishment of adapted branches of farming; the development of persuasion programs to implement adapted branches of farming in practice; evaluation to measure progress in the application of optimum land use; and purposeful research to exploit the agricultural potential of areas on an on-going basis.

This study deals mainly with the first three steps of optimum land use. The point of departure is that the natural environmental factors from the basis of optimum land use. It therefore follows that farming enterprise planning for the short, medium and long term depends of an environmental approach.

In the study an attempt was made to systematise resource information on an area basis and to describe it in terms of locality, size, broad macroclimate and important soil features as reflected by series and depth phases. Yield potential for the major crops grown in the area is given for identified resource units. Although attention is mainly given to dryland cropping, grazing capacities were allocated to areas not suitable for crop production. The animal potential is given as the number of large stock units that can be carried per area.

Requests to: Free of charge. Director, Div. of Agricultural Information, Private Bag X144, Pretoria 0001, Rep. of South Africa.

Barley. Agronomy Volume 26. D. C. Rasmusson, editor. American Society of Agronomy, Crop Science Society of America and Soil Science Society of America, Madison, 1985, xiv + 522 p. ISBN 0-89118-085-0.

Barley is the world's fourth most important cereal crop, after wheat, maize, and rice. Roughly, its production is two-fifth that of wheat. Barley was one of the earliest crops to be domesticated and has been cultivated since the beginnings of civilization. It is grown over a broader environmental range than any other cereal. Much of the world's barley is produced in regions with climates unfavorable for production of other major cereals. It has persisted as a major cereal crop through so many centuries because it has three unique characteristics: (i) broad ecological adaptation, (ii) utility as a feed and food grain, and (iii) superiority of barley malt for use in brewing.

Throughout barley's long history, its diversity and uniqueness have evolved and its importance in agriculture has been maintained. During the past two decades, the harvested area of barley has increased faster than that of wheat or rice; yield and production have increased faster than those of rice, but not as rapidly as those of wheat or maize.

The 16 chapters contain information on all aspects of barley. It emphasizes barley in North America, specifically the U.S.A. and Canada. Adaptation, distribution, botanical relationships, and germplasm resources are considered in Chapters 1, 2, and 3. Morphology, anatomy, and physiology are the subjects of Chapters 4 and 5. Cytogenetics, genetics, and wide crosses are discussed in Chapters 6, 7 and 8. Chapters 10 and 11 review diseases and insects that attack barley. In Chapters 9 and 11, cultivar development and breeding to control pests are considered. Malting and brewing quality and nutritional quality are the subjects of Chapters 13 and 14. The final two chapters deal with cultural practices and marketing. A reference list, which will enable readers to pursue subjects in areas of special interest, is appended to each chapter.

This 26th monograph in the series Agronomy should be of interest to researchers, teachers, students, producers and users of the crop, and many others.

Price: US\$ 40.00, plus \$ 0.75 per book on 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-based Agrotechnology Transfer. J. A. Silva, editor. Benchmark Soils Project. Hawaii Institute of Tropical Agriculture and Human Resources, University of Hawaii, Honolulu, 1985, xvii + 269 p.

The purpose of the Benchmark Soils Project (BSP) was to test an innovative approach to agrotechnology transfer designed to assist developing countries in appropriately utilizing their land resources for increased and better quality food production. This approach to agrotechnology transfer from one tropical region to another tropical region on the basis of Soil Taxonomy at the soil family level of classification bypasses three major constraints: scarcity of qualified research personnel, insufficient capital, and, above all, time needed to close the widening gap between agroproduction and food requirements.

The BSP was carried out in Hawaii, Puerto Rico, Brazil, Cameroon, Indonesia and the Philippines, on Distrandrepts, Eutrostoxy and Paleudults. The focus was the acceleration and reduction of cost of agricultural planning and development in developing countries through the process of agrotechnology transfer. The objectives of the project were: 1. to determine scientifically the transferability of agroproduction technology

among tropical and subtropical countries; 2. to assist tropical countries in assessing the potential of upland areas for intensive cropping and intensive soil management; and 3. to demonstrate the value of soil and land classification in formulating agricultural development plans in selected areas.

The present final report of the Benchmark Soils Project is divided into three parts. The first is the major report of project activities in fulfilling its objectives and includes four sections: principles and concepts, research methodology, quantitative evaluation of the transfer hypothesis, and matching maize requirements to the agro-environment. The second – additional agrotechnology transfer studies – includes four sections: phosphorus management in benchmark soils, crop performance in benchmark environments, utilization of the Benchmark Soils Network, and matching crops and environments by Soil Taxonomy. The results of investigations undertaken to clarify observations and questions raised during project activities are presented in this part. These studies provided information on the effects of the characteristics of the three soil families on crop performance, fertilizer availability, and susceptibility to erosion. The third part – executive summary – highlights the accomplishments of the Benchmark Soils Project and summarizes major results of the other sections.

The information presented would be of value to soil and crop scientists, planners, government agencies, and extension personnel.

Requests to: Publications Staff, IBSNAT, Dept. of Agronomy and Soil Science, College of Tropical Agriculture and Human Resources, University of Hawaii, Honolulu, Hawaii 96822.

Micronutrients in Tropical Food Crop Production. Developments in Plant and Soil Sciences, Volume 14. P. L. G. Vlek, editor. Martinus Nijhoff/Dr. W. Junk Publishers, Dordrecht, Boston, Lancaster, 1985, viii + 260 p. ISBN 90-247-3085-6.

The mission of the International Fertilizer Development Centre (IFDC) is to increase food production through the improvement of fertilizers and fertilizer practices for the developing countries with special emphasis on tropical and subtropical agriculture. The principal aim is to ensure that fertilizer technology is not a limiting factor to food production in those regions. Although the full extent to which deficiency of micronutrients hampers food production is yet unknown, there is ample evidence that problem areas exist and more will be identified as crop production is intensified and marginal lands are exploited.

The gravity of micronutrient deficiency as a limiting factor to crop production varies from crop to crop and from soil to soil. The effects may range from slight yield reductions to complete crop failure. While the economic impact of omitting micronutrients in seriously affected areas is convincing, it is difficult to estimate the yearly loss in crop production due to unsuspected micronutrient deficiency. Active soil and crop testing programs in regions with advanced agricultural systems are aimed at recognizing micronutrients as a limiting plant nutrient in time to allow corrective measures and prevent yield loss. Successful micronutrient monitoring systems are generally limited to developed economies or to developing economies producing export cash crops.

The extent to which micronutrient fertilizers are used on food crops in the tropics and subtropics is very limited and is no indication of the extent to which micronutrient deficiencies occur. On the other hand, the increased number of published papers on micronutrients in some countries should not be interpreted as an index of the problem. In India alone, as many as 800 papers appeared during the seventies. With such conflicting indicators it is difficult to assess the future role of micronutrient fertilizers in the tropics and subtropics. For this reason IFDC conducted a survey of micronutrient problems. The results of this survey and related contributions from invited authors have been collected in this monograph.

Price: Dfl. 160.00; US\$ 52.00; £ 44.50.

Orders to: In U.S.A. and Canada: Kluwer Academic Publishers, 190 Old Derby Street, Hingham, MA 02043, U.S.A. In the U.K. and Ireland: MTP Press Ltd., Falcon House, Queen Square, Lancaster, LA1 1RN, U.K. Elsewhere: Kluwer Academic Publishers Group, Distribution Centre, P.O. Box 322, 3300 AH Dordrecht, the Netherlands.

Scientific Basis for Water Resources Management. IAHS Publication No. 153. M. Diskin, editor. International Association of Hydrological Sciences, Wallingford, 1985, xi + 446 p. ISBN 0-947571-50-7.

About 30 years ago, the field of water resources management was first developed as a scientific and applied discipline. Work in this field since then has enormously increased our insight and understanding of the way in which complex water resources systems are to be managed, considering the roles and interactions of many components: the natural physical world, manmade engineering works, economic, environmental, social, institutional, and political aspects. With the developments in operations research and the proliferation of computers, researchers and practitioners in water resources management directed their efforts to developing more and more sophisticated models, designed to aid in management of water resources systems.

While this work has been progressing at an impressive rate, it also became evident that at least some of it was based on an inadequate understanding and/or an improper representation of the real world in the models. Some of these deficiencies are due to limitations of the modelling methodologies, limitations which are being continuously diminished and eliminated. More important deficiencies, however, have been caused by an overenthusiasm to model, with insufficient attention and effort devoted to understanding the physical, economic and social world which was to be captured in these models.

Systems analysis methodologies have matured, and the computers needed to implement them are on our desks. It is time to go back and re-examine our understanding of the basics, and the way we model them for management. As was stated in the announcement for this symposium: 'The objective ... is to present and discuss topics in those areas of hydrology and water resources which provide the basis for decision-making and management. Emphasis is placed on the scientific basis for decision-making, but the symposium will deal equally with understanding how knowledge of the basic phenomena serves to rationalize management'.

The papers in this publication were presented at a symposium, held in Jerusalem in September 1985. They cover many areas, including: the importance and role of data and information; forecasting; hydrology of arid and humid areas; rainfall-runoff and basin processes; groundwater: forecasting water levels and contaminant transport, identification of parameters, missing data, management models; lakes: quantity and quality, management; streams: forecasting flows, quality aspects; water quantity and quantity management in regional water resources systems; approaches and models for water resources management; and approaches and methodologies for water policy formulation and evaluation.

Price: US\$ 42.00.

Orders to: Office of the Treasurer IAHS, 2000 Florida Avenue, N.W., Washington, DC 20009, USA; IUGG Publications Office, 39 ter Rue Gay-Lussac, F-75005 Paris, France; or: IAHS Editorial Office, Mrs. P. Kisby, Institute of Hydrology, Wallingford, Oxon OX10 8BB, England.

Hydrological Application of Remote Sensing and Remote Data Transmission. IAHS Publication No. 145. B. E. Goodison, editor. International Association of Hydrological Sciences, Wallingford, 1985, xviii + 684 p. ISBN 0-947571-20-5.

The papers presented in this publication were prepared originally for presentation at the Symposium on Hydrological Applications of Remote Sensing and Remote Data Transmission, convened at Hamburg, in August 1983, as part of the XVIIIth General Assembly of the Intern. Union of Geodesy and Geophysics.

A total of 106 papers were accepted for presentation in 19 oral and three poster paper sessions. Authors from 22 countries were represented on the programme which covered descriptions of instrumentation and applications of remote data transmission and applications of many different remote sensing techniques as related to all phases of the hydrological cycle. After review approximately 60% of the papers were accepted for publication in this Proceedings, organized in the following sections: World Meteorological special sessions on existing and future satellite systems (8 papers); data transmission (17 papers); remote sensing: precipitation (10 papers); remote sensing: snow and ice (12 papers); remote sensing (5 papers); remote sensing: soil moisture, groundwater, wetlands (6 papers); and: remote sensing: hydrological modelling, water planning and management (10 papers). Most papers are in English, a few in French; all papers have abstracts in both languages.

Price: US\$ 48.00.

Orders to: see below.

Scientific Procedures applied to the Planning, Design and Management of Water Resources Systems. IAHS Publication No. 147. E. Plate and N. Buras, editors. International Association of Hydrological Sciences, Wallingford, 1985, xii + 647 p. ISBN 0-947571-20-5.

This publication contains the upgraded versions of papers, originally presented at a symposium of the International Commission on Water Resources Systems of the IAHS, during the General Assembly of the International Union on Geodesy and Geophysics in Hamburg, August 1983. Papers are presented in the following sections: hydrological processes at basin scale (15 papers); hydrological risk and reliability (15 papers); coupling of water quantity and water quality studies (5 papers); hydrology of irrigated lands (6 papers); water projects in developing countries (5 papers); hydrological aspects of integrated river basin development (6 papers). Papers, except for one, are in English; all have abstracts in English and French.

Price: US\$ 48.00.

Orders to: Office of the Treasurer IAHS, 2000 Florida Avenue, N.W. Washington, DC 20009, USA; IUGG Publications Office, 39 ter Rue Gay-Lussac, F-75005 Paris, France; or: IAHS Editorial Office, Mrs. P. Kisby, Institute of Hydrology, Wallingford, Oxon OX10 8BB, England.

Agricultural Water Management. A. L. M. van Wijk and J. Wesseling, editors. A. A. Balkema, Rotterdam and Boston, 1986, vii + 325 p. ISBN 90-6191-639-9.

In the framework of the Land Use and Rural Resources Programme of the Commission of the European Communities problems of water management have been dealt with from an early stage. The attention there was mainly focussed on drainage problems in the so-called disadvantaged areas. The proceedings of the first Seminar on Land Drainage, organized in Cambridge (Gardiner, 1982 also published by Balkema) contain many contributions on drainage and reclamation of soils under difficult conditions (low permeability, seepage). Other contributions treated the effect of drainage on crop yields and farm income and the development of new drainage techniques. The seminar also offered a good opportunity to discuss future research and development needs on the bases of a presentation of each country's position. In a subsequent workshop in Brussels in 1982 these discussions were continued and widened to subjects that got little attention in the Cambridge seminar, such as irrigation and environmental effects.

The (unpublished) results of the Brussels workshop were accepted by the Programme Committee on Land and Water Use and Management. They were very useful in listing the fields of research that could be considered as important for many countries of the EC; The programme of the EC-workshop on Agricultural Water Management, held at Arnhem in June 1985, was drafted on the basis of agreement of priorities reached in the preceding meetings.

Water management may greatly influence types of crops to be grown, farm structure, costs of farm operations, income from and employment in agriculture. Additional problems may arise when available water resources are scarce. Water management measures for agriculture then often have a negative influence on natural vegetation and fauna. This book contains reviews by experts from throughout the European Community, discussions, conclusions and recommendations on agricultural water management research subdivided into the following topics: Drainage and reclamation of soils with low permeability; Effects of drainage and/or irrigation on agriculture; Installation and maintenance of drainage systems; Regional and local water management systems; Effect of agriculture on its environment. It therefore presents an overall view of the current problems in agricultural water management in the European Community.

Price: Dfl. 95.00.

Orders to: in USA and Canada: A. A. Balkema Publishers, P.O. Box 230, Accord, MA 02018, USA. Elsewhere: A. A. Balkema, P.O. Box 1675, 3000 BR Rotterdam, the Netherlands.

Conserving Soil. Insights from Socioeconomic Research. S. B. Lovejoy and T. L. Napier, editors. Soil Conservation Association of America, Ankeny, 1986, xii + 155 p. ISBN 0-935734-12-0.

Conservationists have long sought the ultimate technology for protecting the land from soil erosion. Of late, however, many conservation professionals have come to realize that government policies, the way in which programs are implemented, and human behaviour are often as important as technology. More emphasis has been given to policy development and the implementation of conservation as a result.

Methods exist to control soil erosion and to protect soil and water resources. Agricultural scientists have known about these methods for decades. But many of the technologies and farming practices advocated by agricultural scientists are not used by farmers and ranchers in the United States. Why? Some researchers question the applicability of the technologies. Other suggest the lack of adoption is a result of conflicting government policies or inadequate conservation programs.

Another way of looking of this issue is to realize that technology is a necessary condition for conserving soil but not a sufficient condition. Most people now recognize the importance of access to information, the role of institutions, and the barriers to the wise use of soil and water resources. Social scientists, responding to this recognition, have initiated research on many of the behavioral aspects of soil conservation.

One group of social scientists in the north central region of the United States met in the early 1980s to discuss the commonalities of their research and design strategies for coordinating those efforts. As a result of the interest demonstrated by these scientists, a regional research project came into being. The activities of this project ultimately led to a national symposium, 'Soil and Water Conservation: Implications of Social and Economic Research for Policy Development and Program Implementation', held in Zion, Illinois, in June 1985.

A major purpose of the symposium was to examine the state of the art in socioeconomic research on soil conservation to determine why many farmers do not adopt erosion control practices. The focus of the symposium was on three broad areas of concern:

1. Effects of institutional environments on conservation behaviour, including the effects of macro-economic and macro-social factors, factors related to the structure of agriculture, and the impacts of interorganizational relationships.
2. Types of information needed to make conservation decisions and the way that sources of information affect conservation behaviour.
3. Social and institutional barriers to the adoption of conservation practices.

