

BULLETIN

OF THE INTERNATIONAL SOCIETY
OF SOIL SCIENCE

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BULLETIN

DE L'ASSOCIATION INTERNATIONALE
DE LA SCIENCE DU SOL

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MITTEILUNGEN

DER INTERNATIONALEN BODENKUNDLICHEN
GESELLSCHAFT

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

Office/Bureau: c/o Royal Tropical Institute, 63 Mauritskade, Amsterdam, Netherlands.

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- I — SOIL PHYSICS.
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Chairman: R. Dudal, World Soil Resources Office, F.A.O., Via delle Terme Caracalla, Roma, Italy.
- VI — SOIL TECHNOLOGY.
Chairman: T. J. Marshall, C.S.I.R.O., Division of Soils, Private Mail Bag 1, Glen Osmond, S.A., Australia.
- VII — SOIL MINERALOGY.
Chairman: K. Norrish, C.S.I.R.O., Division of Soils, Private Mail Bag 1, Glen Osmond, S.A., Australia.

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No. 37

1970

ISSS — INQUA — UNESCO SYMPOSIUM

on

The age of parent materials and soils
Amsterdam, Netherlands, 10—15 August, 1970.

Participants from Argentine, Australia, Belgium, Bulgaria, Canada, Czechoslovakia, Denmark, France, German Federal Republic, Hungary, Iraq, Ireland, Israël, Italy, Malaysia, Netherlands, New Zealand, Senegal, Spain, Tunisia, United Kingdom, U.S.A., U.S.S.R. and Venezuela assembled in the Institute of Geography and Soil Science of the Amsterdam University on August 10th, 1970 to assist at the symposium on the Age of Parent Materials and Soils. ISSS was officially represented by Vice-President Academician Gerasimov (U.S.S.R.), INQUA by President Dr Mitchell (U.K.) and UNESCO by Dr. Lange. Dr. Van Baren (ISSS), who had convened the meeting on behalf of UNESCO and INQUA, opened the session as the responsible organizer with words of welcome to the 70 participants, expressing thanks to Prof. Ruhe and Dr Yaalon of the Commission on Paleosols of INQUA for their active support in preparing the programme. Six invited speakers presented a contribution on the following subjects:

- Monday the 10th, A.M. Academician I.P. Gerasimov: Nature and Origin of Paleosols.
- Tuesday, 11th, A.M. Dr R. V. Ruhe: Paleosols, Loess Sedimentation, and Soil Stratigraphy.
- P.M. Dr A. Ruellan: Quelques réflexions sur la paléo-pédologie.
- Wednesday, 12th, A.M. Dr J. B. Dalrymple: Some problems associated with the nature of paleosols and paleo-landsurfaces.
- P.M. Dr D. H. Yaalon: a) Soil forming processes in time and space; b) Report of Working Group on the Nature and Origin of Paleosols.
- Thursday, 13th, A.M. Mr H. S. Gibbs: Nature and Origin of Paleosols.

Thirty-seven supporting papers dealt with the various characteristics of paleosols viz. their macro-morphology as related to the morphological history of the landscape, the difficulties encountered in determining their age by carbonate and soil organic matter dating, and the value of micro-morphological study for the recognition of paleosolic features in present day soils.

Receptions by the Board of the Royal Tropical Institute and by the Mayor of Amsterdam were highly appreciated breaks in the rather heavy scientific programme. An excursion on Friday, August 14th to South Limburg, perfectly organized by Dr Schelling, Van den Broek and De Bakker of the Soil Survey Institute at Wageningen, offered the opportunity to discuss paleosolic problems in

the field at well-chosen profiles. It formed a most satisfactory closing of an interesting symposium which learned that Paleopedology is only just at the beginning of a development, however with very promising possibilities for providing more and more data that will contribute to a better understanding of present day soil genesis as influenced by inherited impacts of climate and rock.

F. A. van Baren.

SYMPOSIUM AISS — INQUA — UNESCO

sur

L'âge des matériels parentaux et des sols Amsterdam, Pays-Bas, 10—15 août 1970

Des participants venus d'Argentine, d'Australie, de Belgique, de Bulgarie, du Canada, du Danemark, d'Espagne, de France, de Hongrie, d'Iraq, d'Irlande, d'Israël, d'Italie, de Malaisie, de Nouvelle Zélande, des Pays-Bas, de la République Fédérale Allemande, du Royaume-Uni, du Sénégal, de Tchécoslovaquie, de Tunisie, des U.S.A., d'U.R.S.S. et du Vénézuéla se sont réunis à l'Institut de Géographie et de Science du Sol de l'Université d'Amsterdam le 10 août 1970 pour assister au Symposium sur l'Age des Matériels Parentaux et des Sols. L'AISS était officiellement représentée par son Vice-Président l'Académicien Gerasimov (URSS), l'INQUA par son Président le Dr Mitchell (Royaume-Uni) et l'UNESCO par le Dr Lange. En tant qu'organisateur principal, le Dr van Baren (AISS) qui avait convoqué cette assemblée au nom de l'UNESCO et de l'INQUA, a ouvert la session par des mots de bienvenue aux 70 participants, remerciant le Professeur RUHE et le Dr YAALON de la Commission des Paléosols de l'INQUA pour leur soutien actif lors de la préparation du Programme. Six orateurs invités ont présenté leur contribution sur les sujets suivants:

- | | | |
|---------------|------------|--|
| Lundi, 10, | avant-midi | Académicien I. P. Gerasimov: Nature and Origin of Paleosols. |
| Mardi, 11, | avant-midi | Dr R. V. Ruhe: Paleosols, Loess Sedimentation, and Soil Stratigraphy. |
| | après-midi | Dr A. Ruellan: Quelques réflexions sur la paléopédologie. |
| Mercredi, 12, | avant-midi | Dr J. B. Dalrymple: Some problems associated with the nature of paleosols and paleo-landsurfaces. |
| | après-midi | Dr. D. H. Yaalon: a) Soil forming processes in time and space. b) Report of Working group on the Nature and Origin of Paleosols. |
| Jeudi, 13, | avant-midi | Mr H. S. Gibbs: Nature and Origin of Paleosols. |

Trente-sept communications furent présentées concernant les différentes caractéristiques des paléosols, telles que leur macromorphologie reliée à l'histoire morphologique du relief, les différences rencontrées dans la détermination de leur âge par datation des carbonates et de la matière organique, et la valeur de l'étude micromorphologique pour la reconnaissance des caractères paléosoliques des sols actuels.

Des réceptions organisées par la Direction de l'Institut Royal Tropical et par le Bourgmestre de la ville d'Amsterdam constituèrent des diversions hautement appréciées dans un programme d'un niveau scientifique particulièrement élevé. Une excursion le vendredi 14 août dans le Sud du Limbourg, parfaitement organisée par les Drs Schelling, Van der Broek et De Bakker de l'Institut de Cartographie des Sols de Wageningen, permit de discuter sur le terrain des problèmes des paléosols en présence de profils judicieusement choisis. Elle fut la conclusion d'un symposium intéressant qui confirma que la paléopédologie en est encore à ses débuts avec cependant des possibilités très prometteuses et l'espoir que des informations de plus en plus nombreuses contribueront à une meilleure compréhension de la genèse des sols actuels qui est causée par les influences héritées du climat et de la roche.



