

SOILS NEWS

AUSTRALIAN
SOCIETY
OF
SOIL
SCIENCE
INCORPORATED

No. 39

September 1975

AUSTRALIAN SOCIETY OF SOIL SCIENCE

Office Bearers of Federal Council and Branches 1975-6

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Treasurer : Mr I.G. Lee

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Richmond, Vic. 3121.

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SOILS NEWS

The Newsletter of the Australian Society of Soil Science

Number 39

September 1975

CONTENTS

	Page
News Items	
I.S.S.S. Commission I	3
4th International Working Meeting of Soil Micromorphology	3
Advisory Committee of A.J.S.R.	4
I.S.S.S. Commissions IV and V	4
Federal Council Notes	
Nineteenth Annual Report	6
Honorary Life Membership	7
Treasurer's Report	8
Balance Sheets	9,10,11
Prescott Medal 1975	12
News from the Branches	14
Summaries of Talks	18

Soils News is issued solely to financial members of the Australian Society of Soil Science, and is an informal news service of that body. It is published twice a year. The statements printed in it are not for citation elsewhere, and there are no reprints. Letters, articles, notices, reviews and news items from members are welcome and should be sent to: Mr K.M.W. Howes, Hon. Editor, Soils News, CSIRO Division of Land Resources Management, Private Bag, P.O., Wembley, W.A. 6014.

EDITORIAL

This is the third issue of "Soils News" for which I have acted as Editor. I can claim little success in altering the material which is contributed to the newsletter. In fact the reverse is true! There has been a steadily declining volume of material being offered for publication. This edition must be one of the shortest ever produced. Despite its brevity the escalating costs of production means that each of you is paying nearly \$1 to receive a copy. IS IT WORTH IT? I would say in the newsletter's present form the answer must be negative. The essential 'news' could be circulated in a lower quality production at a much lower price.

However, I'm not trying to talk myself or future Editors out of a job. I believe this newsletter could be made into a more worthwhile publication, retaining its quality of production and even expanding its length. But what do you want?

I believe "Soils News" can act as a forum for discussion of new ideas, techniques and research initiatives. In the last issue I suggested that it might also act as the vehicle for discussion on nomenclature. Possibly short review articles could be published.

This is your newsletter. Let me know what sort of information you would like to see in it (possibly you like it in its present form — let me know if that is the case). If you agree that it does require a 'face-lift' then it is up to you to contribute.

PRESIDENT'S LETTER

As I reach the mid-point of my term of office I begin to be aware that the Society seems to be passing through a rather quiet time. While Branches are busy with scientific conferences and talks, which are, after all, our main business, Federal Council seems very quiet, perhaps in part due to absence of contentious issues. Nevertheless, there are, today, public issues which soil scientists and our Society should be concerned, and should be actively discussing.

One important issue is the survey and evaluation of Australia's land resources. Dr E.G. Hallsworth is leading a Working Party to report to the Australian Agricultural Council on the need for soil surveys, and the Australian Department of the Environment is examining the necessity and appropriate techniques for land resource surveys and evaluations. What inputs to these discussions are coming from members of this Society?

While I have no doubt that some members are involved in various Committees and Task Forces, there could be most informative discussion and comment, which would be of great value, from our membership generally, and it could readily and quickly reach a wide audience in **Soils News**.

Many questions come to mind:-

- Are conventional soil surveys really needed?
- If land resource surveys are needed, what kind of information should they assemble?
- What is the place of studies of the hydrology of superficial aquifers in land resource evaluation?
- In these and other fields, what contribution can soil scientists make? Are their efforts inhibited by preoccupation with morphology and classification of the top metre, and its physical and chemical nature, when information is perhaps really needed on landscape features such as superficial deposits, deep weathering and drainage systems?

M.J. Mulcahy

NEWS ITEMS

I.S.S.S. COMMISSION I, ADELAIDE, AUGUST 23-27, 1976

Modification of Soil Structure

(Modification in relation to aggregate stability and water movement)

There will be two main themes for the discussions –

Physics of Soil Structure

interparticle forces and the arrangement of soil constituents in relation to the stability and mechanical strength of aggregates

2. Treatment of Soil –

the use of conditioners, inorganic amendments, tillage and biological agents for crop production, dams, water shedding, sand stabilisation and waste disposal.