The book presents the main issues addressed by the presentors at the symposium. It also presents the reactions of a selected panel of conservation professionals and summaries of discussion-group sessions attended by symposium participants.

Price: US\$ 8.00.

Orders to: Soil Conservation Society of America, 7515 N.E. Ankeny Road, Ankeny, Iowa 50012, USA.

Tropical Forests: A Call for Action. Report of an International Task Force, convened by the World Resources Institute, the World Bank, and the United Nations Development Programme. World Resources Institute, Washington, 1985, 124 p. in three parts. ISBN 0-915825-10-4.

Tropical forests are one of the earth's most valuable natural resources. Throughout history, they have been essential sources of food, fuel, shelter, medicines, and many other products. They sustain people and their environments by protecting soil and water resources and providing habitat for an estimated 50% of the world's plant and animal species. It is likely that tropical forests also influence regional and global climate.

Because tropical forests benefit people in so many ways, the alarming rate of forest destruction should be a matter of grave concern. Every year more than 11 million hectares – an area larger than Austria – is lost.

Scientists estimate that 40% of the biologically-rich tropical moist forests have been cleared or degraded already. In many developing countries they will all but disappear in two or three decades if present trends continue.

Despite this prognosis for tropical forests, the basis for hope is strong. Deforestation can be arrested and, ultimately, reversed. Decades of experience have demonstrated many successful solutions to deforestation and related land misuse. However, these efforts have been isolated and far too small to address the problem.

This positive conviction spurred the World Resources Institute (WRI), in cooperation with the World Bank, the United Nations Development Programme, and bilateral aid agencies, to launch this major initiative in tropical forest conservation and development. *Tropical forests: A Call for Action* is the report of a WRI Task Force of nine world leaders in agriculture, forestry, and conservation.

The present publication focuses on translating known solutions and strategies into a five-year programme of accelerated action (1987-1991) that would lay the groundwork for longer term investment.

Examples of successful projects are presented that illustrate the range of solutions available. Based on these success stories, and the lessons learned from past failures, priority areas for investment and action are proposed. Major policy issues and constraints that need to be addressed to carry out this program are reviewed.

The examples of successful projects and the lessons they provide are presented as case studies in Part II of the report. Part III presents five-year investment profiles for 56 countries.

Price: US\$ 12.50, plus \$ 0.50 for postage. Prepayment required.

Orders to: (Orders no. 731). World Resources Institute, Publications, P.O. Box 620, Holmes, Pennsylvania 19043-0620, U.S.A.

The Global Possible. Resources, Development, and the New Century. R. Repetto, editor. A World Resources Institute Book. Yale University Press, New Haven and London, 1985, xv + 538 p. ISBN 0-300-03505-5 (paperback).

In May 1984, a Global Possible Conference was held in Wye, Maryland, U.S.A. to assess global-scale resource, population, and environmental problems and the policy shifts and initiatives needed to address them.

This book contains the papers presented, revised in view of the expert working sessions that took place at the Conference. Its chapters not only represent up-to-date analyses by some of the leading authorities in the fields of natural resources and population, they also impart an interdisciplinary view that reveals more than the sum of its parts. Perhaps more important, this book gives grounds for informed optimism about how the world's governments, businesses, and citizens can make headway against an array of difficult environmental challenges that, if unaddressed, threaten not only the quality of life but also prospects for sustainable development and the political stability of societies.

In the resource chapters that are the core of this volume and in the concluding agenda developed at the conference, the environmental scientists and others who prepared the analyses have taken an important step in proposing initiatives for public and private action, thus allaying the restive pessimism that stands between the world we have and the one we want. This bridge between science and informed policy, as well as that between theory and the real-world success stories recounted here, is what makes this volume especially useful.

Price: US\$ 13.95.

Orders to: (Order no. 723); see below.

World Enough and Time. R. Repetto. A World Resources Institute Book. Yale University Press, New Haven and London, 1986, xiv + 147 p. ISBN 0-300-03649-3 (Paperback).

How can we improve living standards and promote economic growth throughout the world while still maintaining our natural resources and environmental quality? This book describes how governments, businesses, and private citizens have been able to promote policies that lead to a more stable population and resource base and to more efficient energy use. The author argues that worldwide progress could be realized if we continue to implement those strategies that have already proven effective. He identifies basic mechanisms that are part of successful policy initiatives. He then provides specific ways to use resources wisely and shows through examples how relatively low cost policy changes can result in improved life expectancy and population stability, more livable cities, more plentiful food supplies without damage to soils and water, preservation of biological resources, sustainable use of forests and fisheries, and an abundance of energy with less environmental risk. Finally, the important implications these initiatives have for governments, international agencies, science, industry, and private voluntary agencies are explored.

This book is a companion volume to *The Global Possible: Resources, Development, and the New Century*. It is written for government leaders, environmental groups, and anyone concerned with the future of our planet's population and resources.

Price: US\$ 5.95, plus \$ 0.50 per title for postage. Prepayment required.

Orders to: (Order no. 732). World Resources Institute, Publications, P.O. Box 620, Holmes, Pennsylvania 19043-0620, U.S.A.

Forest Nutrition Management. D. Binkley. John Wiley & Sons, New York, Chichester, 1986, ix + 290 p. ISBN 0-471-81883-6 (hardbound).

Forest productivity is regulated by a suite of environmental factors, including radiation, temperature, water, and the availability of nutrients. The availability of nutrients is also affected by these environmental factors, and in most forests productivity is directly related to nutrient availability and uptake. Forest managers have little influence on climatic factors, so efforts to increase forest productivity have focussed on nutrient management. The availability of nutrients may be altered directly by treatments such as fertilization, or indirectly by a long list of forest practices. Intensive nutrient management offers profitable investment opportunities, and minimizes adverse effects of management on nutrient availability.

The field of forest nutrition management couples ecologic processes with management decisions and operations. The biogeochemical cycles of nutrient elements have many features in common, but the cycle of each nutrient also has unique features. The integration of nutrient cycling with forest management begins an understanding of the physiological role and basic cycling patterns of each nutrient, and progresses to assessment of site fertility.

In nature, a lack of soil nutrients prevents most forests from reaching maximum growth rates. Through fertilization and biological nitrogen fixation, foresters are able to manage nutrient levels and maximize growth potential. At the same time, the effects of good management are often diminished by the indirect removal of nutrients through tree harvesting and other operations.

The present book furnishes the sound understanding of forest nutrient cycles and the effects of management treatments that is necessary for maintaining and improving long-term forest productivity. After a description of the general features of nutrient cycles, the book supplies an explanation of the methods commonly used for assessing the nutritional status of forests. The intentional modification of the nutrient supply through use of fertilizers and biological nitrogen fixation is thoroughly covered in two chapters. Seedling nurseries and other special cases where large investments can be justified are discussed, and the economics of nutrition management are examined – with an emphasis on approaches to decision-making under conditions of uncertainty. In the final chapter, the use of models in forest nutrition management is shown.

With its integrated coverage of both science and management applications, this publication is valuable resources for the non-specialist in nutrient cycling and for students and teachers studying ecology, silviculture, and forest soils.

Price: £ 41.30.

Orders to: John Wiley & Sons, Baffins Lane, Chichester, West Sussex, England, PO19 1UD; or: John Wiley & Sons, 605 Third Avenue, New York, NY 10016, U.S.A.

Mineral Nitrogen in the Plant-Soil System. Physiological Ecology. A Series of Monographs, Texts, and Treatises. R. J. Hayes with contributions by K. C. Cameron, K. M. Goh and R. R. Sherlock. Academic Press, Orlando, London, 1986, xii + 483 p. ISBN 0-12-334910-9 (hardbound).

Commercial synthesis of nitrogenous fertilizers from atmospheric nitrogen has probably been the single most important factor resulting in dramatically increased crop yields over the past forty years. Indeed, nitrogen is required by plants in large quantities, and it is the most common key limiting factor to crop production when soil water supply is adequate. It is therefore not surprising that on an overall basis considerably more nitrogen than any other element is supplied to crops as fertilizers. Losses of fertilizer nitrogen from agricultural systems are, however, of considerable concern to both agriculturists and environmentalists since they not only represent an economic loss but may also result in pollution of ground or surface waters and the atmosphere. An understanding of the processes by which mineral nitrogen is formed and transformed in soils, absorbed and used by plants, and lost from the plant-soil system is therefore of particular importance from both agricultural and ecological viewpoints.

This comprehensive monograph is planned as an advanced text and reference for graduate students and researchers in the broad area of agriculture. The subject matter overlaps into a variety of disciplines and will be of interest to agronomists, soil scientists, plant physiologists, horticulturists, and foresters. This monograph fills a gap in the literature by providing an integrated account of the transformations and fate of mineral nitrogen in the plant-soil system. Throughout the text, emphasis is placed on a broad understanding of the processes being discussed and, in particular, on the major factors which influence each process.

The introductory chapter outlines the origin, distribution, and cycling of nitrogen in both natural and agricultural terrestrial ecosystems, and presents a broad perspective of the role and importance of mineral nitrogen in the plant-soil system. The processes of decomposition and mineralization-immobilization turnover are discussed in Chapter 2, while Chapter 3 outlines the processes of nitrification. Separate chapters follow on the adsorption of mineral nitrogen by soil components and leaching losses of nitrate, gaseous losses of nitrogen, plant uptake, translocation and use of nitrogen, and, finally, the use of nitrogen in agronomic practice.

Price: US\$ 62.50 or £ 52.00 in U.K.

Orders to: Academic Press, Orlando, FL 32887, U.S.A.; or: Academic Press, 24-28 Oval Road, London NW1 7DX, England.

Resource Management in Drylands. Stuttgarter Geographische Studien, Band 105. W. Meckelein and H. Mensching, editors. Geographisches Institut der Universität Stuttgart, 1985, 168 p. ISSN 0343-7906. This issue: ISBN 3-88028-105-X.

The Working Group on Resource Management in Drylands of the International Geographical Union (IGU) met in Stuttgart in August 1984. The main topics were: resource management in Northern Africa and the Sahara, sand dynamics and sand encroachment on cultivated drylands, water management in the Near East and India, and special problems in agricultural management. The papers presented on first issue dominate the present publication.

Price: DM 24.00.

Orders to: Otto Harrassowitz, P.O. Box 2929, D-6200 Wiesbaden, Fed. Rep. of Germany.

Sampling Problem for the Chemical Analysis of Sludge, Soils and Plants. A. Gomez, R. Leschber and P. L'Hermite, editors. Elsevier Applied Science Publishers, 1986, vi + 94 p. ISBN 1-85166-049-6 (hardbound).

Protection of the environment increasingly requires the development of a recycling society using 'secondary raw materials' instead of natural resources wherever possible. Among the methods of recycling the agricultural use of sludge is a traditional one and a good example with a long history of a meaningful use of waste material.

Increasing demands of water pollution control in the last decades leading to intensified and extended sewage treatment processes and thus to an increase of the sludge quantity have caused problems in this field in general. In addition, there were local problems of industrial pollution which have led to an increase of harmful substances in municipal sewage sludges. So, when the concerted Action cost 68 was set up by the Commission of the European Communities to study the beneficial and harmful effects of the agricultural use of sludge, investigation of harmful substances in the sludges and their environmental effects was one of the main tasks of work. Although the progress of analytical techniques enabled the environmental authorities and institutions to determine harmful substances in sludges with great accuracy, it became clear that unsatisfactory results and an incomplete reproducibility of analytical findings often were not due to shortcomings in the analytical procedure itself but to a preceding investigation step: Improper sampling and sample preparation. As a consequence, recommendations for the sampling of sludges and of polluted soils in different countries were set up and some of them became part of regulations and guidelines for the agricultural use of sludge.

Future requirements of analyzing sludges for micro and ultramicro concentrations of harmful substances will ask for further improvement and precision of sampling procedures.

The present publication contains the papers given at a Seminar, organized by the Commission of the European Communities in Bordeaux, France, November 1985. It provides information on sampling problems, in particular on improvements in the precision of sampling procedures. Their adoption will improve analytical results and the reproducibility and will ultimately lead to a more effective waste management.

Price: £ 18.00.

Orders to: See below.

Efficient Land Use of Sludge and Manure. A. Dam Kofoed, J. H. Williams, and P. L'Hermite, editors. Elsevier Applied Science Publishers, London and New York, 1986, x + 245 p. ISBN 1-85-166-006-2 (hardbound).

The papers in this publication were presented at a seminar held at the Ladelund School of Agriculture, near Askov in Denmark, June 1985, under the auspices of the Commission of the European Communities. The seminar was convened to review and assess recent knowledge on the efficiency of land use of sludge and manure.

Stricter environmental constraints are being placed on the practice of applying sludges and farm slurries to agricultural land. In order to minimise the risks to the environment there is a need to ensure that sludges and slurries are being used as efficiently as possible for the particular cropping situation, avoiding excessive applications. In order to achieve this, it is important to try to quantify the losses of nitrogen that can occur by leaching, volatilisation as ammonia into the atmosphere or by denitrification, and to investigate treatments and techniques to improve the efficiency of nitrogen use in organic manures.

A total of 24 papers was presented, the first three sessions being devoted to nitrification inhibitors, anaerobic digestion, application to growing crops, comparisons between surface spreading and soil injection, and the value of such practices in improving the efficiency of nitrogen utilisation by grass and arable crops. The last three sessions were concerned with nitrate leaching, ammonia volatilisation and how these losses might be reduced. Rapid field methods for determining the fertiliser value of farm slurries were described by two authors and, lastly, a paper was presented on the disease risks of sludge and slurry applications to land. All sessions are summarized and a list of conclusions is incorporated as well.

Price: £ 25.00.

Orders to: Elsevier Applied Science Publishers, Crown House, Linton Road, Barking, Essex, England IG11 8JU. In U.S.A. and Canada: Elsevier Science Publishers, 52 Vanderbilt Ave., New York, NY 10017, U.S.A.

Quelles Biotechnologies pour les Pays en Développement. A. Sasson. Biofutur/Unesco, 1986, 200 p. ISBN 92-3-202426-8.

Les biotechnologies peuvent contribuer à la solution de nombreux problèmes des pays en développement. Mais quelles biotechnologies choisir? S'il est vrai qu'elles n'exigent pas des investissements aussi importants que d'autres secteurs de la recherche et de l'industrie, les biotechnologies nécessitent, dans certains cas, des équipements complexes et des spécialistes hautement qualifiés. L'auteur présente dans cet ouvrage les possibilités offertes dans ce domaine aux pays en développement, ainsi que les difficultés et les contraintes auxquelles se heurtent, dans ces pays, le choix, le transfert et l'adaptation des biotechnologies.

Prix: FF 139.

Ordres à: Presses de l'Unesco, 7, place de Fontenoy, F-75700 Paris, France.

Physiological and Genetical Aspects of Mycorrhizae/Aspects Physiologiques et Génétiques des Mycorrhizes. Proceedings of the 1st European Symposium on Mycorrhizae, Dijon, July 1985. V. Gianninazzi-Pearson and S. Gianninazzi, editors. INRA, Versailles, 1986, 832 p.

This meeting was prompted by the considerable development in European research on mycorrhizae, a subject receiving growing interest because of the important repercussions that these symbiotic systems can have on plant production. The theme of the symposium underlines the necessity for further fundamental research into how mycorrhizae function, in order to be able to plan with confidence their use in agriculture, forestry, horticulture and ecology.

The first part of the book consists of two introductory and 16 review articles by mycorrhizalists and specialists from other fields relevant to mycorrhizal research; the second contains most (113) of the short papers presented at the workshops during the symposium followed by a round table report. The topics covered in the different chapters include: Infection development; Cellular interactions and exchange processes; Phosphate and nitrogen nutrition; Biomass efficiency; Non nutritional effects; Microbial and environmental interactions; Taxonomy and genetics; In vitro culture; Analytical methods for research; Heterotrophic Plants.

The study of mycorrhizae is relevant to many other areas of plant biology and this book will be valuable not only to researchers, teachers and students particularly concerned with mycorrhizae, but also to those involved in plant or fungal physiology, plant pathology, cell biology, soil microbiology and microbial biotechnology.

The text is partly in French, partly in English.

Price: FF 340.00, prepayment required.

Orders to: INRA, Service de Publications, CNRA, route de Saint-Cyr, F-78000 Versailles, France.