*Participants in the ISSS/INQUA/UNESCO
Symposium on Paleosols Amsterdam 10—15 August, 1970*

ISSS — INQUA — UNESCO SYMPOSIUM

über

„Das Alter von Ausgangssubstraten und Böden“ Amsterdam, Niederlande, 10.—15. August 1970

Am 10. August 1970 versammelten sich im Institut für Geographie und Bodenkunde der Universität Amsterdam Teilnehmer aus Argentinien, Australien, Belgien, Bulgarien, Kanada, Tschechoslowakei, Dänemark, Frankreich, Bundesrepublik Deutschland, Ungarn, Irak, Irland, Israel, Italien, Malaysia, Niederlande, Neuseeland, Senegal, Spanien, Tunesien, England, U.S.A., U.d.S.S.R. und Venezuela, um sich an dem Symposium über „Das Alter von Ausgangssubstraten und Böden“ zu beteiligen.

Die ISSS war offiziell vertreten vom Vize-Präsidenten und Akademie-Mitglied Gerasimov (U.d.S.S.R.), die INQUA vom Präsidenten Dr. Mitchell (England) und die UNESCO von Dr. Lange. Herr Prof. van Baren (ISSS), der im Namen der UNESCO und der INQUA die Versammlung einberufen hat, eröffnete die Sitzung als verantwortlicher Veranstalter mit Begrüßungsworten an die 70 Teilnehmer und dankte Herrn Prof. Ruhe und Herrn Dr. Yaalon von der Kommission für Paläosole der INQUA für ihre aktive Unterstützung bei der Vorbereitung des Programms. Sechs eingeladene Redner hielten Vorträge über folgende Themen:

- | | | |
|------------------------|--------------|--|
| Montag, der 10.8., | vormittags: | Akademie-Mitglied I. P. Gerasimov: „Wesen und Entstehung der Paläosole“. |
| Dienstag, der 11.8., | vormittags: | Dr. R. V. Ruhe: „Paläosole, Löß-Sedimentation und Bodenstratigraphie“. |
| | nachmittags: | Dr. A. Ruellan: „Einige Betrachtungen über die Paläopedologie“. |
| Mittwoch, der 12.8., | vormittags: | Dr. J. B. Dalrymple: „Einige mit dem Wesen der Paläosole und Paläo-Landoberflächen verbundenen Probleme“. |
| | nachmittags: | Dr. D. H. Yaalon: a) „Bodenbildende Prozesse in Zeit und Raum; b) „Bericht der Arbeitsgruppe über Wesen und Entstehung der Paläosole“. |
| Donnerstag, der 13.8., | vormittags: | Herr H. S. Gibbs: „Wesen und Entstehung der Paläosole“. |

37 weitere Beiträge behandelten die verschiedenen Eigenschaften der Paläoböden, nämlich ihre Makro-Morphologie in Bezug auf die geomorphologische Landschaftsentwicklung, die auftretenden Schwierigkeiten bei der Altersbestimmung der Carbonate und der organischen Bodensubstanz sowie den Wert der mikromorphologischen Untersuchung bei der Feststellung paläopedologischer Merkmale in rezenten Böden.

Empfänge am Königlichen Tropischen Institut und beim Bürgermeister von Amsterdam waren sehr willkommene Unterbrechungen bei dem ziemlich intensiven wissenschaftlichen Programm. Eine von den Herren Dr Schelling, Van der Broek und De Bakker vom „Soil Survey Institute“, Wageningen, ausgezeichnet organisierte Exkursion am Freitag, dem 14. August, nach Süd-Limburg gab Gelegenheit zur Diskussion über Probleme der Paläosole im Feld an gut ausgesuchten Profilen. Die Exkursion stellte einen zufriedenstellenden Abschluß eines interessanten Symposiums dar, das gezeigt hat, daß die Paläopedologie gerade im ersten Entwicklungsstadium ist, jedoch vielversprechende Möglichkeiten für die Tatsachen erkennen läßt, die zu einem besseren Verständnis des gegenwärtigen Stadiums der Bodengenese, beeinflußt von Klima und Gestein, beitragen.



*The paleosol-tour to South Limburg
This exposure surely must be worth
to be eternized!*

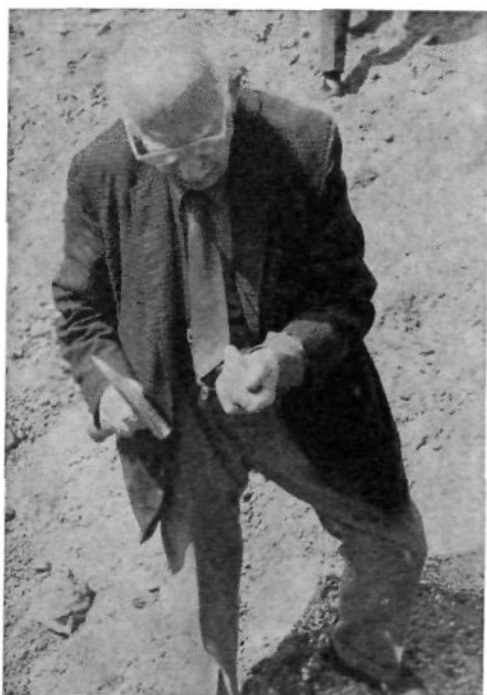
*Tourleader Van den Broek explains
the history of a paleosol profile of
miocene age in South Limburg
(Netherlands).*



The paleosol-tour to South Limburg.



*There are those who reflect
(Dr. Dalrymple, U.K.)
and those who act
(Hon. Member Professor Kubiěna).*



INQUA COMMISSION ON PALEOPEDOLOGY

Working Group on the Origin and Nature of Paleosols

A paleosol is by definition a soil which has formed in a landscape of the past. The objectives of the Working Group on the Origin and Nature of Paleosols, one of three established by the Commission on Paleopedology at the 8th Congress of the International Union for Quaternary Research (INQUA) in Paris, September 1969, are:

1. To encourage detailed studies of paleosols, their origin and subsequent transformations;
2. To establish criteria for recognizing and describing paleosols;
3. To suggest a suitable classification for paleosols and paleosolic features;
4. To encourage the utilization of paleosols in Quaternary studies.

To promote these objectives a circular was sent out by the chairman, D. H. Yaalon (Hebrew University, Jerusalem), to interested scientists requesting them to list the criteria used by them and their colleagues for the recognition of paleosols and for the description of the paleosolic features and paleosols, and to list the system of classification of paleosols used in the respective countries, with suggestions for its improvement.

On the basis of over 30 answers received, a summary was prepared and distributed as the Third Circular, which represents quite well the present state of art in recognizing and classifying paleosols.

The conclusions were then discussed and amended at the meeting of the Working Group at the Symposium on the Age of Parent Materials and Soils, Amsterdam, August 1970, and are listed below.