There will be 3 days devoted to papers covering these two themes. One full day and one half day will be spent looking at soil structure in the field.

For information contact: Dr W.W. Emerson,
CSIRO Division of Soils,
Private Bag No. 1,
Glen Osmond,
South Australia, 5064.

4TH INTERNATIONAL WORKING MEETING ON SOIL MICROMORPHOLOGY

The following letter may be of interest to some members –

“Dear Sir: I would like to draw your attention to the following book on Soil Microscopy which has just been published, and I would be grateful if you would kindly draw your members’ attention to it through your National Soil Science Society Newsletter.

SOIL MICROSCOPY: The proceedings of the 4th International Working–Meeting in Soil Micromorphology held at the Department of Geography, Queen’s University, Kingston, Ontario, Canada.

This publication includes 53 articles on various aspects of the broad field of soil and sedimentary microscopy including:

SOIL MECHANICS	SOIL CLASSIFICATION
WEATHERING	EROSION
PHYSICAL GEOGRAPHY	SEDIMENTOLOGY
AGRICULTURE	MOON SOILS
EXPERIMENTAL PEDOLOGY	

As there is an ever-increasing range of techniques available to the soil microscopist and an intensified interest in the field, the working meeting organizers were glad to invite position papers by leading researchers on Soil Mechanics, Soil Organic Matter, Soil Micromorphometry, Soil Classification, Integration of Techniques and Soil Microscopy. There are approximately 900 pages with more than 240 black and white illustrations and figures, 77 tables and 16 pages of colour plates.

Price \$30.00. Cash prepaid to: The Limestone Press, P.O. Box 1604, Kingston, Ontario, K7L 5CB, Canada.

This will, no doubt, be a useful publication for many of your members and I thank you in anticipation for your interest and goodwill. Yours truly, signed G.K. Rutherford”

EDITORIAL ADVISORY COMMITTEE OF A.J.S.R.

1. Editor's report on Journal Status – 1974 was a lean year for the journal but the signs are that 1975 will be much better, with a considerable increase in number of papers coming forward. This was attributed to the policy modifications made in 1973-74. If correct, then the journal should grow to 3 issues annually and eventually four.

The Editor considers it important to keep unit costs down as low as possible and this can only be done by increasing the number of subscriptions. He pointed out that A.S.S.S. with some 550 members only has 140 subscribers to the journal. The cost of the journal to members is \$2.50 (a 50% discount) and is tax deductible, making it very cheap indeed. I was asked to recommend to Federal Council that it make a drive for more subscriptions from A.S.S.S. members. It was said that some Societies make it mandatory for members to take the appropriate journal.

2. Joint participation with New Zealand – On this question I reported the Society's views as related to me in your letter of June 16th. After considerable discussion there seemed to be general approval for some type of joint effort. I moved a motion which was passed, I think unanimously, to the effect that Mr Walby be asked to recommend to the Board of Standards that an approach be made by Mr Walby to the appropriate people in New Zealand with a view to cooperation over a joint Soils journal. If the Board of Standards approves, then the Australian Academy and CSIRO Executive also need to approve before the approach can be made. There was discussion as to what the name should be, if a joint journal is agreed to. I think the general concensus was against including reference to geographical location; this question will, of course, be raised in later discussion.
3. Request by Hydrologists to change the name of the Journal – This item was brought to the South Australian Board by Dr G. Allison. Several Hydrological Societies (S.A. and A.C.T.) submitted cases to the Editor, as did Dr A.E. Martin, who suggested the name be changed to "Soil and Water Research".

The outcome of our discussions was that we did not favour such a change, mainly because the nature of the Journal could be changed radically if, as was suspected, a large number of hydrologic papers came forward to it. The journal will continue to accept hydrologic papers with a soil bias of some sort.