Water Management in Relation to Nature, Forestry and Landscape Management. Proceedings and Information No. 34. J. C. Hooghart, ed. TNO Committee on Hydrological Research, TNO, The Hague, 1986, 140 p. ISBN 90-6743-095-1.

These proceedings of Committee on Hydrological Research Technical Meeting 43 in February 1986 contain seven articles on the relation between water management and nature conservation, forestry and landscape.

In hydrological studies in the Netherlands nature conservation has been treated mainly as a boundary condition for the protection of the areas involved. Forestry got some attention in studies on rainfall/runoff relationships and on evapotranspiration. Until recently little was known about the influence of different water management strategies on nature and forestry. Hydrologists generally did not pay much attention to these problems.

One of the reasons why the knowledge on the relation between water management, nature and forestry is lagging behind, lies undoubtedly in the different research traditions in the various disciplines involved. In addition to this difference, interdisciplinary co-operation often failed in the past. An important step was taken in 1982 with the creation of the Study Committee Water Management Nature-, Forest- and Landscape Management (SWNBL) which is now supported by the most relevant ministries, provincial boards and the Union of Waterboards. SWNBL was founded with the purpose to create a synthesis of knowledge in the field of ecology, forestry, landscape and hydrology in such a way that it could be used to predict the effects of changing hydrological conditions on natural vegetation, forestry and landscape. The SWNBL-study, that has to be completed in 1987, is limited in the scope to terrestrial flora and vegetation of the higher plants but includes timber production and landscape physiognomy. A review of the first results of the SWNBL-study is given in the Annex of the present publication.

The programme of Technical Meeting 43 is for a good deal based on provisional results of the SWNBL-project. The contributions in this volume were prepared by authors from different disciplines, including agricultural sciences, biology, physical geography and civil engineering. They may demonstrate how the co-operation between the various disciplines in the field of water management - nature conservation - forestry has improved in the recent years.

Price: US\$ 15.00, including postage.

Orders to: CHO-TNO, P.O. Box 297, 2501 BD The Hague, The Netherlands.

International Savanna Symposium 1984. J. C. Tohill and J. J. Mott, editors. CAB International, Farnham Royal, 1986, 384 p. ISBN 0-85 198-535-1.

The controversy and confusion surrounding the term savanna has until now deprived us, particularly in Australia, from identifying ourselves clearly with other systems of similar structure and function elsewhere, or even of recognizing the significance of this important biome. This International Savanna Symposium, held for the first time in Australia in May 1984, has directed attention at the similarities and differences in the ecology, use and management of the world's savannas. In these proceedings the contributions have addressed a logical development of the subject from definition, structural and functional aspects of savanna ecosystems, land use and productive potential to case studies of the effects of land use, the problems and solutions.

This book is mainly for the technical and academic readers in biology, agriculture and land management but readers in natural history, anthropology and sociology will also find it useful.

Price: In U.K. £ 25.00; American US\$ 47.50; elsewhere £ 27.50; postage included.

Orders to: CAB International, Farnham House, Farnham Royal, Slough SL2 3BN, England.

Institute of Soils and Water, Bet Dagan, Israel. An Indexed Bibliography - Sixty Years of Research 1926-1986. Special Publication No. 236. C. Rapaport. Dept. of Scientific Publications, The Volcani Center, Bet Dagan, 1986, 239 p.

This bibliography includes a complete list of about 1600 publications of the Institute of Soil and Water, Volcani Center, Bet Dagan, Israel, which appeared between 1926 and 1986. It covers such fields as soil science, irrigation, fertilizers and pesticides applications, agricultural meteorology, and plant physiology. It also contains a complete subject index, an annual and an author index.

Price: US\$ 9.25.

Orders to: Dept. of Scientific Publications, Agricultural Research Organization, The Volcani Center, P.O. Box 6, Bet Dagan, 50250 Israel.

European Directory of Agrochemical Products. Second edition. Royal Society of Chemistry, Nottingham, 1986, approx. 2400 pp. ISBN 0-85186-653-0, 4 volume set.

This directory lists comprehensive data and information for over 20,000 agrochemical formulated products manufactured, marketed, and/or used in Europe. The information has been gathered from a wide variety of sources within the 20 countries concerned, together with information provided directly by the manufacturers. It has four volumes: 1 Fungicides, 2 Herbicides, 3 Insecticides and acaricides, and 4 Plant growth regulators.

In each volume, information is arranged into sections detailing products with the same constituent active ingredients, alphabetically ordered, and further subsectioned by country. This allows comparison of the products used, and the permitted uses, in different countries. The information on uses is presented in considerable detail. Within any one country, all products which have identical uses are now listed together, so that you can see at a glance which products are used for controlling the same pests, diseases or weeds in the same range of crops.

Price: 4 volume set: In U.K. £ 235.00, in U.S.A. \$ 456.00, elsewhere £ 259.00. Individual price per volume £ 80.00, \$ 155.00 and £ 88.00 respectively.

Orders to: The Royal Society of Chemistry, Distribution Centre, Blackhorse Road, Letchworth, Herts. SG6 1HN, England.

Engineering Models for Agricultural Production. D. R. Hunt. AVI Publishing Co., Westport, 260 p. ISBN 0-87055-494-8 (hardbound).

In agricultural engineering physical science and technology are applied to problems in the agricultural production system. Systems are identified in various ways, but most people agree that a system includes many components interacting to achieve a common goal. Subsystems can be identified with the larger system if individual, limited goals which contribute to the overall system goal are achieved. The agricultural engineer working in agricultural production is aided by mathematical models of these complex systems.

Since before recorded history, workers have enhanced the effectiveness of the natural system. With the relatively recent advent of engineering science, mankind has been able to insert more energy and many new processes and machines into the system. Now, the major activity in agriculture is the operation of the equipment subsystem. The role of the agricultural engineer is to design and develop equipment and procedures which enhance the effectiveness and the economy of the whole system.

This presentation was conceived to introduce elementary systems modeling concepts to students of agricultural engineering. It applies concepts of economics, probability, and optimization to mathematical models of the production operations in agriculture. The examples used and the problems posed are selected from on-farm activities as the farm production system is the common one served by all agricultural engineers regardless of specialty.

Price: US\$ 39.50.

Orders to: AVI Publishing Co., P.O. Box 831, Westport, CT 06881, U.S.A.

The Fourth Major Nutrient. The Sulphur Institute, Washington, 1982, 32 p.

Crops need at least sixteen nutrients for normal growth. Three of these nutrients, nitrogen, phosphorus, and potassium, have traditionally been known as the major nutrients. Crops need large amounts of these elements and fertilizer programs are designed to supply them in adequate amounts.

Another nutrient, sulphur, is also needed in large amounts by crops. Many crops contain as much sulphur as phosphorus, and it ranks in importance with nitrogen and phosphorus in the formation of protein. It is an integral component of certain vitamins and enzymes.

In the past, commonly used fertilizers contained large amounts of sulphur and from this source, and also from rainfall and other sources, was supplied 'incidentally', and masked the real importance of this essential plant nutrient.

Increasing use of more concentrated fertilizer materials which contain little or no sulphur, combined with less sulphur from rainfall in many areas, have decreased the supply of sulphur to the crops. At the same time, higher crop yields have increased the uptake of sulphur from the soil. Soils which originally contained sufficient sulphur often become deficient as agriculture is intensified, unless sulphur-containing fertilizers are used. In recent years, sulphur deficiencies have been reported with increasing frequency from many parts of the world. This attractive publication is also available in Spanish.

Price: US\$ 2.00, or £ 2.00.

Orders to: see below.

The Fourth Major Nutrient – Slide set with commentary. The Sulphur Institute, Washington, 1986.

This set of 48 slides shows the role and importance of sulphur as a plant nutrient. It shows the effects of insufficient sulphur on crops, the responses that are being obtained by adding this nutrient, and discusses briefly the types of sulphur-containing fertilizers.

The set is intended for use by agricultural advisers and fertilizer dealers. It has been deliberately designed to permit addition or substitutions of alternative slides of sulphur responses or sulphur fertilizer materials, with only minor changes in the suggested commentary.

The points covered in the slide set are discussed in greater detail in the above mentioned booklet. The booklet is a useful handout as a reminder and follow-up of the presentation.

Price: US\$ 15.00 or £ 15.00, including postage.

Orders to: The Sulphur Institute, 1725 K Street, N.W., Washington, DC 20006, U.S.A.; or: The Sulphur Institute, 3/9 Heddon Street, London W1R 7LE, England.

Consolidation of Soils: Testing and Evaluation. ASTM STP 892. R. N. Yong and F. C. Townsend, editors. American Society for Testing and Materials, Philadelphia, 1986, 750 p. ISBN 0-8031-0446-4 (hardbound).

Since the last full documentation of consolidation performance of soils in the laboratory and field occurred over 20 years ago, considerable progress in developing a better appreciation of soil performance has led to the design of new and innovative techniques in assessing soil properties and characteristics pertinent to compression/consolidation behavior.

In addition to the well-documented historic concerns dealing with the less-than-accurate correlations between predicted and measured consolidation behavior of field soils, recent encounters with significant problem situations have highlighted the need for a comprehensive documentation of consolidation testing and evaluation. The advent of computers for solving previously restricted numerical analytical schemes, and transducers coupled with data acquisition systems to provide continuous monitoring, have become commonplace. Problem soils, such as soft clays, gaseous soils, organic soils, and slimes, require not only specialized test equipment and techniques but also the development of theories and field validation tools.

In recognition of the above, the ASTM Symposium on the Consolidation Behavior of Soils was held in Ft. Lauderdale, Florida, January 1985. The objectives of the ASTM symposium (and of this volume) were as follows: (1) to review the state of the art of consolidation testing, with particular emphasis on developments made in the last two decades, (2) to establish and assess requirements for consolidation testing of problem soils not previously considered in detail via actual studies with new techniques and procedures, (3) to compare and evaluate the various new methods and test equipment used for determination of consolidation behavior, (4) to study the viability of the various data reduction models and methods of application of data and measurements for assessment consolidation behavior, (5) to identify the shortfalls and areas of needed study for development of consolidation testing and evaluation, and (6) to provide a focal point for the development and improvement of ASTM consolidation testing standards.

There have been many advances made in (1) equipment and instrumentation capabilities, (2) test methodologies and data gathering and control systems, and (3) methods for data handling and analysis. All of these combine to provide a better capability of securing a more reliable analysis of the problem of consolidation determination.

Two state-of-the-art papers open this volume, followed by four general reports that summarize the 31 technical papers which follow. The volume closes with two retrospective evaluations.

Price: £ 79.00.

Orders to: In Europe: American Technical Publishers Ltd., 68a Wilbury Way, Hitchin, Herts. SG4 0TP, England. Elsewhere: ASTM, 1916 Race Street, Philadelphia, PA 19103, U.S.A.

Land Development and Management of Acid Tropical Soils in Africa. Report of the IBSRAM Sessions Seminar on Lateritic Soils, Materials and Ores, Douala, Cameroon, January 1986, 31 p. IBSRAM Inc., No. 1 SSSN 0857-3247.

Many national project proposals prepared by program participants were presented to the International Board for Soil Research and Management (IBSRAM) after the two inaugural workshops – one on Management of Acid Tropical Soils and the other on Tropical Land Clearing for sustainable Agriculture.

These proposals represent the first success of the exercise in establishing a network. However, a network should be considered as an innovative, iterative process of communication between the cooperators, IBSRAM, the Network Coordinating Committees of the two IBSRAM networks, and the donors. A careful discussion of projects will undoubtedly improve their quality and ensure the homogeneity of the network.

It was agreed that seminars should convene potential cooperators and the NCC, on a regional basis in order to revise, harmonize and establish the basis for the implementation of projects.

One of the intentions of the first regional seminar on lateritic soils, materials and ores, was to solve *this harmonization problem and to help cooperators in the first steps of the implementation of their projects*, notably with regard to: site selection; site characterization; and the design of the experiment in accordance with the site characteristics.

Site selection is the first key for the transfer of experimental results to farmers. It must include a socio-economic and physical survey in order to be sure of being useful and representative of the chosen site. When an existing experimental station has been selected, the extent to which it fulfills the criteria for usefulness and representativeness must be checked with reference to the surrounding areas. Site characterization is the second key for any transfer of results, and the basis for the interpretation of these results. Site characterization for soil management cannot involve only a taxonomic characterization. It must take into account edaphic parameters, vertical and lateral variability, the dynamics of water and ions, and the distribution of biological activity. Finally, the design of experiments must take into account the site characterization and the variability of the soil mantle. Statistical designs must adapt to the site reality, and may in some places of high variability not be the only tool for ascertaining experimental results. It is essential to produce some harmonization of these different approaches when looking at the formation of a network.

The general goal of the IBSRAM sessions was to organize an African program for the networks on 'Management of Acid Tropical Soils' and on 'Tropical Land Clearing for Sustainable Agriculture' and to see how to implement it. The present report sets out the proposal for the programme on land clearing and management of these soils in 9 countries.

Requests to: IBSRAM, P.O. Box 9-109, Bangkok, Bangkok 10900, Thailand.

Hydrological Aspects of Drought. Studies and reports in hydrology 39. Prepared by a joint Unesco/WMO panel. M. A. Beran and J. A. Rodier, rapporteurs. Unesco, 1985, vii + 149 p. ISBN 92-3-102288-1.

Although the total amount of water on earth is generally assumed to have remained virtually constant, the rapid growth of population, together with the extension of irrigated agriculture and industrial development, are stressing the quantity and quality aspects of the natural system. Because of the increasing problems, man has begun to realize that he can no longer follow a 'use and discard' philosophy – either with water resources or any other natural resources. As a result, the need for a consistent policy of rational management of water resources has become evident.

Rational water management, however, should be founded upon a thorough understanding of water availability and movement. A series of studies on droughts were undertaken during the International Hydrological Decade launched by Unesco in 1964.

From 1968 to 1973, during the severe drought which affected the Sahel and other tropical regions, the interested governments and international organizations did their best to ameliorate the direct consequences of this catastrophe, to study the conditions and causes of the drought, and to recommend measures which could, in the future, mitigate the effects of such droughts.

The present study is a state-of-the-art report on hydrological aspects of drought. It includes chapter on characteristics of drought, factors responsible for droughts, methodologies for the study of droughts and exceptional low river flows, droughts in tropical and temperate areas, and prospects for the limitation of their consequences.

Price: FF 75.00.

Orders to: Unesco National Distributors around the world; or, in case of difficulties, The Unesco Press, 7, place de Fontenoy, F-75700 Paris, France.

The Fertilizer Industry – The Key to World Food Supplies. International Fertilizer Industry Association, Paris, 1986, 100 p.

This attractive publication is a basic introduction to fertilizers and the fertilizer industry. It is not for the experts, but for those who want to acquire an elementary knowledge of the nature of fertilizers, their effect on agricultural production, the problems of promoting their use, the economics of the industry, its changing structure, its raw material base, its future prospects.

Price: US\$ 12.00, £ 8.00, or FF 80.00.

Orders to: IFIA, 28 rue Marbeuf, F-75008 Paris, France.

World Resources 1986. An Assessment of the Resource Base that Supports the Global Economy. A Report by the World Resources Institute and the International Institute for Environment and Development. Basic Books Inc., New York, 1986, xii + 353 p. ISBN 0-465-09234-9 (hardback); 0-465-09235-7 (paperback).

The very interesting compilation on the world's natural resources contains more than 100 statistical reviews and assessments of global and regional resources. In concise accounts of the latest information on population, agriculture, forests, wildlife, energy water, and the atmosphere of 146 countries this annually updated report gives information on some of the most pressing issues of our time.

Besides the comprehensive data tables as well as many special tables highlighting particular resources and trends, separate chapters provide accounts of the developments in population, human settlements, food and agriculture, forests and rangelands, wildlife and habitat, energy, freshwater, oceans and coasts, atmosphere and climate, and policy and institutions. This wealth of information is of importance to many, and the series will be an easy accessible reference.

Price: US\$ 16.95 (paperback).

Orders to: World Resources Institute, Publications, P.O. Box 620, Holmes, PA 19043-0620, U.S.A.