Conclusions of the Working Group on the Origin and Nature of Paleosols (amended in Amsterdam, August 1970)

1. Paleosols must be studied by the same methods as present day soils. Their characteristics should be related to similar features or processes in modern soils.
2. The field recognition of more than one distinct pedogenic feature forms the basis for the recognition of a paleosol.
3. Pedologic nomenclature and horizon connotations should be used in describing all observed features and horizons. These can be supplemented by specific connotations to indicate the paleosolic nature of the feature.
4. Both partial and complete profiles should be traced laterally in the landscape to determine their spatial variation.
5. A variety of laboratory methods provides good and often quantitative evidence of paleopedogenesis, and should be applied in combination with the field identification.
6. A paleosols nomenclature with a pedologic connotation is most desirable, and should be based on accurately and objectively described properties.
7. A generally used, national or international, soil classification system is favoured also for paleosols, as it relates the paleofeatures to present day analogues. The degree of the observed diagenetic alteration should be noted in a qualifying term, whenever applicable.

8. A classification at the Great Soil Group level or similar levels is most useful for interpretation and comparative purposes.
9. Studies are needed on the preservation of pedologic features and on their possible alteration under various environmental conditions, both on buried and non-buried surfaces.

It must be stressed that these discussions and conclusions cover only part of the whole field of paleopedology. In particular the various methods of dating paleosols and the stratigraphical aspects are dealt with by other working groups.

The Working Group plans to hold its next meeting during the INQUA Congress in New Zealand.

Dan H. Yaalon
Department of Geology and Pedology
The Hebrew University of Jerusalem

Jerusalem, September 1970

COMMISSION III

International News Bulletin SOIL BIOLOGY.

Over the past years SOIL BIOLOGY, edited by Dr. Tardieux (Microbiology) and Dr. d'Aguilar (Zoology) on behalf of Commission III of the ISSS has been distributed free-of-charge to interested specialists. The publishing of this periodical could be implemented thanks to a subvention of UNESCO. This UN-agency informed the editors that the financial support was meant to give the bulletin a good start but that the future costs could no longer be borne by UNESCO.

This irrevocable decision has as a consequence that as from January 1st, 1971, there can be no more free distribution. Therefore, starting 1971, a subscription fee must be paid as otherwise the publication of SOIL BIOLOGY cannot be continued. This indeed would be a very disappointing result of the effort to dissipate the latest information on Soil Biology on an international scale. In fact, from reactions received from a number of specialized readers (about 500) it could be concluded that the bulletin met a scientific need and that discontinuation of the edition would leave a deplorable gap in communication in the sphere of Commission III.

In view of the facts outlined anyone interested is urgently requested to fill out the slip below, indicating a binding commitment to pay the very low subscription fee of 5 U.S. dollars thus assuring the publication of SOIL BIOLOGY in the coming years. As it depends on the number of inscriptions whether the edition can be continued, an early reply is solicited.

F. A. van Baren
Secretary-General of the ISSS

To the Secretary-General of the ISSS
c/o Royal Tropical Institute
63 Mauritskade
AMSTERDAM, NETHERLANDS

The undersigned

name & title

institute

address

subscribes to the International News Bulletin SOIL BIOLOGY at the price of 5 U.S. Dollars, or equivalent in convertible national currency, or in Unesco Book-coupons.

Date Signature

COMMISSION V

Working Group on Soil Micromorphology

In Bulletin 35 of the International Society of Soil Science the establishment of an unofficial working group on soil micromorphology was announced. Since this date the working group has obtained official recognition from ISSS and some financial support from UNESCO. It is charged with drafting a *First approximation of a new classification and terminology of soil micromorphological features and units.*

The first meeting of the group was convened by the Netherlands Soil Survey in Wageningen, Holland. At that occasion attention was focussed on such fundamental concepts as *skeleton, plasma, fabric, structure and texture* as well as the *classification of neoformations and relict formations* in soils, and all this from scientific, historical and linguistic points of view. The meeting concluded that there is no generally acceptable system of classification and terminology and that a great number of the features observed in soil micromorphology are not completely covered by existing terms derived from geology, petrology and related earth sciences. The members of the group felt that they are still very much in the "collecting stage" with respect to information about many units. Although the report of this meeting suggests future subjects for discussion related to the aspects mentioned, it was realized that there were other topics which should be brought up as soon as possible: (I) *weathering and neoformations*, (II) *biological features*, (III) *porosity*, (IV) *higher levels of organisation*, etc.

It was decided to compile a glossary of existing terms translated into and explained in the official languages of FAO/UNESCO (English, French, German, Russian and Spanish). Every member of the group will try to trace in his own country or linguistic field the origin of terms, their original meaning and changes. It is expected that this first draft will be ready before the 4th International Working Meeting in 1973.

An official report of the achievement of the working group resulting from the first four meetings must be prepared by 1st November 1971. The group welcomes advice from all colleagues interested in the above topics and requests them to contact its secretary, Dr. A. Jongerius.

I wish to be placed on the mailing list of the International Working Group on Soil Micromorphology and receive its reports and notices.

Address

Name

Institution

My particular interest in this field is

I would/would not be interested in providing the working group with information.

To be mailed to:

Dr. A. Jongerius

Soil Survey Institute

P.O. Box 98, Wageningen, Netherlands.

NEWS OF THE COMMISSIONS

Joint meeting of Commissions V and VI

Pseudogleys and Gleys — Development and Use of Hydromorphic Soils Stuttgart-Hohenheim, W. Germany, September 1971

Informations re this meeting have been communicated in Nos. 35 and 36 of the Bulletin, and in the circular letter sent last spring. The members who forwarded the Notice of Intent to the Organizing Committee were notified of further pertinent details.

Contributors of scientific papers and participants have to observe the following final dates:

- Nov. 1st, 1970 — Receipt of abstracts of papers.
- Jan. 1st, 1971 — Formal inscription to participate in the meeting (registration fee DM 100.—) and in the excursions.
- May 1st, 1971 — Receipt of text of papers.

Any further questions are to be addressed to:

Organizing Committee of the Symposium on Gley Soils, Department of Soil Science, University of Hohenheim 7000 Stuttgart-Hohenheim, F.R.G.

NOUVELLES DES COMMISSIONS

Réunion conjointe des Commissions V et VI

Pseudogleys et gleys — Genèse et utilisation des sols hydromorphes Stuttgart-Hohenheim, Allemagne de l'Ouest, Septembre 1971

Des renseignements sur cette réunion ont été donnés dans les numéros 35 et 36 du Bulletin et dans la lettre circulaire distribuée au printemps dernier. Les membres qui ont envoyé la notice de participation au Comité Organisateur ont reçu des détails complémentaires.

Les auteurs de communications et les participants sont priés de tenir compte des dates suivantes:

- Nov. 1, 1970 — Réception des résumés des communications.
- Jan. 1, 1971 — Inscription formelle de participer dans la réunion (frais d'inscription DM 100.—) et dans les excursions.
- Mai 1, 1971 — Réception du texte des communications.

Pour toute demande d'information, prière de s'adresser au:

Comité Organisateur du Symposium sur Gleys, Département de Pédologie, Université de Hohenheim 7000 Stuttgart-Hohenheim, Allemagne de l'Ouest.

NEUES DER KOMMISSIONEN

Gemeinsame Konferenz der Kommissionen V und VI Pseudogleys und Gleys - Entstehung und Nutzung hydromorpher Böden Stuttgart- Hohenheim, W. Deutschland, September 1971

Informationen wurden in den Bulletins No. 35 und 36 sowie im IBG-Rundschreiben Frühjahr 1970 gegeben. Die angemeldeten Teilnehmer wurden inzwischen durch ein Rundschreiben über weitere Einzelheiten unterrichtet.

Termine sind:

- 1.11.1970 — Einreichen der Kurzfassungen der Vorträge.
- 1. 1.1971 — Endgültige Anmeldung zu Tagung (Gebühr - 100 DM) und Exkursionen.
- 1. 5. 1971 — Einreichen der Manuskripte.

**Auskünfte erteilt das Organisationskomitee
Abteilung Bodenkunde, Universität Hohenheim, 7000 Stuttgart-
Hohenheim, BRD.**

NEWS OF THE NATIONAL SOCIETIES
NOUVELLES DES ASSOCIATIONS NATIONALES
NEUES AUS GESELLSCHAFTEN DER EINZELNEN LANDERN

Asociacion Argentina de la Ciencia del Suelo

The Argentine Society of Soil Science organizes a meeting of the Committee on the Classification, Genesis and Cartography of Soils on December 3 and 4, 1970 in Buenos Aires.

The theme is: The establishment of a national system of classification, mapping and interpretation of soils.

The proposals to be considered have been elaborated by a committee composed of Agr. Ings, Ricardo Lores, Ramón Zuccardi, Carlos Myaczynski and Dr. Pedro Etchevehere. Members of the I.S.S.S. interested in the results of the deliberations are requested to contact the President of the committee: Ing. Agr. Ricardo Lores, Cerviño 3101, Buenos Aires, Argentina.

Australian Society of Soil Science

For the period 1970—1972 the officers of the Australian Society of Soil Science are as follows:

President	— Mr. J. K. M. Skene
Vice-President	— Dr. C. H. Williams
Secretary	— Dr. G. P. Briner
Treasurer	— Dr. N. C. Uren.

The office of the Society for the period will be:

Australian Society of Soil Science
C/-Agricultural Chemistry Laboratory
5 Parliament Place, Melbourne, 3002, Australia.

Sociedad Colombiana de la Ciencia del Suelo

In the first Colloquium held last July by the Soil Science Society of Colombia, the following Board was elected:

President	: A. Leon
Vice-President	: J. Navas
Secretary	: V. Romero
Treasurer	: F. Silva
Members	: E. de Roza, O. Ospina, H. Manzano, J. Spain, H. Chaverra and A. Del Valle.

Society of the Science of Soil & Manure, Japan.

The Society of the Science of Soil and Manure, Japan, held its annual meeting from April 2 to 5, 1970 in Tokyo. No less than 280 papers were presented and some 1000 persons attended the meeting.

The following executive members were elected for the period April 1970 to March 1972:

President	— Prof. Dr. Keizaburo KAWAGUCHI, Kyoto University, Kyoto
Vice-President	— Dr. Noboru MURAYAMA, Nat. Inst. of Agri. Sciences, Tokyo
Vice-President	— Mr. Naotaka SAGA, Tokyo Fertilizer Inspection Office, Tokyo
Secretary-General	— Dr. Minoru YOSHINO, Nat. Inst. of Agri. Sciences, Tokyo.

The Society of Soil Science of South Africa

The S.S. of S.A. held its 3rd Congress at Bloemfontein from 31st March to 3rd April 1970. The thirty papers presented can be classified as follows:

Commission	I. Soil Physics	5 papers
	II. Soil Chemistry	9 papers
	III. Soil Biology	—
	IV. Soil Fertility	8 papers
	V. Soil Genesis, Class. and Cartography	5 papers
	VI. Soil Technology	2 papers
	VII. Soil Mineralogy	1 paper

Six of the attending members came from neighbouring countries such as Mocambique, Lesotho, Swaziland and Rhodesia.

A new committee was elected with Prof. E. R. Orchard as President.

Sociedad Venezolana de la Ciencia del Suelo

The Venezuelan Society of Soil Science elected as Members of its Board:

President	—	Ing. Agr. Luis Bascones
Vice-President	—	Ing. Agr. Richard Schargel
Secretary-General	—	Dr. Ildefonso Pla
Treasurer	—	Ing. Agr. Pedro Brito
Member	—	Ing. Agr. Luis Arias.

It is planned that the 1st Venezuelan Congress of Soil Science will be held in Maracaibo from November 8th to 14th, 1970. The Organizing Committee is composed by:

President	—	Ing. Agr. Luis J. Medina
Vice-President	—	Ing. Agr. Luis Bascones
Vice-President	—	Ing. Agr. Luis Segnini
Vice-President	—	Ing. Agr. Oswaldo Hernández L.
Executive Secretary	—	Ing. Agr. Luis Arias.

Further information is to be obtained from the

Sociedad Venezolana de la Ciencia del Suelo
Instituto de Edafología, Facultad de Agronomía
Maracay, Venezuela.

MISCELLANEOUS NEWS — INFORMATIONS DIVERSES VERMISCHTE MITTEILUNGEN

The International Soil Museum

Slow but steady progress is made in building up an international collection of soil monoliths. Profiles have been collected by the scientific crew of ISM in Southern Spain representing a range of Mediterranean soils, viz. red loams, rendzina on gypsum, entosols on granite, schists a.o., calcic xerorthents, and vertisols, whereas our Slovakian colleagues assisted in assembling seven profiles from Eastern Czechoslovakia. These profiles show examples of orthic chernozems, de-graded chernozems, chernitza and sodic soils.

In order to promote further collaboration of soil survey specialists in other European countries, the Hon. Director of ISM visited the Soil Research Institutes in Belgrad (Yugoslavia), Sofia (Bulgaria), Ankara (Turkey) and Thessaloniki (Greece) in September 1970. A collecting programme is now being elaborated for execution in 1971 by our colleagues in the countries mentioned.

It is a pleasure to acknowledge great appreciation for the interest shown in this world-wide project, and for the fine spirit of co-operation and understanding encountered during this trip.

F. A. van Baren.

Organic matter in fractions separated from various Ah horizons

Preliminary studies have been initiated in an attempt to characterize the differences, if any, in the nature of the organic matter and the association between organic and inorganic constituents in the Ah horizons of some Chernozemic, Luvisolic and Gleysolic soils. Suspensions of the samples in water were treated with an ultrasonic probe for 15 minutes, sieved to remove the sand (50μ) and separated by sedimentation into 50-20, 20-5, 5-2, 2-.2 and $<.2$ micron fractions. The sand was separated into less than 2 and greater than 2 specific gravity fractions. Extractable C (pyrophosphate — NaOH), humic and fulvic acid C, total C + N were determined in the fractions.