Desertification in the Sahelian and Sudanian Zones of West Africa. J. Gorse. The World Bank, Washington, 1985, 60 p. (also available in French: *La désertification dans les zones sahélienne et soudanienne de l'Afrique de l'Ouest*, J. Gorse. Banque Mondiale, Washington, 1985, 71 p.).

This study was undertaken in response to growing concern, both inside and outside the Bank, that not enough was being done to tackle the desertification problem in West Africa. Desertification is a process of sustained decline of the biological productivity of arid and semi-arid land; the end-result is desert, or skeletal soil that is irrecoverable. This process is now at work in many parts of the West African Sahelian and Sudanian Zones (SSZ). Whether desertification is caused mainly by droughts and increasing aridity, or by resource abuse by the resident population, is hotly debated.

Behavior in the SSZ is conditioned by two fundamental environmental features: rainfall is variable, and decreases in amount and predictability from south to north across the SSZ; and soils are of low fertility, particularly in phosphates and nitrogen, and structurally fragile. The traditional production systems described in Chapter II developed as responses to these conditions and included techniques, as well as enforceable rules, for assuring sustained-yield use of the modest and fragile resource base.

As measured by the comparison between actual populations and carrying capacities (with traditional production techniques), it is in the Sahelo-Sudanian zone (350–600 mm per year) that resources are being most seriously over-exploited. Desertification has set in, and crop yields are falling in many areas. Desertification is most threatening in the central Sahelo-Sudanian zone and the adjacent Sudanian and Sahelian zones, or the SSZ heartland.

Past development efforts (Chapter III) have largely focussed on promoting productivity improvements in a single sector – crops of livestock or forestry – without paying much attention to the contexts in which traditional production systems developed.

In order to address the desertification problem, certain elements of a strategy are treated in Chapter IV. The implications for action of the foregoing elements of a strategy are listed in Chapter V.

It is concluded that within the SSZ heartland, no significant change in carrying capacities is possible without a technological breakthrough.

Price: US\$ 5.00.

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

Current Progress in Soil Research in People's Republic of China. Soil Science Society of China, editor. Jiangsu Science and Technology Publishing House, Nanjing, 1986, 698 p.

This important publication on soil research activities during the last decade in the People's Republic of China contains 81 papers on soil physics (5 papers); soil chemistry (10 papers); soil biology and biological chemistry (11 papers); soil fertility and plant production (25 papers); soil genesis, classification and cartography (20 papers); soil technology (7 papers); and soil mineralogy (3 papers). Special attention is being given to investigations on paddy soils, red soils in the tropical and subtropical regions, and to salt-affected soils.

Price: US\$ 60.00, including registered airmail postage; advance payment required.

Orders to: Soil Science Society of China, 71, East Beijing Road, Nanjing, People's Republic of China.

Land Resources of the Loess Plateau of China. Zhu Xianmo, Chief Editor. Shaanxi Science and Technique Press, Yangling, 1986.

This impressive photobook contains hundreds of large-size colour photographs of the Loess Plateau, the cradle of Chinese culture and agriculture, where more than 2600 years ago a simple division of different loess soils was already developed.

After several introductions, photographs show the physiography of the region, the different forms of large-scale erosion, the different land types, and conservation measures. This book is a valuable addition for persons interested in geology, geography and pedology, and for soil conservationists.

Price: US\$ 100.00, including mailing charges; pre-payment required.

Orders to: Prof. Zhu Xianmo, Institute of Soil and Water Conservation, Academia Sinica, Yangling, Shaanxi, People's Rep. of China.

Multiple Cropping Systems. C. A. Francis, editor. Macmillan Publ. Comp., New York and Collier Macmillan Publ., London, 1986, xiv + 383 p. ISBN 0-02-948610-6, hardbound.

No other human challenge is more critical than that of providing food for an ever-growing human population. And at no time in history has this challenge been more obvious than it is today. Each year some 80 million more people are added to the nearly 5 billion who must be fed. In spite of the unprecedented increases in world food production of the past two decades which scientists have helped stimulate, per capita food production has increased insignificantly. Equally unprecedented growth in human populations has essentially nullified the food production increases. In fact, some areas such as those in Africa, south of the Sahara, have actually lost ground. Per capita food production there has declined during the past 15 years.

Traditionally, increased food production has come from putting more land under cultivation. But in larger areas of the world, and especially in Asia, essentially all the land that can be economically cultivated is already in use. In the future, most of the extra food the world needs must come from higher production from land already being farmed. A major share of this increase will likely come from improved crop cultivars, which will provide higher yields per unit area. But vast areas in the tropics and subtropics also offer a second means of increased food production – increasing the number of crops produced per year on a given field. Such multiple cropping offers potential not only to increase food production but to reduce soil erosion by keeping vegetation on the land a higher proportion of the year.

Multiple cropping in its many forms provides a substantial proportion of the world's food. Disappearing in some areas due to mechanization of planting and harvest, but increasing in other areas where land is precious and intensive cultivation is the rule, this group of complex cropping systems is just beginning to excite the interest of the scientific community. Farmers, on the other hand, have depended on these systems for centuries. The contributions of multiple cropping systems today are obvious, yet their importance in the future is open to speculation. This book explores both today's systems and the potentials of complex, intensive cropping systems for the future.

This interesting study brings together many of the research results that are not easily available to the reader who is distant from such sources as annual reports and unpublished data from national programs and international centers. More than a comprehensive, state-of-the-art compilation of historical data, the book critically reviews the existing literature and other information on multiple cropping. Authors of the several chapters were selected because of their professional experience in this field, and the perspective they bring to an evaluation of their own and other work in each discipline. The book works through these topics and presents an assessment of future directions for research and development in each area.

This first critical review of multiple cropping from a worldwide perspective should be of value to scientists and students interested in (applied) research to extension specialists, and other who wish to familiarize themselves with multiple cropping systems.

Price: US\$ 37.50.

Orders to: Macmillan Publishing Company, 866 Third Avenue, New York, NY 10022, U.S.A.; or: Houndmills, Basingstoke, Hants. RG21 2XS, England.

Modelling of Agricultural Production: weather, soils and crops. Simulation Monographs. H. van Keulen and J. Wolf, editors. Pudoc, Wageningen, 1986, x + 479 p. ISBN 90-220-0858-4.

This book introduces the reader into the quantitative aspects of agriculture production, as influenced by environmental conditions and management practices. The aim is to familiarize the reader with the subjects in such a way that first estimates of agricultural production potentials in situations relevant to him can be made. For that purpose many exercises and examples have been included in the text to facilitate direct application of the theory presented.

In this textbook four hierarchically ordered production situations are treated quantitatively. Exercises are provided, and answers are given. The book can be used for courses in developing countries.

The approach presented in this book is developed by the Centre for World Food Studies (SOW), an interdisciplinary research group working on problems related to world food supply and agricultural production potentials and limitations.

This book is to a large extent based on the results of elaborate simulation models that have been developed in the past decade. Many of them have been described in other volumes of the Simulation Monograph series. For the present purpose these models have been simplified to such an extent that all calculations can be done with a simple scientific pocket calculator. For extended use this may be too cumbersome and for that reason a FORTRAN program is presented, which allows the user to do the calculations on most home computers.

Any model, and certainly the computational schemes presented in this book are simplified representations of the complex real world. Therefore the results obtained should always be critically examined in the light of the practical experience and the results of field experiments, the more so if the crop is grown at the extremes of the range of conditions under which it is normally grown.

The book is written for teachers, students and research scientists in agrometeorology, soil science and agronomy.

Price: Dfl. 110.00 or US\$ 44.00 outside U.S.A. and Canada.

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

Plant Growth, Drought and Salinity. N. C. Turner and J. B. Passioura, editors. CSIRO Australia, 1986, 201 p. ISBN 0-643-04017-X. Reprinted from Australian Journal of Plant Physiology, Vol. 13, No. 1, 1986.

This book brings together the invited papers presented at a conference on 'Plant Growth, Drought and Salinity' held in Canberra, 1985. The conference aimed to focus attention on the influence of drought and salinity on plant growth and production. Since plant growth depends largely on the amount of light captured by the leaves, the influence of drought and salinity on leaf growth was emphasized. Growing cells may be affected by drought and/or salinity in several ways: they may be starved of assimilates; they may be inadequately turgid; they may suffer metabolic disruption through, say, an excessive concentration of ions on their cytoplasm; they may be under the control of other parts of the plant by means of growth regulators. Contributors were asked to discuss their research within this framework, keeping in mind the primary focus on plant growth. Additionally, sessions were incorporated in which the agronomic and ecological importance of drought and salinity stress on a national and international scale were evaluated and the importance of the physiological mechanisms on plant production, yield and survival were considered.

Price: Austr. \$ 20.00.

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

Forage and fuel Production from Salt Affected Wasteland. Proceedings of a Seminar, Cunderdin, Western Australia, 19-27 May 1984. E. G. Barrett-Lennard, C. V. Malcolm, W. R. Stern and S. M. Wilkins, editors. Elsevier Science Publishers, Amsterdam, Oxford, New York and Tokyo, 1986, x + 459 p. ISBN 0-444-42651-5, hardbound. Reprinted from Reclamation and Revegetation Research, vol. 5, no 1 to 3.

In May 1984, scientists from 20 countries participated in a seminar on the production of forage and fuel from salt affected wasteland. It dealt specifically with growing highly salt tolerant plants under natural rainfall on salt affected soils.

These proceedings of the seminar will provide an information base for new initiatives in this little-researched area. The reports on 18 countries are a feature of the proceedings and they graphically illustrate the extent and nature of the salinity problem and the dearth of knowledge concerning potential productivity of salt affected land. In other papers, the causes of salinity are discussed; it is shown that plants and techniques are available to permit production of useful forage and fuel. It is clear that salt affected land need not be regarded as wasteland; the challenge to make better use of this resource now needs to be grasped.

Price: Dfl. 200.00 or US\$ 74.00.

Orders to: Elsevier Science Publ., P.O. Box 211, 1000 AE Amsterdam, The Netherlands. In U.S.A. and Canada: Elsevier Science Publ. Comp., P.O. Box 1663, Grand Central Station, New York, NY 10163, U.S.A.

A Practical Introduction to Optical Mineralogy. C. D. Gribble and A. J. Hall. George Allen & Unwin, London, Boston and Sydney, 1985, xiv + 249 p. ISBN 0-04-549008-2 (paperback); 0-04-549007-4 (hardback).

Microscopy is a servant of all the sciences, and the microscopic examination of minerals is an important technique which should be mastered by many earth scientists early in their careers. Advanced modern textbooks on both optics and mineralogy are available, and the intention is not that this new textbook should replace these but that it should serve as an introductory text or a first stepping-stone to the study of optical mineralogy. The present text has been written with full awareness that it will probably be used as a laboratory handbook, serving as a quick reference to the properties of minerals, but nevertheless care has been taken to present a systematic explanation of the use of the microscope as well as theoretical aspects of optical mineralogy. The book is therefore suitable for the novice either studying as an individual or participating in classwork.

Both transmitted-light microscopy and reflected-light microscopy are dealt with, the former involving examination of transparent minerals in thin section and the latter involving examination of opaque minerals in polished section. Reflected-light microscopy is increasing in importance in undergraduate course on ore mineralisation, but the main reason for combining the two aspects of microscopy is that it is no longer acceptable to neglect opaque minerals in the systematic petrographic study of rocks. Dual purpose microscopes incorporating transmitted- and reflected-light models are readily available, and these are ideal for the study of polished thin sections. The technique of preparing polished thin sections has been perfected for use in the electron microprobe analyser, which permits analysis of points of the order of one micron diameter on the polished surface of the section. Reflected-light study of polished thin sections is a prerequisite of electron microprobe analysis, so an ability to characterise minerals in reflected light is of obvious advantage. Reflected-light microscopy is described with consideration of the possibility that experienced transmitted-light microscopists may wish to use this book as an introduction to the reflected-light technique.

The book is intended to aid the identification of minerals under the microscope, but not the description or interpretation of mineral relationships. As such, it will be useful to the undergraduate student beginning a course in optical mineralogy and perhaps to the microscopist experienced in transmitted-light who needs an introduction to reflected-light technique.

Price: £ 8.95 paperback; £ 18.00 hardback.

Orders to: George Allen & Unwin, P.O. Box 18, Hemel Hempstead, Herts. HP2 4TE, England; Allen & Unwin Inc., 9 Winchester Terrace, Winchester, MA 01890, U.S.A.; or: George Allen & Unwin, P.O. Box 764, North Sydney, NSW 2060, Australia.

Agroclimatological Data for Latin America and the Caribbean, Données Agroclimatologiques pour l'Amérique Latine et les Caraïbes; Datos Agroclimatológicos para América Latina y el Caribe. FAO, Rome, 1985. ISBN 92-5-002294-8.

Over the past ten years a considerable amount of Agroclimatological information has been collected by FAO. This information, which now covers well over 3200 stations, has served as base for many recent FAO documents, in particular the Agroclimatology surveys, the report on the agro-ecological zones and the activities derived from these projects. This data base is also used in the framework of agrometeorological crop monitoring and forecasting activities at Headquarters and by member countries. Last but not least, an increasing demand for Agrometeorological information by many specialists and institutions has made the publication of this information necessary.

The analysis of the information, based on original methods developed by FAO, has been systematically applied to those stations where all the parameters required to calculate potential evapotranspiration were available. This analysis has also permitted the definition of the average starting and finishing dates of the growing season, imposed by the distribution of average rainfall. The application of information on the climatic risk based on crop-water balance provides information for agricultural planning.

This interesting compilation presents data for 800 stations, and follows the two volumes related to Africa. It will be followed by other volumes providing similar information for the countries of Asia.

Orders to: authorized FAO Sales Agents, or, in case of difficulties, Distribution and Sales Section, FAO, Via delle Terme di Caracalla, 00100 Rome, Italy.

Soil at Risk, Canada's Eroding Future; Nos Sols Dégradés, Le Canada Compromet son Avenir. A Report on Soil Conservation by the Standing Committee on Agriculture, Fisheries, and Forestry, to the Senate of Canada, Ottawa, 129 p. French part 143 p.

Canada is facing the most serious agricultural crisis in its history and unless action is taken quickly, this country will lose a major portion of its agricultural capability.

The Standing Senate Committee on Agriculture, Fisheries and Forestry has travelled extensively in Canada examining the issue of 'soil degradation', a problem which is already costing Canadian farmers more than 1000 million per year in farm income. It has determined that Canada is clearly in danger of squandering the very soil resource on which its agricultural industry depends.

Based on the evidence presented to it, the Committee has made a number of recommendations designed to raise public awareness of the problem and to improve the dialogue between the public, farmers, governments and environmental experts.

Put simply, soil degradation is the depletion of the productive capability of Canada's precious soils and it is a costly problem. The following was found: it is estimated that erosion of one inch of soil can reduce wheat yields by 100 to 230 kg per ha; in southwestern Ontario, the erosion problem has caused a loss in corn yields of some 30 to 40 percent; On lands affected by salinization in the Prairies, crop yields have been reduced by 10 to 75 percent, even though farmers have increased their use of fertilizer; It is estimated, at 1982 prices, that it would cost Prairie farmers \$ 239 million in fertilizer to fully recover the present loss of grain production from wind and water erosion; More difficult to put a dollar figure on, but equally as serious, is the permanent loss of rich agricultural land to urban use. Between 1961 and 1976, Canada lost more than 1.4 million ha of farmland. These figures do not reflect the cost of soil degradation to forest or recreational lands, or on wetlands.

The publication not only treats the origins of the soil degradation, but also issues on soil conservation and the role of the Canadian government. The facts and figures are presented to call Canadians to action – to show that soil degradation has become a national problem requiring national attention.

Requests to: Ms. Diane Deschamps, Committee Clerk, Standing Senate Committee on Agriculture and Forestry, The Senate of Canada, Ottawa K1A 0A4, Canada.

Soil Science in India. Bulletin 14. Indian Society of Soil Science, New Delhi, 1984, 175 p.

The present publication which is being released on the occasion of the Golden Jubilee of the Indian Society of Soil Science traces the growth and development of various aspects of soil science in India.

The different chapters comprise a brief account of soil work in India from ancient time to present day, the various organizations engaged in the study of soils, important contributions of soil science to agricultural production, the current status of soil research and projections for future lines of investigations.