The light (< 2 SG) fraction on the sand contained between 20 and 35 % of the total C in the samples, but no relationship was evident between the percentage of this fraction and the class of soil. The 2-5 micron fraction commonly contained almost as much C as the < 2 or the $<.2$ micron fractions. This could be partly due to the fact that ultrasonic treatment did not completely disperse many of the samples. However the 2-5 micron fraction was mainly silt. Humic-fulvic acid ratios did not differ consistently among different size fractions of a sample. However, humic-fulvic ratios were generally higher for Chernozemic Ah horizons and for Ah horizons of Humic Gleysols from the prairies than for Ah horizons of Luvisolic and Gleysolic soils from Ontario. The C/N ratios of the clay fraction were usually somewhat lower than those of the coarser fractions.

To date, this study has not revealed a sound basis of differentiation among the various kinds of Ah horizons occurring in Canada. Possibly the most interesting aspect of the results at present is the high content of organic matter associated with 2-5 and 5-20 micron fractions of some soils. The nature of the association between the organic and inorganic constituents is not known.

Suggestions or comments of others interested in this area of work would be appreciated.

J. A. McKeague

Soil Research Institute, Ottawa, Canada.

Shallow Drains for Reclamation of a Saline-Sodic Soil

Drainage plots were established at Vauxhall in 1968 to determine the relative performance of 4-inch clay tile and 2½-inch perforated corrugated flexible plastic tubing. The soil was a clay loam with coarse sand overlaying sandy loam with clay lenses. The drains were placed 4 feet deep and 82 feet apart. The cost of the tile

and tubing was 17 and 13.4 cents a foot, respectively. During the 1969 irrigation season over 24 inches of irrigation water was applied and 5.9 inches of rainfall fell. Throughout the season, drain discharges were determined, and drain water and soil samples were collected.

Only 50 % of the water applied can be accounted for in the drain discharge. The performance of the plastic tubing was as good as or better than that of the clay tile. Salt removal, as indicated from EC_s data, was apparent (see table); the greatest reductions were in the surface 6 inches. The exchangeable sodium, as indicated by the SAR data, also decreased (see table); the greatest reductions were in the surface 6 inches. Salt removal through the drains varied with the volume of water discharged. Salt and water losses through deep percolation were evident.

Drain material	No.	EC _s mean to 2 feet			SAR mean to 2 feet			Salt removed through drains (tons/acre)
		April 15	Oct. 2	Diff.	April 15	Oct. 2	Diff.	
Plastic	1	6.1	5.0	1.1	8.9	7.5	1.4	6.0
Tile	1	6.1	4.2	1.9	7.5	4.4	3.1	5.2
Plastic	2	5.7	4.5	1.2	5.9	3.1	2.8	3.6
Plastic	3	6.1	4.5	1.6	6.3	3.1	3.2	4.1
Plastic	4	6.0	3.6	2.4	6.5	2.7	3.8	3.0
Tile	2	4.8	1.6	3.2	7.0	4.6	2.4	0.4
Plastic	5	4.7	2.2	2.5	8.2	8.2	0.0	1.2
Plastic	6	4.5	2.5	2.0	7.1	4.9	2.2	2.3

Theron G. Sommerfeldt
Research Station, Lethbridge, Canada.

From this study, it appears feasible to reclaim salinized soils with shallow drainage and leaching. Because the water table is so near the surface resalinization is anticipated unless proper management practices are adhered to, viz. an occasional leaching of the accumulated salts from the soil and management practices that will retard resalinization. Plastic tubing is cheaper than clay tile, it is easier to install and appears to perform equally well with clay tile. Other studies are in progress to further evaluate the relative performance of various subsurface drain materials and designs.

Reprinted from "Soil Horizons", vol. II, No. 2, 1970
Publ. Research Branch, Canada
Department of Agriculture.

**12th Pacific Science Congress
Canberra, Australia, 18th Aug.—3rd Sept., 1971.**

The general topics of the Congress are:

- A — Productivity and Conservation in the Pacific
- B — Man in the Pacific
- C — Environmental Quality and Resource Management: Political, Legal and Administrative Realities
- D — Geological Structure and Mineral Resources in the Pacific Area.

The first day of this Congress is devoted to a Symposium on: Problems and production potentials on certain soils in the Pacific region. Past-President of ISSS, Dr E. G. Hallsworth, is in the chair.

Topics are:

- i. The recent volcanic soils (restricting consideration to soils formed on volcanic material younger than 20,000 years).
- ii. The limestone derived soils — with particular reference to soils formed on coral.

- iii. The Cat clays.
iv. The recent alluvial coastal soils (restricting consideration to soils formed on material younger than 20.000 years).

For further information apply to:

**The Organizing Secretary
Twelfth Pacific Science Congress
Australian University of Science
Gordon St., Canberra City, A.C.T., Australia, 2601.**

International Award in Tobacco Science

Tobacco being very susceptible to quality of soil and nature of fertilizers, the domain of Commission IV, it was felt justified to insert the following news item.

Coresta announces establishment of Philip Morris International Award in Tobacco Science

HAMBURG, Germany — The establishment by Philip Morris International of a special award for distinguished achievement in tobacco science was announced by Mr. Jean Sadrin, president of CORESTA and managing director of S.E.I.T.A., France, on September 19 at the Research Organizations 1970 General Assembly in Hamburg, Germany.

The award, to be called The Philip Morris International Award in Tobacco Science, will be granted at intervals of not less than two years and will consist of a specially designed medallion, a certificate and an honorarium of U.S. \$2,000. The first award will be given at CORESTA's next General Assembly in 1972. Mr. Sadrin stated that research achievements of scientists from all nations of the world will be considered, and that the recipient will be selected by a specially created CORESTA Awards Committee.

Mr Sadrin further explained that the new award will be given for distinguished achievement in either basic or applied science, including such areas of interest as:

- Scientific achievement in the development of fundamental knowledge related to the growth, harvesting and curing of tobacco
- Scientific achievement in the development of fundamental knowledge concerning the properties and qualities of tobacco and tobacco products
- Scientific achievement in the development of methods for the evaluation of the properties of tobacco and tobacco products.

Dr. Helmut Wakeham, a member of CORESTA's Scientific Commission and vice president, corporate research and development of Philip Morris Incorporated, joined Mr. Sadrin in making the announcement and stated that "the purpose of the award is to encourage tobacco scientists to work continuously toward developing an ever-growing store of fundamental tobacco science knowledge."

"Expanded research activities will benefit all segments of the tobacco industry", Dr. Wakeham said. "Growers, producers, warehousemen, even retailers, will gain from the advanced methods and knowledge that will invariably result from increased study in basic tobacco science. Consumers will also gain from the work we hope to stimulate, since new and improved products are always the result of a scientifically dynamic industry."

Information regarding nominating procedures will be announced by CORESTA in the near future.

Association Internationale de Cybernétique

Le VI^e Congrès International de Cybernétique, organisé à Namur (Belgique) du 7 au 11 septembre 1970, par l'Association Internationale de Cybernétique a connu un important succès. 175 conférences et communications figurent à son programme. Leurs auteurs appartiennent à l'élite scientifique de 31 pays.

Ce succès est la consécration de l'effort déployé par l'Association depuis sa fondation en 1956, en vue de répandre la pensée cybernétique.

L'Association Internationale de Cybernétique a publié les Actes des cinq congrès précédents: 1956, 1958, 1961, 1964 et 1967. Elle édite depuis 1958 une revue trimestrielle: *Cybernetica*.

Les résumés des communications du VI^e Congrès sont dès à présent disponibles. Ils peuvent être fournis moyennant le paiement d'une somme de 500 francs belges (10 dollars U.S.A.). La souscription aux Actes du VI^e Congrès est ouverte. Le prix de souscription est de 1.800 francs belges (36 dollars U.S.A.) pour autant qu'il soit acquitté avant le 31 décembre 1970. La sortie de presse est prévue pour janvier 1972. Il s'agira d'un ouvrage dont le contenu a une qualité exceptionnelle. Toute commande passée après le 31 décembre 1970 sera enregistrée au prix de 2.500 francs belges (50 dollars U.S.A.).

Il est rappelé que l'Association Internationale de Cybernétique est ouverte à tous ceux qui s'intéressent au développement et aux applications de la Cybernétique. En y adhérant, ils participent à un courant de pensée qui s'inscrit dans la perspective de la science moderne. La cotisation annuelle est modique: 200 francs belges (4 dollars U.S.A.) pour les membres individuels — 1.000 francs belges (20 dollars U.S.A.) pour les firmes et institutions. La qualité de membre donne droit à d'importantes réductions sur le coût des publications.

Ceux qui souhaitent devenir membres de l'Association Internationale de Cybernétique, se procurer les résumés des communications du VI^e Congrès, souscrire aux Actes de ce VI^e Congrès, ou se procurer les publications antérieures, sont priés de s'adresser au siège de l'Association Internationale de Cybernétique, Palais des Expositions, Place André Ryckmans, B - 5000 Namur (Belgique).

Honours to Secretary General

In its General Meeting of August 12th, 1970 the Lenin Academy of Agricultural Sciences of the USSR elected Dr. F. A. van Baren as foreign member.

**INTERNATIONAL CONFERENCES OF ALLIED SCIENCES
CONGRES INTERNATIONAUX DE SCIENCES CONNEXES
INTERNATIONALE KONGRESSE VON VERWANDTEN WISSENSCHAFTEN**

International Symposium on Ground-Water

The Ente di Sviluppo Agricola in Sicilia organizes an International Symposium on Ground-Water from 6—8 December, 1970 in Hotel Villa Igica, Palermo. For further information apply to:

Dr. Aurelio, Secretary of the Conference
c/o E.S.A., Via Libertà n. 201/bis, 90143 Palermo, Sicilia

International Association for the Study of Clays

The A.I.P.E.A. (Association Internationale pour l'Etude des Argiles) will hold its next International Clay Conference in Madrid, Spain, as from 25 to 30 June 1972. The following sections are planned:

1. Crystalchemistry of clay minerals (structures included).
2. Clay minerals genesis and synthesis
3. Colloidal properties of clays
4. Surface chemistry of clays (including catalytic properties)
5. Volume absorption phenomena (organic compound included)
6. Technical properties and applications of clays and clay minerals
7. General papers.

For further information please apply at the very earliest convenience to:

Prof. Dr. J. L. Martín Vivaldi
Secretary-General, International Clay Conference
Departamento de Cristalografía y Mineralogía
Facultad de Ciencias. Sección de Geología
Madrid-3, Spain.

Symposium on Soil Biology and the Optimum Use of Irish Soils

The Institute of Biology of the New University of Ulster, Northern Ireland, organizes a Symposium on Soil Biology and the optimum use of Irish Soils on 16 and 17 April 1971 in Coleraine, County Londonderry.

The central themes are:

1. Basic Problems of Decomposition and Soil Biology
2. Practical Problems in the Management of Irish Soils.

Any one interested is requested to apply for further information to:

Professor A. Macfadyen
School of Biological and Environmental Studies
The New University of Ulster
Coleraine, Co. Londonderry, N. Ireland.

SCHEFFER, F. und SCHACHTSCHABEL, P.; *Lehrbuch der Bodenkunde*, 7th ed. Ferd. Enke Verlag, Stuttgart, 1970, pp. 448, tables, graphs, photographs, DM 56.—.

If even a proof was needed that European soil science without "Scheffer-Schachtschabel" is hardly thinkable, the fact of the appearance of the 7th edition of their textbook would wipe out any doubt. Only four years after the publication of the sixth re-worked and enlarged issue, the 7th edition was needed to fill the demand for up-to-date information. The following chapters have been thoroughly revised: exchange capacity, soil acidity, soil structure, soil water with special consideration of water potentials, soil temperature, potash, phosphorus, nitrogen, clay transport, influence of groundwater and perched water, lateritisation, salinisation and moors. The section on soil classification has not been enlarged. Reference to the system adopted for the World Soil Map in the chapter on Principle of Soil Systematics could perhaps have been considered.

There is no doubt that also this 7th edition is a further confirmation of the special quality of Scheffer and Schachtschabel's textbook.

SULLIVAN GIBSON, J. and BATTEN, J. W.: *Soils. Their Nature, Classes, Distribution, Uses, and Care*, pp. 296, Univ. of Alabama Press, University, Alabama, U.S.A., 1970.

This book is meant to serve as a supplementary text for courses in geography in the secondary schools and the colleges. Its content is fully adapted to that purpose including information on such simple matters as the ionization of water, oxidation of iron, etc. The material is discussed in six chapters, the first three containing general information on the nature of soils and aspects of soil formation. Chapters 4 and 5 review the soil classes and soil distribution, whereas chapter 6 considers the soils as means for agricultural production. Each chapter is concluded with a word list for study and questions for consideration. In Appendix A elementary chemistry is dealt with, Appendix B provides detailed information on South Carolina soils and C discusses the important soil series of the U.S.A. In conclusion, a well illustrated, elementary textbook which will make easy reading for geography students in secondary schools.

FORDA, J. and PASAK, V. *Hydrologic and Climatic Function of Czechoslovak Peat Bogs*. Mimeogr. text pp. 358. English summary p. 293-358. *Scientific Monograph Research Institute for Land Reclamation and Improvement, Zbraslav n.Vlt, Czechoslovakia*, 1969.

This volume presents a description and evaluation of 32,000 ha of peat bogs in Czechoslovakia. A comparison has been made of bogs in their natural condition and those disturbed artificially to various degrees. For that purpose bogs of high as well as low altitude were chosen as objects of the study of their hydrologic and climatic functions. This included research of all factors assumed to influence the water regime, such as climate, micro-climate, geographic and geologic conditions, soil, vegetation, etc. This very thorough study leads to an understanding of the relations between the extent of peat in a basin, its outflow regime and the chemistry of both underground and surface waters, factors of great significance for the construction of dams in peat filled basins with respect to both the choice of the dam profile proper and to improvement and purification of water to be used primarily for drinking.