During its Golden Jubilee, it is but natural to trace the history of foundation of the Indian Society of Soil Science and how the Society has come to its present eminent position and has played a key role in dissemination of the knowledge of soil science in the country.

Requests to: Indian Society of Soil Science, Division of Soil Science and Agricultural Chemistry, Indian Agricultural Research Institute, New Delhi-110 012, India.

Advances in Soil Science. Soviet Pedologists to the 13th International Congress of Soil Science. U.S.S.R. Academy of Sciences. V. A. Kovda and M. A. Glasovskaya, editors-in-chief. Nauka, Moscow, 1986, 288 p.

This publication contains all papers presented to the 13th International Congress of Soil Science in Hamburg, August 1986 by soil scientists of the U.S.S.R. Much attention is paid to changes in soil caused by man, e.g. mechanical treatment and fertilizing. All texts are in English.

Requests to: All-Union Society of Soil Science, Pyzhevsky per 7, 109017 Moscow, U.S.S.R.

Karte der Bundesrepublik Deutschland 1:1.000.000. Bodenkarte, Legende und Erläuterungen. Map of the Federal Republic of Germany 1:1.000.000. Soil Map, Legend, and Explanatory Notes. G. Roeschmann. Bundesanstalt für Geowissenschaften und Rohstoffe, Hannover, 1986, 76 S., 1 Karte.

This new soil map of the Federal Republic of Germany is based upon the existing map of 1963 at the same scale and the 1978 map at 1:2 million, with the addition of certain environmentally important soil properties to the legend. The 57 soil map units are arranged into seven groups with respect to geomorphology, geology and the general character of the soil landscape.

The soil nomenclature used follows the German Soil Science Society's classification (Mückenhausen, 1977 en 1985), which uses soil types and subtypes. A correlation with the soil units of the FAO-Unesco Soil Map of the World and Soil Taxonomy is also given. The legend contains brief information on ten soil properties which are of importance for their use possibilities, e.g. mean agricultural productivity, available nutrient reserve, soil water characteristics, susceptibility to compaction, erosion by water and wind. Both the explanatory text and the map legend are in German and English.

Orders to: Bundesanstalt für Geowissenschaften und Rohstoffe, Postfach 510153, D-3000 Hannover, Fed. Rep. of Germany.

Soil in Relation to the Phytomass Production and Landscape Formation. Transactions of the 6th Czechoslovak Soil Science Conference, Nitra, September 1985. Vol. 1. Z. Bedrna, M. Dzatko and J. Jurani, editors. 1985, 284 p.

This book contains the proceedings of the above mentioned Conference. The 44 papers are either presented in English or have English abstracts.

Requests to: Czechoslovak Society of Soil Science, Roznavska 23, 82369 Bratislava, Czechoslovakia.

Bioproduction of Grasslands. Contribution to MAB Project III. Valgas, Tallinn, 1986, 158 p. Publ. no. 633.2.03:581.14.

This publication contains 19 papers on different research aspects of grassland in the Estonian SSR, USSR, carried out in the framework of Unesco's Man-and-the Biosphere (MAB) programme; project III: Ecological impact of human activities and land use practices on grasslands. Papers are either in English or have English Summaries.

Requests to: Academy of Sciences of the Estonian SSR, Tallinn, Estonian SSR, U.S.S.R.

Microbial Communities in Soil. FEMS Symposium 33. V. Jensen, A. Kjøller and L. H. Sørensen, editors, Elsevier Applied Science Publishers, London and New York, 1986, xiii + 447 p. ISBN 0-85334-441-8; hardback.

The present volume contains the invited and some of the contributed papers presented at the symposium 'Microbial Communities in Soil', held in Copenhagen in August 1985, under the auspices of the Federation of European Microbiological Societies (FEMS). The papers contained in this book focus on the diversity of soil microbes in relation to important factors in the soil environment. After an introductory paper, the volume has the following sections: microorganisms on plant roots and their influence on the growth of higher plants (8 papers); the role of microorganisms in decomposition of complex or recalcitrant compounds (10 papers); the role of anaerobes and their occurrence in soil (7 papers); and perspectives of the influence of man on microbial communities in soil (5 papers). An epilogue contains some recent developments in the field of microbial ecology and mentions some items which might be fruitful areas for new research.

Price: £ 40.00.

Order to: Elsevier Applied Science Publishers, Crown House, Linton Road, Barking, Essex IG11 8JU, England.

Relief-Boden-Paläoklima 4. Studien zur Tropische Reliefbildung. Gebr. Borntraeger, Berlin and Stuttgart, 1986, vii + 225 p., with 121 figures and photos. ISBN 3-443-09004-4. Series: ISSN 0720-4876.

This new issue in the series Relief-Boden-Paläoklima has two contributions. The first by J. Büdel and edited by D. Busche on tropical landforms in south India, the second by R. Mäkel on relief development in the semi-arid lands of northern Kenya.

Southern Deccan in India, being a prime example of a humid tropical landform association of a broad etchplain studded with inselbergs, all cut into the ancient crystalline rocks of a part of Gondwana, was selected for Büdel's study of tropical landform development. Its principal result was the identification of the 'mechanism of double planation', by which etchplains have been or are still being formed under a seasonal tropical climate. In the second paper, Mäkel discusses a landscape ecological research in northern Kenya, in which emphasis is put on the relationship between the vegetation cover and morphodynamics with regard to present-day processes, as well as to the relief development during Late-Quaternary times. A decisive change in the ecosystem was caused by man in the last 10-15 years. The contributions are in German and have English summaries.

Price: DM 118.00.

Orders to: Gebrüder Borntraeger Verlagsbuchhandlung, Johannesstraße 3A, D-7000 Stuttgart 1, Fed. Rep. of Germany.

Dictionnaire de Science du Sol. J. Lozet et C. Mathieu. Technique et Documentation-Lavoisier, Paris, 1986, 269 p. ISBN 2-85206-342-5.

Nombreux sont les termes utilisés en pédologie, en science du sol et dans les autres disciplines traitant de l'analyse des paysages et de l'utilisation et de la conservation des terres.

Des dictionnaires, lexiques, listes diverses ont été élaborés en ce domaine et diffusés dans les années antérieures. Cependant, compte tenu de l'évolution rapide de notre science, il était devenu indispensable de concevoir un recueil des termes utilisés par l'ensemble des scientifiques et techniciens se préoccupant des sols.

Ce dictionnaire donne la définition de plus de 2.400 termes spécifiques à la pédologie, la science du sol et autres disciplines traitant de l'analyse des paysages et de l'utilisation et de la conservation des terres. Il est illustré de 43 photos ainsi que de nombreux tableaux et figures.

L'index constitue, avec ses 2.400 mots, un véritable dictionnaire anglais-français de Science du Sol. Des annexes donnant: les ordres, sous-ordres et grands groupes de la Soil Taxonomy (1975); les classes et sous-classes de sols de la classification Française CPCPS (1967); les unités pédologiques de la Carte mondiale des sols FAO-Unesco; et l'appellation ancienne et nouvelle des horizons accentuent le côté pratique de ce dictionnaire.

Les termes définis recouvrent la pédologie générale, la minéralogie, la pétrographie, la micromorphologie, la géomorphologie ainsi que l'application des grands systèmes de classification. Dans ce dictionnaire est inclue aussi un index anglais-français. Il sera, à ce titre, indispensable aux pédologues, agronomes, géomorphologues, géographes, forestiers et tous spécialistes s'occupant d'un aspect du sol ou de la couverture superficielle de la terre.

Price: FF 320.

Ordres: Lavoisier, 11, rue Lavoisier, F-75384 Paris Cedex 08, France.

Interactions of Soil Minerals with Natural Organics and Microbes. SSSA Special Publication 17. P. M. Huang and M. Schnitzer, editors. Soil Science Society of America, Madison, 1986, xiv + 606 p. ISBN 0-89118-778-2.

The top 20 to 50 cm of soil surface is an area of intense chemical, physical, and biological activity. Change in form and composition of materials located in this zone is expected. Carbon-containing compounds, in particular, are subject to degradation and it is an unusual compound that does not undergo appreciable change over time. Simpler carbon-containing compounds often serve as an energy source for microbes, or they become more condensed and increase in stability to form part of the more permanent organic fraction in the soil. Either way, these simpler organic compounds are sure to change with time.

Society has many environmental concerns, particularly in the disposal of synthetic organic compounds that have various biological toxicities. Many of these compounds require careful handling and disposal. It is in the best chance to persist in their toxic form if exposed at the soil surface. In fact, evidence is accumulating which leads some to believe that many organic compounds have a predictable half-life in surface soil. It would serve society well to accumulate all of the evidence possible in such matters of great concern to many people so the most practical and economical decisions are reached.

The objective of this special publication was to bring together new knowledge on: (i) how soil minerals affect the dynamics and transformations of natural organics and metabolic processes, growth, adhesion and ecology of microbes, and (ii) how natural organics and microbes affect mineral weathering transformations, pedogenesis, aggregate formation, and surface properties and reactivities of soil minerals with respect to nutrients and environmental pollutants. In this publication, an attempt is made to identify present and future research needs and to stimulate research leading to an integration of knowledge on 'soil minerals-natural organics-microbes' and their impact on soil development, agricultural production, and environmental protection. This publication will be of use to students and scientists in the soil and environmental sciences and to those who are involved in teaching and research in these disciplines.

Price: US\$ 30.00, plus 75 cents per book on all orders outside the U.S.A. Prepayment required.

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

Symposium Proceedings ISSS Working Group on Remote Sensing for Soil Surveys. ITC Journal 1986-1. ITC, Enschede, 1986.

This issue of the ITC Journal contains 14 papers and 13 texts of poster presentations, delivered at the 4th symposium of the ISSS Working Group on Remote Sensing for Soil Survey, held at Wageningen and Enschede, The Netherlands, in March 1985. The organizing committee was chaired by F. W. Hilwig of ITC, Vice-president of the Working Group.

The proceedings also contain a summary of three workshops and plenary session.

Price: Dfl. 20.00 by International Postal Money Order.

Orders to: ITC, P.O. Box 6, 7500 AA Enschede, the Netherlands.

Trace Elements in the Terrestrial Environment. D. C. Adriano. Springer-Verlag, New York, Berlin, Heidelberg, Tokyo, 1986, xix + 533 p. ISBN 0-387-96158-5 (U.S.A. ed.), 3-540-96158-5 (German ed.).

The ever-increasing production and demand for some elements in developed and developing countries suggest the mounting probability of their dispersal and contact with the environment. An element may be dispersed from the time its ore is being mined to the time it becomes usable as a finished product or ingredient of a product. In addition, increasing demands for fertilizers in high-production agriculture may enhance this probability. Land disposal techniques that seem promising for agricultural wastes and other solid wastes may also increase the metal burden of the soil. Trace element research has been intense during the last three or so decades. At stake are the integrity and quality of the world's land resources.

In many instances, the inputs from anthropogenic sources exceed the contributions from natural sources by several fold. Thus, it has become evident that human activities have altered the global cycles of trace elements.

Current universal interests in trace elements studies are being spurred by the needs to (1) increase food, fiber, and energy production; (2) determine trace element requirements and tolerance by organisms, including relationships to animal and human health and disease; (3) evaluate the potential biomagnification and biotoxicity of trace elements; (4) understand trace element cycling in nature, including their biogeochemistry; (5) assess trace element enrichment in the environment by recycling wastes; (6) discover additional ore deposits; and (7) comply with stringent state and federal regulations on release of effluents (both aqueous and gaseous) to the environment.

In all, 12 elements are discussed in detail; the less important trace elements are discussed together in one chapter. Each chapter in this book focuses on a particular element, which in turn is discussed in terms of its importance in our economy, its natural occurrence, its fate and behavior in the soil-plant system, its requirement by and detriment to plants, its health limits in drinking water and food, and its origin in the environment. Because of long-distance transport to pristine areas of cadmium, lead, copper, and zinc in relatively large quantities, these elements have an extra section on natural ecosystems. A blend of pictorial and tabular data are provided to enhance understanding of the relevant information being conveyed. Since individual chapters are independent of one another, they are arranged alphabetically.

This comprehensive integrated discussion of the sources, occurrence, behavior, and biogeochemical cycling of trace elements in the terrestrial environment emphasizes on applications rather than on theory. It is written for students and specialists in agronomy, soil science, plant science, ecology, geochemistry, and other related disciplines.

Price: DM 228.00.

Orders to: Springer-Verlag, Tiergartenstrasse 17, D-6900 Heidelberg, Fed. Rep. of Germany; or: Springer-Verlag, 175 Fifth Avenue, New York, NY 10010, U.S.A.

Drip/Trickle Irrigation in Action. 2 Volumes. American Society of Agricultural Engineers, 1986, xxiv + 931 p. ISBN 0-444-42641-8 (set).

Drip/trickle irrigation is a very efficient method of supplying water to plants. It is a relatively new method or more precise placement of water, and even though it takes more knowledge to operate the equipment, it means more food and fiber for human survival. As the world population continues to increase, this means that water will have to be used the most efficient way known. With the increased use of drip/trickle irrigation for many crops, this method can produce greater quantities of food.

During the last 15 years, drip/trickle irrigation has experienced a tremendous increase in research and commercial use of this new irrigation method. In 1985, over one-half million acres of crops are being irrigated with this new technique. Not only in the arid areas is drip/trickle being used, but it is used in humid areas which need supplemental water during dry periods. New improved drip/trickle equipment, to utilize the water application more efficiently, is continually being developed.

The present publication contains the proceedings of the Third International Drip/Trickle Irrigation Congress, held in Fresno, California, U.S.A. in November 1985. It was convened to highlight the large amount of new knowledge and information obtained by researchers, manufacturers, and growers throughout the world. Fresno, California, was chosen as the conference site because of the area's tremendous interest in drip/trickles irrigation. The Congress was organized to achieve the following objectives: 1. To present the latest developments in research, equipment, adaptation, and usage of drip/trickle irrigation systems worldwide; 2. To facilitate multidisciplinary interaction and technology transfer among researchers, designers, managers, and users of drip/trickle irrigation around the world; 3. To identify new challenges and opportunities for drip/trickle irrigation in the next decade. For the Congress, there were four invited papers, 135 oral papers, and 21 poster papers scheduled for presentation. The manuscripts were critiqued and are contained in the body of this Proceedings.

Price: Dfl. 230.00 or approx. US\$ 85.00.

Orders to: In U.S.A. and Canada: American Society of Agricultural Engineers, 2950 Niles Road, St. Joseph, MI 49085-8659, U.S.A. Elsewhere: Elsevier Science Publishers, P.O. Box 211, 1000 AE Amsterdam, The Netherlands.

Soil Map of the European Communities 1:1 000 000. Dir.-Gen. for Agriculture, Coordination of Agricultural Research. Commission of the European Communities, Luxembourg, 1985, 9 sheets and explanatory text of 124 p. ISBN 92-825-5428-7.

The map is presented as seven sheets with two sheets of legend. The legend comprises each of the 312 map units, which consists of associations of soil units. Each association is composed of a dominant soil and of associated soils and inclusions. The soil units are those adopted for the FAO/Unesco Soil Map of the World.

The accompanying explanatory text of over 120 pages gives details of: the preparation of the map; classification and definitions of soil and map units; climate, geology and vegetation; description of the soil associations; land use and suitability; profile descriptions and analytical data. For more information, see the enclosed brochure.

Price: Boxed set with maps folded to A4 size, Dfl. 250 or DM 220, including postage. Flat maps in roll, text separate, Dfl. 280 or DM 250, including postage. Prices only apply when ordered at ISRIC.

Orders to: see below.

Soil Map of Middle Europe 1:1 000 000. International Society of Soil Science, Wageningen, 1985. 1 sheet and explanatory text of viii + 124 p.

This publication is based upon the above mentioned map, plus the soil maps of Austria and Switzerland, which are not contained in the EEC map. It follows the system adopted for the Soil Map of the European Communities.

The explanatory booklet not only contains all of the information in the booklet of the EEC map, but also has a listing of the Austrian and Swiss soil data.

Price: Dfl. 55, DM. 50, or US\$ 25, including postage. Prices only apply when ordered at ISRIC.

Orders to: ISRIC, P.O. Box 353, 6700 AJ Wageningen, the Netherlands.