ENGELSTAD, Orvin P., Editor. *Nutrient Mobility in Soils: Accumulation and Losses*, pp. 81 + VII. Number 4 in the Soil Science Society of America Special Publication Series, 1970. Price \$ 3.50 (prepaid orders outside U.S.A. and Canada), SSSA, 677 South Segoe Road, Madison, Wisc. 53711, U.S.A.

This publication contains the 5 papers presented at a symposium held during the 1969 annual meeting of the Soil Science Society of America. The factors that affect the movement of nutrients in the soil are covered in these papers as well as the accumulation and losses that occur under natural processes of soil development. The present-day world wide topic of concern that is "pollution" runs like a continuous thread through the text, e.g. G. W. Thomas in the introduction to

paper no. 1: Soils and Climatic Factors which affect Nutrient Mobility writes: Nitrogen and phosphorus are the only nutrients that will be discussed since they are of the most interest in pollution, whereas L. B. Nelson in the final paper: Research needed to resolve the Plant Nutrient — Water Quality issue puts the question: Do fertilizers actually contribute to contamination of natural waters? Both B. A. Stewart and W. H. Garman after their review of Agricultural Practices in Relation to Nitrate Accumulation and Agricultural Nutrient Budget respectively arrive at the conclusion that properly handled agriculture meets the challenge of adequate production without polluting soil and water resources, adding no more nutrients to water than does nature herself. What nature does is discussed by A. W. Simonson in his contribution on: Loss of Nutrient Elements during Soil Formation, presenting evidence of appreciable mobility of nutrient elements during soil formation. A very worthwhile up-to-date review of the issue of nutrient mobility as it presents itself to-day.

PAPADAKIS, J., *Climates of the World, their Classification, Similitudes, Differences and Geographic Distribution, IV + 48 pages, and Agricultural Potentialities of World Climates, II + 70 pages, edited by the author, Cordoba 4564, Buenos Aires, Argentina.*

This is a revised edition of "Climates of the World and their Agricultural Potentialities" 1966. The first volume gives the definitions, in meteorologic figures, of the diagnostics used—winter type, summer type, humidity regimes, etc.—with explications how to compute them. Climates are divided into 10 groups, further and further subdivided; each of these groups is precisely defined, so that a mere comparison of the definitions of the climates of two places shows their similitudes and differences. Then the text shows the climates that are encountered in each country, with examples (places) of each one. The second volume deals with the climatic requirements of crops, expressed quantitatively in terms of the climatic diagnostics used in the classification. Then long tables give for each crop, or group of crops, the potentialities, and limitations of each climate for it. A table resumes the influence of the various climatic elements on plants. The problem of transfer of crops, varieties, or experience from one part of the world to another is put on a new basis: it is not necessary for climates to be similar; but their differences should not be such as to change the results obtained; two climates may be similar for a transfer, and dissimilar for another.

AUTHOR'S REVIEW

PAPADAKIS, J., *Fundamentals of Agronomy (Compendium of Crop Ecology), X + 74 pages, edited by the author, Cordoba 4564, Buenos Aires, Argentina.*

The first 6 chapters deal with crop response to environment; emphasis is given to the influence of light and night temperatures, the division of crops into two clearly separated groups, cryophilous—long day, and non-cryophilous—short day, water balance, plant population stress, and mutual influence of crops and soil. The following 8 chapters discuss cultural technology—tillage operations, rotations, fertilization, sowing—planting growth retardants, irrigation, pasture management—in the light of the relations studied in the first chapters. Emphasis is given to the fact, that "actual" fertility varies considerably in the interval of 1 or few months, and fertilization should be adequated to such variation; and to the possibility to increase the efficiency of fertilizers by combining them with growth retardants.

AUTHOR'S REVIEW

PHILLIPSON, J., Editor. *Methods of study in soil ecology. UNESCO Publ. 1970. Printers: Imprimeries Populaires de Genève, Switzerland. 303 pp. Price \$ 14.—.*

As number 2 in the series "Ecology and Conservation" (Ecology et conservation) UNESCO published the proceedings of the Paris Symposium "Methods of study in soil ecology", organized by UNESCO and the International Biological Programme (IBP) in 1967. The book deals with recent advances in the field of soil ecology with special emphasis on methods to study production and energy flow in soil ecosystems. The papers of the various authors have been grouped according to the subject into eleven parts. Beside general problems and views in many papers attention has been paid to the study of micro-organisms, soil fauna and litter production in particular.

I. "General problems in soil ecology" pp. 15—45.

A review of the Major problems facing ecologists in the study of soil ecosystems; Biogeographical aspects of soil ecology, and an example of Ecological studies on soils of the tropics.

II. "Structural aspects of soil ecosystems" pp. 45—81.

Presents a paper on Structural aspects of soil-surface-dwelling biocoenoses. With respect to this subject a definition of soil-surface is given. Very important contributions are the Assessment of terrestrial invertebrate populations, and the discussion on Soil Biocoenoses.

III. "Functional aspects of soil ecosystems" pp. 81—101.

A worthwhile Example of an experimental station set up in a natural environment for an integrated study of soil ecology; a summary of a Psychrometer to determine evaporation and transpiration; a view on Energetics of the litter-soil subsystem.

IV. "Methods for the study of production by soil micro-organisms" pp. 101—139.

This part has been composed of 7 papers and concludes with a general discussion on soil-micro-organisms. By soil micro-organisms are also meant soil protozoa. Very interesting is the paper on the rhizobium-clay interactions.

V. "Methods for the study of production by macrophytes" pp. 139—167.

Discusses litter production and, what is until now more vague, the production in root-systems. Attention has been paid to study of fungi in the rhizosphere and on root surfaces.

VI. "Soil respiration" pp. 167—175.

This part consists of only one paper on Soil metabolism in relation to ecosystem energy flow and to primary and secondary production.

VII. "Methods for the study of production by the soil mesofauna" pp. 175—215.

Six papers.

VIII. "Methods for the study of production by Arthropods of the macrofauna" pp. 215—243. Four papers.

IX. "Methods for the study of production by root-fluid feeders and Nematodes" pp. 243—261. Three papers.

X. "Methods for the study of production by earth-worms, Enchytraeids and Molluscs" pp. 261—295. Four papers.

XI. "Soil ecology in the next decade" pp. 295—300.

Consists of one paper dealing with problems in soil ecology requiring most urgent attention. A number of problems of quite different levels are discussed. It is stressed that studies on those levels are necessary for a harmonious development of soil ecology. Only by their integration will it be possible to make progress towards one of the most important goals of ecology: the understanding of the community as a dynamic system.

All in all a most valuable account of the present stage of knowledge and understanding of soil ecological problems.

GLOSSARY OF SOIL SCIENCE TERMS. SSSA Committees on Terminology. Pp. 32, ill. 1 fig., 7 tables. May 1970.

During the past 15 years the Soil Science Society of America has published several revisions of definitions or glossaries of soil science terms. The current issue is the last one. It differs from the 1965-edition through the inclusion of two appendices. Appendix I covers Soil Mineralogy and Appendix II terms in Soil Classification. The latter a.o. contains a review of terms related to the 7th Approximation (1960) and its 1967 supplement of the USDA Soil Survey Staff's Soil Classification.