Thin Section Preparation of Soils and Sediments. C. P. Murphy. AB Academic Publishers, Berkhamsted, 1986, x + 149 p. ISBN 0-9707360-04-1.

The increasing awareness of the importance of soil micromorphological studies has created a need for information on methods for the preparation of thin sections of undisturbed soil materials. For this reason, the Sub-Commission on Soil Micromorphology of the ISSS in 1983 has decided to invite C. P. Murphy to review the existing techniques. His approach was to circulate a detailed questionnaire to all laboratories around the world known to be engaged in the making of thin sections. Mr. Murphy has subjected the replies to a scrutinizing analysis and so made a comprehensive survey of the knowledge on the consolidation of soil and porous soft materials, and the preparation of microscopic specimen thereof.

The ten chapters cover subjects such as the problems encountered in impregnation, sampling techniques, types of impregnant, sawing, grinding, polishing, mounting and finishing the hardened sample. Wide attention is paid to the experience in methods and materials of many workers. Two appendices include the addresses of many manufacturers and suppliers of impregnants, equipment and materials. There is a list of over 100 references.

The book is highly recommended, particularly to those starting a laboratory. Well-established laboratories will also find some useful suggestions for improving their methodology.

Price: £ 18.95.

Orders to: AB Academic Publ., P.O. Box 97, Berkhamsted, Herts. HP4 2PX, England.

D. Creutzberg, Wageningen.

Behaviour of Herbicides in Soil: Simulation and Experimental Assessment. J. J. T. I. Boesten. Doctoral thesis, Wageningen Agricultural University, 1986, x + 263 p.

The mathematical models of the transport and the transformation rate of herbicides in soil that are available in the literature and the tests done on them are reviewed.

A simulation model of the transport of herbicides in field soil, based on the best model available in the literature, was developed. The detailed field experiments carried out on a bare loamy sand soil with two soil-applied herbicides (cyanazine and metribuzin) in spring and summer to test this model are described.

A new sub-model for the evaporation of water from bare soil was developed and tested in the field, with acceptable results. Testing the herbicide transport model against the concentration profiles measured in the field, showed that calculated penetration of the two herbicides in soil at a few months after application was much deeper than that measured.

To elucidate the cause of the discrepancy between calculations and measurements, the sorption of the two herbicides onto soil collected from the experimental field was studied in detail in laboratory experiments. Based on these studies a new model for the sorption of the herbicides was developed and incorporated into the transport model. The main new element in this model was a sorption process that equilibrates at a time scale of months. A comparison between concentration profiles calculated with the new model and those measured in the field showed that the new model successfully explained the field measurements.

Price: Dfl. 40.00, including postage.

Orders to: Institute for Pesticide Research, P.O. Box 650, 6700 AR Wageningen, The Netherlands.

Berichte XIII. Congress der IBG/Transactions XIII Congress of the ISSS/Comptes-rendus XIII^e Congrès de l'AISS. Hamburg, 13-28.8.1986. 4 Volumes, 1986, 1801 p.; 2 Volumes in print.

The first four volumes contain the texts of the plenary papers (vol. 1, 128 p.) and the extended summaries of all papers presented (vol. 2-4, 1673 p.). The majority is in English; papers in other languages also carry on English abstract.

The fifth and sixth volume, to be available early 1987, will contain the symposia papers. For more information, see this Bulletin.

Price: For all 6 volumes Dfl. 75.00 or US\$ 35.00, including packing and postage.

Orders to: ISRIC, P.O. Box 353, 6700 AJ Wageningen, the Netherlands.

Applied Microbiology. Trends in Scientific Research No. 2. H. W. Doelle and C. G. Hedén, editors. D. Reidel Publ. Comp., and Unesco, 1986, xviii + 192 p. Hardback ed., D. Reidel Publ. Comp., Dordrecht, Boston, ISBN 90-277-2095-9. Paperback ed., Unesco Paris, ISBN 92-310-2335-7.

Unesco, in cooperation with the International Council of Scientific Unions (ICSU), and a number of international and national institutions is publishing a series of monographs 'Trends in Scientific Research'. Each monograph will be complete in itself, but will be linked to the others by a central theme - that of developments at the forefront of science of special interest to humankind.

The monographs will be interdisciplinary in character, bring together not only research in several disciplines but also the applied as well as the basic aspects of science, and in particular the uses of science in forecasting and in problem solving. Special attention will be paid to the use of science in the fulfilment of human needs. The monographs are addressed to decision makers, to scientists interested in disciplines other than their own, the educated man in the street, and so on.

Inasmuch as there will be a focus on applied aspects of the subjects treated, the monographs will also be of use in highlighting those types of scientific research most relevant to the requirements of developing countries and those fields of research and developments.

The present volume on trends in applied microbiology and biotechnology is aimed at showing the achievements, trends and future scope of biotechnology in developing countries. It has eight chapters on: Culture collection technologies and the conservation of our microbial heritage; Microbial process development in biotechnology; Single-cell protein technology; Biogas production in China; Appropriate biotechnological systems in the arid environment; microbiology: global aspects; The scale-factor paradox in biotechnology; and Biotechnological considerations in research and development.

Price and Orders to: Hardback ed.: Dfl. 90.00. In U.S.A. and Canada: Kluwer Academic Publ., 190 Old Derby Street, Hingham, MA 02043, U.S.A. Elsewhere: Kluwer Acad. Publ. Group, P.O. Box 322, 3300 AH Dordrecht, the Netherlands. Paperback ed.: FF 150.00. Unesco Sales agents the world over, or, in case of difficulties, Unesco Press, 7 place de Fontenoy, F-75700 Paris, France.

... and the Desert Shall Rejoice. **Conflict, Growth and Justice in Arid Environments.** A. Maass and R. L. Anderson. Robert E. Krieger Publ. Comp., Malabar, 1986, 447 p. ISBN 0-89874-908-5.

This book contributes to an understanding of the forces that have influenced economic, political, agronomic, and hydraulic development in the world's arid and semi-arid regions. The irrigated areas selected for study are the intensely cultivated 'huertas' that surround or adjoin the towns of Valencia, Murcia-Orihuela, and Alicante in Spain and the South Platte-Cache La Poudre, Utah, and Kings River valleys in the United States.

The authors found that the objectives sought by the six irrigation communities in Spain and America were the same in broad outline. There were differences in the relative importance that each community attached to the several objectives, but these were not as large as they had expected. The most powerful conclusion that emerged from each of the case studies was the same, namely, the extent to which water users had controlled their own destinies as farmers, the extent to which the farmers of each community, acting collectively, had determined both the procedures for distributing a limiting water supply and the resolution of conflicts with other groups over the development of additional supplies. With important variations to be sure, local control was the dominant characteristic of irrigation in these regions, regardless of the nationality or religion of the farmers, the epoch, whether formal control was vested in an irrigation community or in higher levels of government, the forms of government at the higher levels, and perhaps even the legal nature of water rights.

In each of the six regions attention was focused initially on the lowest organized units for managing water - irrigation districts, or communities, or companies - each of which is likely to serve a relatively small area. In all cases, however, these final distributors of water have, in their efforts to improve their water supplies, become parts of larger systems.

This book, in addition to contributing to our knowledge of economic and political development in arid regions, has had value in a more practical way, for planning and operating irrigation systems today. A simulation program was developed for the purpose of comparing alternative operating procedures in the six irrigated areas. Flow charts synopsise the operating procedures of the six systems. These are placed in an appendix. The upper portions of the charts show, in general, procedures for diverting water from stream flow and other sources into principal canals and laterals. The lower portions show procedures for distributing canal and ground water to individual farms.

Price: US\$ 32.50

Orders to: Robert E. Krieger Publ. Comp., Krieger Drive, Malabar, FL 32950, U.S.A.

Handbook for Soil Thin Section Description. P. Bullock, N. Fedoroff, A. Jongerius, G. Stoops, T. Tursina. Prepared under the auspices of the ISSS. Waine Research Publications, Albrighton, 1985, 152 p., colour and b/w plates. ISBN 0905184-09-2.

The present Handbook sets forth the efforts of the Working Group on Soil Micromorphology to arrive at an internationally acceptable classification of micromorphological characteristics that could be used for the description of thin sections. The book represents the results of many discussions and deliberations of an international group of experienced soil scientists. It has been attempted to keep continuity with existing concepts and to restrict the introduction of new terminology as much as possible.

The proposed system, like other recent international classification systems in soil science, bears the marks of numerous compromises. This, however, should not deter the specialist from seriously considering its merits. Time is due to make a sincere attempt to come to some degree of uniformity in the description of thin sections. The proposed system could very well serve as a basis. Users are requested to make suggestions for improvement so that the Handbook can be strengthened with time.

The volume contains nine chapters, two appendices, a list of references and an index of terms. The first four chapters present a general discussion on the approach to thin section description, basic concepts and general descriptive criteria. The following chapters each deal with one of the main headings of description, viz. microstructure, basic mineral components, groundmass and pedofeatures. At the end of each chapter is a checklist to facilitate description. There are over 120 colour photomicrographs and numerous black and white plates and diagrams. In appendix I, a system for computer compatible recording is given. Appendix II contains 6 examples of thin section descriptions.

The book is strongly recommended as a working manual for students and non-specialists and as a guide for specialists.

Price: £ 20.00, post free worldwide.

Orders to: Waine Research Publications, Mount Pleasant, Beamish Lane, Albrighton, Wolverhampton, England WV7 3JJ.

D. Creutzberg, Wageningen

Soils of New Jersey. J. C. F. Tedrow. Robert E. Krieger Publ. Comp., Melbourne, 1986, 512 p. ISBN 0-89874-897-6.

This book is a comprehensive report on the soil characteristics and the soil distribution pattern throughout the state. Starting with H. D. Rogers' report on New Jersey's soils, the author reviews the literature and discusses developments in pedology and soil classification within the state over the past century and a half. The author follows a classical approach to the subject, using as a base the writings of V. V. Dokuchaev and C. F. Marbut.

Formal soil investigations in New Jersey began in the mid-1800s, during which time two geologists were already identifying various soil patterns throughout the state. A soil map of New Jersey published in 1874, shows delineations and boundaries which are, in principle, still largely valid. A more comprehensive soil survey program was undertaken in 1901. The program was subsequently expanded under J. G. Lipman, and, by the mid-1920s, the one-inch-per-mile survey of the state had been completed. Lipman realized the importance of providing laboratory data to augment the surveys, and he accumulated extensive chemical and physical data according to soil type. Since about 1940 nearly all of the state has been resurveyed one or more times.

One of the main objectives of this volume is to show how soil names have been used by various investigators during this developmental period. The second objective is to describe the numerous soil patterns and record their most important properties throughout the state. Nearly all discussions focus on natural soil properties; therefore, changes in soil resulting from additions of fertilizers and lime materials, pollution, erosion, tillage, and other farm management practices are not within the scope of this presentation. The third objective is to draw together in one volume the more important soil literature relating to soil characteristics. Discussions are limited mainly to soil genesis, soil morphology, and soil geography.

Price: US\$ 52.50.

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

Glossary of Fertilizer Terms (English, French, German and Spanish). IFA Ltd., Paris, 71 p.

This multilingual glossary was prepared by a group of experts brought together for the purpose by the Agricultural Committee of IFA.

The glossary cannot pretend to be comprehensive and terms and expressions are included mainly on the basis of their importance in the field of fertilizer usage, with a few relating to soil science, fertilizer manufacture and analysis, application machinery and methods.

In each language section the terms are arranged in alphabetical order, with a brief definition and with cross reference, whenever possible, to the nearest equivalent in the other three languages. In some cases, however, no equivalent term exists, so that there are different number of entries in the four sections. It should also be noted that the precise meaning of the nearest equivalent may differ to some extent between languages. There are 174 English, 220 French, 226 German and 196 Spanish terms. At the end of the brochure there is a multilingual table of the main fertilizer types.

Orders to: IFA, 28 rue Marbeuf, F-75008 Paris, France.

Air Pollution and Plants. C. Troyanowsky, editor. VCH Verlagsgesellschaft, Weinheim, 1985, x + 298 p. ISBN 3-527-26310-1. Hardbound.

For a number of years, in many countries, heavy damage has been noticeable to flora and fauna, to sweet and salt waters. This damage is manifold, and pollution seems to strike in many places: the Danube and Rhine, both polluted by the refuse from the mines, power stations, steel mills, collieries, oil refining plants and the chemical industries. Roughly the same group bear the responsibility for the pollution of the Mediterranean, the Black sea or the American Great Lakes. In Scandinavia the lowering of the pH of sweet waters, and its resulting effects, are well known. Many rivers and lakes are polluted, soil pollution is in places a serious problem, and underground waters pollution, although less frequent, can have devastating consequences. Now air has not yet been mentioned, but it can carry, sometimes over very long distances, a major part of the pollutants, which can eventually reach the ground and be turned into soil and water pollution, reach the troposphere and stratosphere and be a grave cause for concern.

The present publication deals with the influences of air pollution on plants. The contributions presented are careful and accurate descriptions of facts and reports about research work aimed at elucidating underlying causes and mechanisms as well as consequences. Main topics are the transport of air pollutants, atmospheric chemistry as a source of aggressive compounds, and direct and indirect effects of air pollutants on plants. It is established that damage to plants can continue to increase even though pollution decreases. Thus long-term and accumulation effects have to be considered as well as a synergy between pollutants and other harmful agents, each of which would not be detrimental by itself. The book provides a cross-sectional view of efforts by European researchers to understand and evaluate the multitude of factors that affect the health of plants and trees. It will be of interest to persons scientifically interested in the causes of the dying forests.

Price: DM 120.00.

Orders to: VCH Verlagsgesellschaft, P.O. Box 1260/1280, D-6940 Weinheim, Fed. Rep. of Germany. In U.S.A. and Canada: VCH Publishers, 303 N.W., 12th Avenue, Deerfield Beach, FL 33442-1705, U.S.A.

International Symposium on Distribution, Characteristics and Utilization of Problem Soils, Tsukuba, October 1981. Tropical Agricultural Research Series 15. Japanese Society of Soil Science and Plant Nutrition, Tokyo, 1982, 417 p. ISSN 0388-9386.

One of the activities of the Tropical Agriculture Research Center is to hold international symposia for exchanging information and views among scientists from different countries concerned. Since 1967, the symposia have been held every year, covering such subjects as crop diseases, animal production, methods of crop breeding, optimization of fertilizer effect, water management in paddy fields, silvicultural technologies, etc.

The present symposium, the fifteenth of this kind, has given the opportunity to consider various aspects relating to problem soils in the tropics and the subtropics. These soils which are highly weathered and have a low content in nutrients due to intrinsic causes such as the presence of 'variable charge' or external factors related to inadequate cultural practices or environmental conditions are characterized by a low fertility which is a major constraint to the increase of agricultural production in these regions. Since such soils are frequently observed in the tropics, it is essential that their extract distribution be correctly evaluated if methods to improve their productivity are to be developed. It is also realized that in addition to the application of chemical fertilizers which is often out of reach of the average farmer in the tropics, more practical methods of soil conservation and management such as the use of cover crops, incorporation of crop residues or animal wastes into soil, minimum tillage should be promoted to prevent further deterioration of soil fertility and water regime. After country reports on conditions in Brazil, and seven Asian countries, this book contains the texts of the six introductory lectures and 17 technical reports, mostly on problem soils in Asia. The book closes with a general discussion.

Price: US\$ 35.00 plus \$ 4.00 shipping charges.

Orders to: Int. Specialized Book Services, 5602 NE Hassalo Street, Portland, OR 97213-3640, U.S.A.

Ando Soils in Japan. K. Wada, editor. Kyushu University Press, Tokyo, 1986, 276 p. + 16 colour plates. ISBN 4-87378-129-9.

The past few years have witnessed a rapidly expanding knowledge on Ando soils, the soils formed on volcanic ash and having very distinctive properties as compared with soils formed on other parent materials. Classification of Ando soils (Andosols, Andepts, Andisols) has thusfar been hampered by a meagre global documentation and correlation. In this respect, this book on Ando soils in Japan is a very valuable and timely contribution as it gives a state-of-the-art in Japan (where Ando soils are so prominent and where so many prominent scientists study these soils) as well as a wealth of soil data. It resulted from a number of government supported Cooperative Research Projects aimed at international correlation of Japanese volcanic ash soils.

Part I consists of monographs on the following topics: 1. Morphology and classification; 2. Mineralogical characteristics (including clay mineralogy); 3. Humus characteristics; 4. Chemical properties; 5. Physical properties. Part II contains the description and analytical data of 25 pedons as well as the analytical methods according to which all pedons were analyzed. Included are 16 colour photographs of Japanese Ando soils.

Price: 10.000 Yen.

Orders to: Katakura Libri, Inc., 36-9 Hongo 3-chome, Bunkyo-ku, Tokyo 113, Japan

L. P. van Reeuwijk, Wageningen.

Sol et Eau/Suelo y Agua. Actes du Séminaire de la Havane, 8-20 Avril 1985/Actas del Seminario de la Habana, 8-20 Abril 1985. Collection Colloques et Séminaires. Editions de l'ORSTOM, Paris, 1986, 767 p. ISBN 2-7099-0833-6. ISSN (série) 0767-2896.

Depuis plus de 50 ans, et particulièrement ces dernières décades, les pédologues cubains ont réalisé de très nombreux travaux sur la caractérisation des sols, l'étude de leurs constituants, les cartographies, leur classification, etc. En 1972, une coopération franco-cubaine s'est établie dans ce domaine et a permis de fructueux échanges tant sur le terrain qu'en laboratoire.

Il est paru opportun de faire le point des connaissances acquises en organisant un Séminaire franco-cubain sur le thème 'Le Sol et l'Eau'.

Ce Séminaire devait permettre d'élargir la coopération à divers pédologues français et latino-américain. Les rencontres ont suscité non seulement la mise en place de programmes bien définis dans le cadre de la coopération existante, mais aussi des échanges et des projets d'études entre chercheur français et cubains.

Les Actes qui concrétisent les travaux des réunions sont publiés dans cet ouvrage, en Espagnol ou en Français. Sont également présentées deux études ayant illustré certains exposés du Séminaire.

Commandes à: Editions de l'ORSTOM, 70 route d'Aulnay, F-93140 Bondy, France.

Quantitative Hydrogeology. Groundwater Hydrology for Engineers. Ghislain de Marsily, translated from French by Gunilla de Marsily. Academic Press, Orlando, London, 1986, xix + 440 p. ISBN 0-12-208916-2 (paperback); 0-12-208915-4 (hardback).

This book attempts to combine two separate themes: a description of one of the links in the chain of the water cycle inside the earth's crust, i.e. the subsurface flow, and the quantification of the various types of this flow, obtained by applying the principles of fluid mechanics in porous media. This first part is the more descriptive and geological of the two. It deals with the concept of water resources, which then leads us on to other links in the cycle: rainfall, infiltration, runoff, and surface water resources. The second part is necessary in order to quantify groundwater resources. It points the way to other applications, such as solutions to civil engineering problems, including drainage and compaction, and solutions to transport problems in porous media, including aquifer pollution by miscible fluids, multiphase flow of immiscible fluids, and heat transfer in porous media, i.e., geothermal problems. However, the qualitative and the quantitative aspects are not treated separately but are combined and blended together, just as geology and hydrology are woven together in hydrogeology.

This book is intended for engineers with a mathematical background. They will find a fairly detailed description of the physical processes occurring in porous and fractured media followed by the development of the basic flow and transport equations for both steady and transient states. Outlines are given of the methods for solving these basic equations as well as the most common analytic expression used in handling practical problems. Basic geologic structures containing groundwater and the hydrologic processes occurring within them are described together with practical methods for measuring the relevant physical parameters of the media.

It is an enlarged and translated version of the original French edition entitled: Hydrogéologie quantitative, published by Masson, Paris, in 1981.

Price: US\$ 29.95, paperback; \$ 60.00 hardback.

Orders to: Academic Press, Orlando, FL 32887, U.S.A.; or: Academic Press, 24-28 Oval Road, London NW1 7DX, England.

Air Pollution and Stability of Coniferous Forest Ecosystems. Proceedings of the Symposium, Ostravice, October 1984. E. Klimo and R. Saly, editors. University of Agriculture, Brno, 1985, 395 p.

This symposium was co-sponsored by the ISSS Working Group of Forest Soils. Spruce forests, both natural and man-made, occupy large areas in the temperate and boreal zones and are of great ecological as well as economic importance in a number of countries. These forests play a prominent role in timber production, water conservation, erosion control, recreation, and execute other useful and protective functions within the contemporary landscape in both lowland and upland areas, especially in Europe. It is therefore of utmost importance to understand the factors and mechanisms determining the stability of spruce forests with respect to their production and non-production functions.

Over the last years, the declining condition of these forests due to air pollution in Central Europe and its further development raised the concern of many politicians, scientists and to a considerable extent also of the broader public.

The Institute of Forest Ecology of the University of Agriculture Brno, whose scientific programme is the study of ecological consequences of anthropogenic activity on spruce forest ecosystems, was the initiator and organizer of a symposium held in Ostravice, Czechoslovakia in October 1984. It was the goal of the symposium to evaluate the impact of immissions on soil processes and soil properties and to judge to what extent may the changes in soil be reflected in the health condition of forest stands. Another group of papers regards the effects of changes of the forest site on the physiological processes of forest tree species.

Altogether 32 papers and some discussion contributions are contained in these proceedings, providing a good selection of problems associated with the discussed topics.

The proceedings are, to limitent extent, free of charge.

Requests to: Ing. J. Marsalek, Inst. of Forest Ecology, Univ. of Agr., 64400 Brno-Sobesice, Czechoslovakia.

Describing and Interpreting the Macrostructure of Mineral Soils – A Preliminary Report. Techn. Bull. 1986-2E. J. A. McKeague, C. Wang and G. M. Coen. Land Resources Research Institute, Agriculture Canada, Ottawa, 1986, 47 p. ISBN 0-662-14620-4.

A revised approach is presented for the description and interpretation of soil macrostructure. Structure is defined so as to include the size, shape and arrangement of voids as well as aggregates. Limits are suggested of the minimum sizes of voids and peds that can be described reliably in the field. The importance is emphasized of a decision on the purpose before soil macrostructure is described and two levels of detail of description are presented. The simple system of macrostructure description outlined is considered to be adequate for many applied purposes. The detailed system presented is required for thorough characterization of benchmark pedons and for some applied purposes. The concept is supported that descriptions of macrostructure should be used in estimated soil properties important to the purpose at hand. Guidelines are proposed for estimated properties such as saturated hydraulic conductivity, available water, and air capacity from information on structure and other soil properties readily determined in the field. Measurements of soil properties are required periodically to check estimates based upon guidelines and to improve the guidelines if necessary. The usefulness of soil macrostructure description in assessing effects of land use on soil physical condition is documented.

Requests to: Land Resources Research Institute, Research Branch, Agriculture Canada, Ottawa, Ontario, Canada K1A 0C6.

Desert Environment and Agriculture in the Central Negev and Kadesh-Barnea during Historical Times. H. J. Bruins. Doctoral thesis, Wageningen Agricultural University, 1986, Midbar Foundation, Nijkerk, 1986, xi + 219 p. ISBN 90-7166601-8.

Land use based on local rainfall in the arid zone *sensu stricto* is often limited to pastoralism, sometimes combined with very marginal rainfed farming, unsuccessful in most years. A more sophisticated form of rainfed agriculture – runoff farming – has been practised in the central Negev and adjacent northeastern Sinai by a sedentary population in certain historical periods, particularly during Byzantine times from the 5th to 7th century A.D. The environment of the Runoff Farming District in the Negev is described, as well as the mechanics of rainwater-harvesting agriculture or runoff farming. Five systems of runoff farming are distinguished on hydro-geomorphic criteria. Calculations have been made about food production, based upon wheat yields, in relation to estimated population levels in the past. Besides runoff farming, oasis-irrigation agriculture in the region could only be practised at very few spots. The systems of irrigation agriculture are described, whilst the remnants of ancient aqueducts have been dated by radiocarbon. The valley stratigraphy and soil development have been investigated in detail, in relation to the tell, and in relation to ancient remnants of irrigation agriculture, dated by radiocarbon to the Bronze age and the 7th century A.D. A detailed chrono-stratigraphy has been established based upon radiocarbon dates. All the radiocarbon dates have been calibrated from conventional C-14 years into historical years. The carrying capacities of the Runoff Farming District and the Kadesh-Barnea – Quseima region have been calculated and the outcomes are compared with former population levels. The relationships between the landscape, climatic and agricultural history are evaluated. A clear time-correlation exists between valley aggradation and a relatively wet climate, as well as between valley incision and a relatively dry climate.

Price: Dfl. 45.00, including postage.

Orders to: Midbar Foundation, P.O. Box 78, 3860 AB Nijkerk, The Netherlands.

Desertification Control in Africa. Actions and Directory of Institutions. 2 Volumes. United Nations Environment Programme, Nairobi, 1985, 126 and 260 p.

One of the programme objectives of the UNEP Desertification Control Programme Activity Centre has been to promote the transfer of desertification control methods successfully utilized in African countries. One of the strategies adopted to accomplish this objective is the preparation of directories providing information on individuals, institutions and activity programmes. This facilitates the exchange of information and expertise on desertification matters, mainly among the countries of the Sudano-Sahelian region.

Volume I of the present publication contains a survey of available information and experience on desertification control activities and technology during the past five years, and the performance of past and current projects and programmes considered to have potential for replication in other African countries. It is divided into three parts, one for the subregions, North Africa, Sudano-Sahelian region and Eastern and Southern Africa, and each part has an introductory summary to facilitate a comparison of levels of anti-desertification activity.

Volume II is a directory of institutions involved in research and training or in the implementation of desertification control programmes, and lists available manpower in terms of scientists and specialists. Each chapter contains information on national, regional and international organizations and institutions. Scientists and specialists are listed under the institutions. For the countries of the Sudano-Sahelian region, information on institutions was gathered from various sources, including field project personnel and consultants. In both volumes there are likely to be information gaps in respect of activities, institutions and lists of scientists and specialists, and UNEP hopes that both the institutions concerned and knowledgeable individuals will co-operate in filling these gaps by forwarding additional information.

Requests to: Desertification Control Programme Activity Centre, UNEP, P.O. Box 30552, Nairobi, Kenya.

Proceedings of an International Workshop on the Structure of a Digital International Soil Resources Map annex Data Base, Wageningen, January 1986. M. F. Baumgardner and L. R. Oldeman, editors, ISSS, Wageningen, 1986, 138 p. ISBN 90-71556-02-6.

These proceedings contain the papers and a summary of the deliberations of a workshop which was held in Wageningen, the Netherlands, to consider the feasibility and desirability of preparing a global soils and terrain digital database. A background paper for the workshop appears in the appendix of the proceedings. During the meeting 40 participants from 19 countries heard and discussed 5 invited papers related to global environmental databases, 6 presentations on technical considerations for development and implementation of a world soils and terrain digital database.

The final 2 days of the Workshop were devoted to the activities of 3 subgroups to consider different issues related to a world soils and terrain digital database, including map and attribute data. The first subgroup defined objectives and suggested 21 priority areas for inclusion in the development phase of the base. The second subgroup prepared a description of potential uses and users of a world soils and terrain database. The third subgroup dealt with the conceptualization of such a database and issues related to a 'universal' map legend, correlations among national maps and different classification systems, and a minimum set of parameters (physical, chemical, biological) to be included.

During the discussions on the final day of the Workshop, there was consensus among the participants that a recommendation be made to ISSS Commission V in support of producing a world soils and terrain digital database at an average scale of 1:1 million. A subgroup was named to begin work on a legend for a world soils and terrain map, and a minimum data set for attribute data to be entered into the database. Another subgroup was requested to prepare a draft proposal for a project to develop a world soils and terrain digital database at an average scale of 1:1 million.

Price: Dfl. 20.00, plus postage.

Orders to: ISSS, P.O. Box 353, 6700 AJ Wageningen, the Netherlands.

Computerized Land Evaluation Data Bases in the European Communities. Catalogue of a Questionnaire Survey, 1st ed., 1985. A. H. Nørr, editor. Commission of the European Communities, Luxembourg, 1986, 276 p. ISBN 92-825-5838-X. EUR 10195 EN.

Due to the increasing demands on the land of the EC there is a pressing need for standardized information on this resource, including data on the potential for different forms of land use, e.g. agriculture, forestry, grass, cereals, etc.

It is generally recognized that soil, water, climatic and topographic information is indispensable in helping to solve problems regarding the management of natural resources. Such information is essential for calculating costs of inputs and potential yields in the production system and for decision making having regard to the rural environment.

The advanced development of computer based geo-information systems allows rapid processing of a large body of geographically identified data bases. Most EC-member countries have already computerised their own land resource data. On this concept a catalogue of computerised land data bases within the EC was established by means of a questionnaire form. This catalogue provides the initial step to an assessment of the comprehensiveness, availability and usability of land resource data in EC context. It also serves as a tool for basic information and exchange of knowledge through monitoring of the current state in the field of the member countries by periodic update and revision.

The catalogue comprises key-information on data bases with geographically identified variables concerning the basic topics of soil, water, climate and topography as well as other physical factors connected to natural and environmental resources.

The key-information associated with each national data base is arranged in three parts as follows: Descriptions of main data definitions, organisation, data availability, storage media, objective, description and application of data, coverage and completeness, etc; Specification of data base variables, table of spatial resolution, measurements units, sources, scale and storage formats; Review of computer software packages, definitions, availability and documentation combined with computer hardware and retrieval graphics facilities.

This fifth draft of the catalogue contains information on 102 data sets/bases, in 8 EC member countries.

For comments/requests contact the editor: Dr. A. H. Nørr, Bureau of Land Data (ADK), Enghavevej 2, DK-7100 Vejle, Denmark.

Price: ECU 19.06, £ 11.80, US\$ 17, in loose-leaf binder.

Orders to: Commission of the European Communities, Office for Official Publications, Sales Service, BP 1003, L-2985 Luxembourg.

Advances in Soil Science. B. A. Stewart, editor. Volume 4. Springer-Verlag, New York, Berlin, 1986, viii + 226 p. ISBN 0-387-96247-6 (U.S.A. ed.), 3-540-96247-6 (German ed.). Hardbound.

The aims of this new series and the contents of volumes 1-3 have already been announced in earlier Bulletins. The present volume contains an interesting write-up of the history of soil physics and three reviews on nitrous oxide emission from soils, the characterization and modelling of chemical transfer to runoff and on the agronomical and ecological impact of irrigation on soil and water salinity.

Price: US\$ 48.00.

Orders to: Springer-Verlag, 175 Fifth Avenue, New York, NY 10010, U.S.A.; or: Tiergartenstrasse 17, D-6900 Heidelberg, Fed. Rep. of Germany.

Einführung in die Bodenkunde. 2. Auflage. E. Schlichting. Pareys Studentexte 58. Verlag Paul Parey, Hamburg und Berlin, 1986, 131 S., 43 Abb. und 8 Tabellen. ISBN 3-490-20015-2. Kartoniert.

Mit der Bedeutung von Umweltproblemen ist der Bedarf an naturwissenschaftlich begründeter, zugleich aber allgemein verständlicher Information über bodenkundliche Sachverhalte gestiegen.

Diese 'Einführung in die Bodenkunde' macht dem Naturfreund verständlich, daß nicht nur 'die oberen 30 cm, von denen wir leben', die Pflanze versorgen, dem Planer, daß Bodenzerstörung durch Landverbrauch nicht nur Verlust an Grünflächen bedeutet, und dem Bodennutzer, daß seine Eingriffe längerfristig und großräumig wirken als meist angenommen. Ihnen allen aber wird veranschaulicht, daß es nicht 'den Boden' schlechthin gibt, sondern deren viele, die sich in Bau und Verhalten wesentlich unterscheiden. Darum werden im Hauptteil des Buches Entstehung, Eigenschaften und Nutzung von Böden typischer Landschaften Mitteleuropas eingehend behandelt. Daraus werden allgemeine Schlüsse auf das Wesen von Böden als Umwandlungsformen von Gesteinen, als erdsgerichtliche Urkunden, als Landschaftselemente sowie als Pflanzenstandorte und Filterkörper gezogen, die von speziellem Interesse sein dürften. So wird die Einsicht vermittelt, daß die Bodenkunde als ökologische Geowissenschaft gleichermaßen von hohem intellektuellem Reiz wie von großer praktischer Bedeutung ist.