Copies can be ordered from:

Soil Science Society of America
677 South Segoe Road
Madison, Wisconsin 53711, U.S.A.

Prices (for prepaid orders):

\$ 1.00 for 1 to 4 copies; \$ 0.80 for 5 to 25 copies; \$ 0.70 for 26 or more.

Selected Papers of the Symposium

ON

RECLAMATION OF SODIC AND SODA-SALINE SOILS

Yerevan, Armenian S.S.R., 1969



These papers did appear as Volume 18, Supplement to AGROKÉMIA ÉS TALATJAN, published by the Institute of Soil Science and Agrochemistry of the Hungarian Academy of Sciences, Budapest, Hungary.

Price for Members of the Society is US \$ 5.—.

Orders to: Office of the Secretary-General of the I.S.S.S.
63 Mauritskade, Amsterdam, Netherlands.

PALEOPEDOLOGY

Origin, Nature and Dating of Paleosols

Selected papers of the ISSS/INQUA/UNESCO
Symposium on the Age of Parent Materials and Soils
Amsterdam, Netherlands, August 10—15, 1970

Edited by
Dr Dan H. YAALON
The Hebrew University, Jerusalem

This volume of 320 pages, containing 30 papers, will be available May/June 1971. The price is \$ 8.— (+ \$ 0.75 postage) for members of ISSS and INQUA, and \$ 10.50 (+ postage) for libraries, institutions and non-members.

Copies are to be ordered through the office of the
Secretary General of the International
Society of Soil Science
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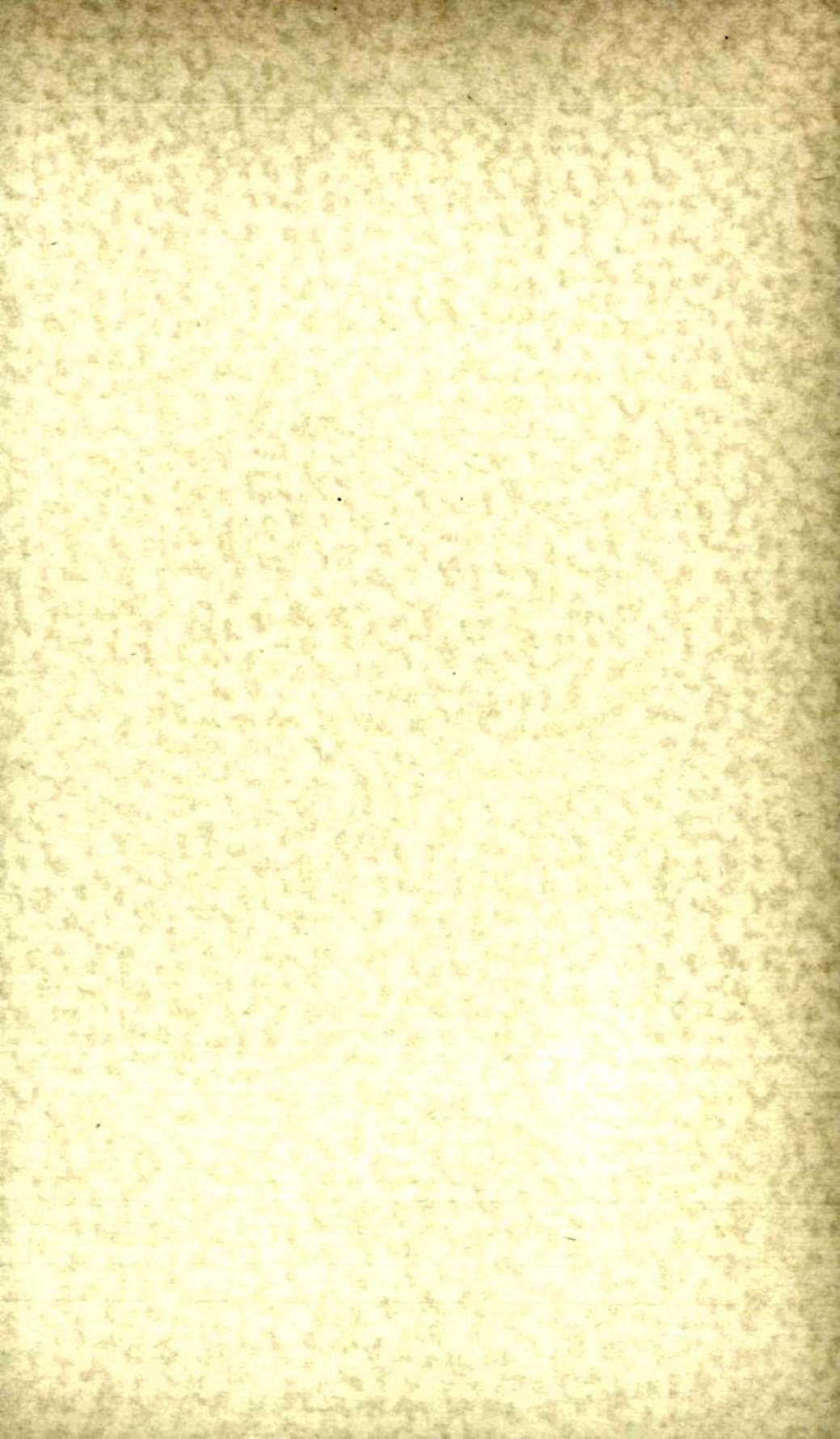
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PROCEEDINGS. New Series. Edited by the Executive Committee of the International Society of Soil Science. Editor in Chief. F. Schucht, Berlin, Assistant Editors: E. M. Crowther, Harpenden and A. J. Demolon, Versailles.

Vols. I and II of the Proceedings (1925 and 1926) contain chiefly original papers and further reports, literature, and communications regarding the Society.

Vol. I 1925. 306 pp. with numerous fig. and 2 coloured plates. In 4 parts. roy. 8vo. English or Spanish edition. Price 10.50 guilders

Vol. II. 1926. 376 pp. with 37 fig. and 3 plates. In 4 parts. roy. 8vo. English, French, Spanish or Italian edition. Price 8.40 guilders

From Vol. III onward no more separate editions were published and the Proceedings were divided into two Sections; I. Communications; II References to papers. Since then all communications and references have been written in either English, French or German.

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SOIL RESEARCH. Supplements to the Proceedings. One vol. is published every two years. Contains original papers in either English, French or German.

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Back numbers of several issues of the Proceedings and of Soil Research are still available, at the price of 2.60 guilders per number.

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First Commission (for the study of Soil Physics).

Meeting in VERSAILLES, July 1934. 332 pp. with many ill. roy. 8vo.

(9 guilders) 6.30 guilders

Meeting in BANGOR, Wales, 1939, Vol. A. 1938. 60 pp. roy. 8vo. 2.60 guilders

Second Commission (for the Study of Soil Chemistry).

Meeting in GRONINGEN, April 1926. Vol. A. 1926 and vol. B. 1927. Together 540 pp. with many ill. roy. 8vo.

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