Preis: DM 29,80.

Bestellungen an: Verlagsbuchhandlung Paul Parey, Spitalerstrasse 12, D-2000 Hamburg 1, Bundesrepublik Deutschland.

Soil erosion in the European Community. Impact of Changing Agriculture. G. Chisci and R. P. C. Morgan, editors. A. A. Balkema Publishers, Rotterdam and Boston, 1986, x + 233 p. ISBN 90-6191-657-7, hardbound. EUR 10419 EN.

The unprecedented push towards higher crop productivity and lower costs, made possible by the technological revolution in agricultural management, introduced into the agricultural ecosystem a cycle of soil degradation due to hydrological phenomena with the power of damaging both soil fertility and the landscape in a devastating and permanent way. Especially in the Mediterranean environment accelerated runoff and erosion were detected in cultivated sloping areas to an extent previously unreported.

This volume contains the proceedings of a seminar on land degradation due to hydrological phenomena in hilly areas: impact of change of land use and management, held in Cesena, Italy, in October 1985, under the auspices of the EEC Directorate-General for Agriculture. The aims of the workshop were to demonstrate the state-of-the-art research with reference to a representative area in Italy, namely the Cesena pilot area, and to consider strategies for a better interchange of information and coordination of research on soil erosion and conservation between scientists in the various institutions of the European Community.

Price: Dfl. 70.00; US\$ 28.00; £ 20.00.

Orders to: A. A. Balkema Publ., P. O. Box 1675, 3000 BR Rotterdam, the Netherlands. In U.S.A. and Canada: A. A. Balkema Publ., P.O. Box 230, Accord, MA 02018, U.S.A.

Acid Deposition and the Acidification of Soils and Waters. Ecological Studies 59. J. O. Reuss and D. W. Johnson. Springer-Verlag, New York, Berlin, 1986, viii + 119 p. ISBN 3-540-96290-5 (German ed.), 0-387-96290-5 (U.S.A. ed.), hardbound.

One of the most pressing issues currently facing environmental scientists is the need to predict the effect of acid deposition on terrestrial and aquatic ecosystems. As is typical of issues concerning public policy, a great deal of controversy surrounds the discussion of both the nature and extent of acid disposition effects, as might be expected where decisions of great economic importance must be made on the basis of necessarily limited scientific knowledge. In the present book the authors focus on those systems in which acid deposition is most widespread and deleterious. They attempt to analyze the effect of acid deposition (1) on the soil-plant system and (2) on the composition of the solution that is released to surface waters and groundwaters. With the help of a quantitative model, the authors synthesize existing knowledge into a conceptual model consistent with established physicochemical principles and the bulk of information available.

In this book the linkage between effects on terrestrial and aquatic systems is elucidated. Although it is unrealistic to expect that such clarification will materially lessen the controversy surrounding the issue, perhaps it will help to focus scientific investigation on those processes most likely to control the effects of acid deposition on soils and water. Soil scientists, ecologists, limnologists, and environmental managers will find this book particularly useful for its insights into probably long-term effects of acid deposition, the formulation of testable hypotheses; and for guiding the design and interpretation of research.

Price: DM 94.00.

Orders to: Springer-Verlag, 175 Fifth Avenue, New York, NY 10010, U.S.A.; or: Springer-Verlag, Tiergartenstrasse 17, D-6900 Heidelberg, Fed. Rep. of Germany.

Técnicas y experimentos en Edafología (Methods of analysis of soil and experiments in soil science). J. Porta, M. Lopez-Acevedo and R. Rodriguez. Department of Soil Science, Univ. Politecnica de Catalunya, 1986, 282 p. ISBN 84-600-4341-X.

Este libro, dedicado a analisis de suelos, esta estructurado en cinco capitulos dedicados a preparacion de la muestra, determinaciones preliminares, determinaciones de propiedades fundamentales, determinaciones relacionadas con las sales solubles y caracterizacion de la fertilidad quimica, con un total de veinte tecnicas. En cada una de ellas se expone el objetivo del analisis; su fundamento, principales métodos, rango y sensibilidad, principales causas de error e interferencias y tendencias actuales; equipo, instalaciones y material; método operatorio; calculos y expresion de los resultados; interpretacion de resultados y discusion; ejercicios de tutoria y bibliografia. La obra, estructurada con numerosos cuadros y figuras da una vision clara y sistematizada de las diferentes partes que consituyen cada analisis, alcanza un gran valor didactico permitiendo una comprension profunda de cada procedimiento.

Precio: US\$ 35.00.

Pedidos a: Dr. J. Porta Casanellas, Univ. Politecnica de Catalunya, Avda. Rovira Roure, 177, 25006, Lerida, Espana.

Proceedings of the International Symposium on Red Soils. Edited by Institute of Soil Science, Academia Sinica. Science Press, Beijing and Elsevier. Science Publ., Amsterdam, 1986, vii + 785 p. ISBN 0-444-42645-0.

Since 1950, the Institute of Soil Science, Academia Sinica, with the cooperation of the local soil research organizations, has carried out a series of field and laboratory investigations on the tropical and subtropical soils in China. The materials and data accumulated in the past 33 years give a view of broad outline on the genesis, distribution, properties and management of the soils, particularly the red soils in South China.

Based on the above mentioned work, soil scientists were invited to attend the Symposium on Red Soils held in Nanjing in November 1983. They gave reports dealing with the red soils of Africa, Asia, Latin America, and Oceania. The Proceedings cover 33 papers. In addition, many of the participants joined the post-symposium excursion in South China. Some illustrations of soil profiles in the red soil region observed during the excursion are given in the appendix.

Price: Dfl. 240.00.

Orders to: In the People's Republic of China: Science Press, Beijing, in U.S.A. and Canada: Elsevier Science Publ., 52 Vanderbilt Avenue, New York, NY 10017, U.S.A. Elsewhere: Elsevier Science Publ., P.O. Box 211, 1000 AE Amsterdam, the Netherlands.

New Journals/Nouveaux Périodiques/Neue Zeitschifte

Journal of Potassium Research. Quarterly. Potash Research Institute of India, Gurgaon. G. S. Sekhon, chief editor; A. B. Ghosh, editor. ISSN 0257-4993.

This new quarterly deals with all aspects of potassium research related to agriculture. It accepts full length research papers or short communications and also publishes invited review articles and book reviews. *Subscription price:* US\$ 10.00 per volume, including airmail charges.

Orders to: Potash Research Institute of India, Sector 19, Dundaheera, Gurgaon-122 001, Haryana, India.

Applied Agricultural Research. 5 issues per year.

J. Oster, editor-in-chief. Springer Verlag, New York, Boston.

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Geomorphology. Quarterly. M. Morisawa, editor. Elsevier Science Publishers, Amsterdam, New York. ISSN 0169-555X.

This new geomorphological journal will publish review articles, research papers, book reviews and letters related to pure and applied geomorphology. The scope of the journal will include such topics as: modelling of landforms, landform studies on all scales, extra-terrestrial landforms, geomorphological processes, applied geomorphology, tectonic geomorphology and climatological geomorphology.

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IIMI Management Brief. The International Irrigation Management Institute, Digana Village, Sri Lanka.

This new series, which started with issue no. 1 in July 1986, consists of information sheets giving information on management aspects of irrigation *sensu largo*. IIMI is an autonomous international organization conducting research, providing opportunities for professional development and communicating information about irrigation management.

Requests to: Communications and Publications Office, IIMI, Digana Village via Kandy, Sri Lanka.

Journal of Tropical Ecology. Quarterly. Published for Intecol and ICSU Press by Cambridge University Press. A. G. Marshall, editor. ISSN 0266-4674.

There is a growing interest in tropical ecosystems and their proper management. This new quarterly is directed to have a strong educative role. While the great majority of pages will be devoted to the publication of scientific papers, the inclusion of 'Notes' and 'Short Communications' should enable readers to engage in debate at a more informal level. Further, the breadth of coverage and its pricing policy, should make it accessible to young ecologists living in the tropics.

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Water Resources Management. Quarterly. G. Tsakiris, editor. D. Reidel Publishing Comp., Dordrecht. ISSN 0920-4741.

This international Journal is published for the European Committee for Water Resources Management (ECOWARM). The journal is launched with the aim of becoming an international multidisciplinary forum for the presentation of original contributions and exchange of knowledge and experiences on water resources management. It will publish contributions in the following areas: (i) Water resources assessment, development, conservation, and control (with emphasis on the policies and strategies); (ii) Planning and design of water resource systems, and (iii) Operation, maintenance, and administration of water resource systems.

As closely related to the above, the following areas are also of interest: hydrological and technological aspects; water demand and consumption; applied surface and groundwater hydrology; water management techniques; simulation and modelling of water resource systems; forecasting and control of quantity and quality of water; economic and social aspects of water use; legislation and water resources protection.

The Journal is supported scientifically by the European Committee for Water Resources Management, a scientific and technical committee working within the framework of the International Association of Hydrological Sciences (IAHS). Therefore, the Journal is expected to play a major role in achieving the purposes of the committee which are to promote the application of scientific knowledge to practical engineering activities, and enhance European and international cooperation of water resources management.

Subscription price: (1987) Institutional rate: Dfl. 201.00 or US\$ 81.00; private rate: Dfl. 80.00 or US\$ 28.00 including postage.

Orders to: Kluwer Academic Publishers Group, P.O. Box 322, 3300 AH Dordrecht, The Netherlands.

Journal '86. The Annual Report of the World Resources Institute, Washington, 1986, 76 p. ISSN 0883-8100. This issue: ISBN 0-915825-13-9.

This Journal of the World Resources Institute (WRI) is a forum for discussing natural resource issues. Published to help bridge the gap between scholarly research and resource policy, it features new ideas and findings in WRI's six fields of study: the conservation of biological resources, sustainable agriculture, energy and climate, pollution and health, institutions and governance, and resource and environmental information. It also covers environmental diplomacy, sustainable development, and other cross-cutting subjects.

The Journal, published annually, records the progress of the Institute by reporting its principal activities and its cooperative efforts with other organizations. It publishes excerpts from WRI's publications and highlights from the institute's conferences, seminars, and other meetings.

Price: US\$ 7.50, plus \$ 0.50 for postage. Prepayment required.

Orders to: World Resources Institute, Publications, P.O. Box 620, Holmes, Pennsylvania 19043-0620, U.S.A.

MIRCEN, Journal of Applied Microbiology and Biotechnology. A Research Journal for Biotechnology in the Developing World. Oxford University Press in Association with Unesco. J. C. Senez and F. A. Skinner, editors. ISSN 0265-0762.

This new journal is designed to provide an outlet for papers describing the results of original work in applied microbiology and biotechnology, on topics of particular relevance to the needs of the developing world. The editors wish to emphasise that the journal is not restricted to work from the MIRCEN's (Microbiological Resource Centres) and they intend to publish papers, in English or in French, from scientists in the developed as well as the developing countries who are involved in experimental work on the biological and ecological problems of the third world and in the application of recent advances in biotechnology to these problems.

The journal contains research papers of substantial length, short communications and review articles. Communications on the following topics are well-suited to this new journal: all aspects of biological nitrogen fixation with special emphasis on the rhizobium-legume symbiosis in warmer climates, management of culture collections, microbiology of fermented beverages, foods and feeds, microbiology, single-cell proteins, fuel production from biomasses, waste re-cycling and biogas production, pollution control, diseases of tropical food plants, public health and veterinary problems in the tropics.

The MIRCEN journal will be of interest to academics working on the application of microbiological techniques, and to those involved in research in industry. It will also be of value to agriculturalists, food scientists and biologists working in the field.

Subscription price: (1985, vol. 1; 1986, vol 2) U.K.: £ 20.00, U.S.A.: US\$ 45.00; elsewhere £ 25.00.

Orders to: Journals Subscription Dept., Oxford University Press, Walton Street, Oxford OX2 6DP, England.

Environmental Geology and Water Sciences. Bi-monthly. Ph. E. La Moreaux, editor-in-chief. Springer Verlag, New York, Berlin. ISSN 0099-0094.

This international journal is concerned with the interaction between humanity and the earth. Its coverage of topics in the earth sciences is necessarily broad and multidisciplinary. The journal deals with geologic hazards and geologic processes that affect people; management of geologic resources, broadly interpreted as land, water, air, and minerals including fuels; natural and man-made pollutants in the geologic environment; and environmental impact studies. Of special note is the increased contribution of papers in the area of toxic, hazardous and radioactive waste and their impact on the environment.

The journal accepts papers on the environmental and geologic aspects of permitting oil and gas wells, coal and phosphate mines. The journal also assesses the impact of exploration and extraction of other minerals, water, and energy. Reports on original geological research having environmental implications are accepted provided they meet the journal's standards for sound research and data.

As indicated in the title, the journal covers the impact of man's use of water, such as in mining and agriculture. It also reports on the movements and quality of ground water and its source of currents. In general, papers characterized by unusual points of view or treatments of controversial subjects are welcome, provided ample data are presented to support the author's statements.

The frequency of publication has been increased from 4 to 6 issues per year.

Subscription price: (1987) DM 346.00, plus postage.

Orders to: Springer for Science, P.O. Box 503, AM IJmuiden, The Netherlands. For North America: 175 Fifth Avenue, New York, NY 10010, U.S.A.

Applied Geochemistry. Journal of the International Association of Geochemistry and Cosmochemistry. Bi-monthly. B. Hitchon, executive editor. Pergamon Press, Oxford, New York.

This is an international journal devoted to original research papers in geochemistry and cosmochemistry which have some practical application to an aspect of human endeavour, such as the search for resources, their upgrading, preservation of the environment, agriculture and health. Some of the wide range of topics to be covered are: the search for energy resources such as petroleum, natural gas, geothermal energy, oil shales, tar sands and coal, as well as uranium; the search for mineral resources, both metalliferous and non-metalliferous; the upgrading of energy and mineral resources where there is a direct geochemical application e.g. water-rock interaction during in situ recovery of tar sands; the use of geochemical knowledge for the protection of the environment from pollution; medical geochemistry or the association of diseases (human health) with, for example, trace elements in soils and water; and agricultural aspects of geochemistry e.g. association of growth with trace elements in soils and water.

Subscription price:

Orders to: Pergamon Press, Headington Hill Hall, Oxford OX3 0BW, England; or: Maxwell House, Fairview Road, Elmsford, NY 10523, U.S.A.

The Ecologist, incorporating Mazingira. Journal of the Wadebridge Ecological Centre. Editors: E. Goldsmith, N. Hildyard and P. Bunyard. Managing editor: Maria Parsons. Ecosystems Ltd.

Since it has been impossible for UNEP to continue its subsidy to Mazingira, the publishers of this well-known journal have decided to discontinue its publication. The publishers of the Ecologist have agreed to incorporate Mazingira in their magazine.


Subscription price: Institutions £ 27.00 or US\$ 46.00; Personal £ 16.00 or US\$ 28.00; Third world and student rate £ 14.00 or US\$ 22. All prices including postage.

Orders to: The Ecologist, Worthvale Manor, Camelford, Cornwall PL32 9TT, U.K.

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Size: 6 issues per year, in one volume of about 600 pages.
Publisher: Catena Verlag, 3302 Cremlingen 4, Federal Republic of Germany.
Editor-in-Chief: Prof. Dr. H. 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, Bundoorra, Australia.
Full subscription rate, including surface mailing: US\$ 210.00.
Personal subscription price for ISSS members: US\$ 42.00 (80% discount)
3. GEODERMA, an International Journal of Soil Science.
Size: About 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.
Full subscription rate, including surface mailing: Dfl 518.00 (US\$ 178.00)
Personal subscription price for ISSS members: Dfl 170.00 (about US\$ 58.00; 66% discount).
4. BIOLOGY & FERTILITY OF SOILS
Size: Four issues per year, in one volume of about 250 pages.
Publisher: Springer International, IJmuiden, The Netherlands.
Editor-in-Chief: Prof. Dr. J. C. G. Ottow, Hohenheim, Fed. Rep. of Germany.
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