INTERNATIONAL SOCIETY OF SOIL SCIENCE COMMISSIONS IV AND V CONFERENCE

The Council of the International Soil Science Society in its meeting in Moscow on August 17th, 1974 agreed to have a joint inter-congress meeting of two Commissions of the International Soil Science Society: Commission V (Soil Genesis, Classification and Cartography) and Commission IV (Soil Fertility and Plant Nutrition). The Symposium will take place in Kuala Lumpur, Malaysia from the 2nd to the 6th August, 1976 under the title: "Classification and Management of Tropical Soils", subject to the formal approval of the Government of Malaysia.

The following are the main suggested topics for voluntary papers:

1. *SOIL GENESIS, CLASSIFICATION AND CARTOGRAPHY*
 - (A) Soil genesis
 - (B) Soil classification and productivity
 - (C) Soil surveys and cartography
2. *FERTILITY AND MANAGEMENT*
 - (A) Evaluation of fertility status and fertilizer requirements
 - (a) Tissue analysis in relation to fertilizer needs
 - (b) Soil analysis in relation to fertilizer needs
 - (c) Fertilizer requirements of (i) rice
(ii) plantation crops
(iii) other arable crops
 - (B) Systems of tropical soil management
 - (C) Management of flooded soils
 - (D) Soil management for plantation crops
 - (E) Soil management for arable crops
 - (F) Management of problem soils in the tropics

Following the Conference, there would be a post-Conference field tour both in Peninsular Malaysia as well as in Sarawak and Sabah. Emphasis of the tour will be to demonstrate various points of particular relevance to the theme of the Conference and would include soils and crop management aspects.

In the process of organizing this Conference, the Malaysian Society of Soil Science is seeking formal approval from the Government of Malaysia. We are confident that this approval and support would be formalised in the near future.

Meanwhile, the Society is already initiating ground work in the organizing of the Conference. The first step needless to say, is to issue out the preliminary announcements once the Government of Malaysia has formally approved the staging of the Conference. In this respect, we are currently preparing a preliminary announcement which we hope to despatch to the Secretary ISSS before the end of September, 1975 for his distribution to the individual members.

FEDERAL COUNCIL NOTES

NINETEENTH ANNUAL REPORT FOR THE YEAR ENDING 30 JUNE, 1975

PRESIDENT Dr M.J. Mulcahy

VICE PRESIDENT Dr A.N. Smith (proxy Dr W. Bowden)

BRANCH PRESIDENTS

A.C.T. — Dr B.G. Williams (proxy Mr T. Stoneman)
N.S.W. — Dr B.G. Davey (proxy Mr D. Williamson)
QLD. — Mr B.J. Crack (proxy Mr J. Jago)
Riverina — Mr S. Pels (proxy Mr P.G. Ozanne)
S.A. — Mr G. Blackburn (proxy Mr W.M. McArthur)
Victoria — Mr I.J. Sargeant (proxy Mr E. Bettenay)
W.A. — Dr R.J. Gilkes

Hon. Secretary — Dr N.J. Barrow
Hon. Treasurer — Mr G.M. Dimmock
Hon. Auditor — Ms J. Jervis
Hon. Editor — Mr K.M.W. Howes

MEETINGS

Four ordinary meetings of Council were held during the year.

SOILS NEWS

The Hon. Editor produced issues Nos. 37 and 38 of Soils News.

MEMBERSHIP

Forty one new members were admitted to the Society, 6 resigned and 4 were removed from the register under By-law 4. Total membership stands at 568.

COMMITTEES

The Prescott medal committee recommended that the 1975 medal be awarded to Dr J.P. Quirk. Council accepted the advice of the previous committee and agreed to award the medal annually.

THE MONOGRAPH

The monograph was completed at the end of May and sent to the publisher. Costing and other negotiations are still in progress.

The soil stratigraphic committee recommended that the Society decline the Australian Geological Society's invitation to nominate a Soil Stratigraphic committee and that the committee be disbanded.

MEMBERSHIP FEES

Reduced fees for students were introduced by adopting the policy that all except \$1 of fees for students be remitted.

During the year the Treasurer was authorised to transfer as much as possible of Society funds to a building society account in order to attract a higher interest rate.

HONORARY MEMBERSHIP

Professor L.J.H. Teakle of the Queensland branch and Mr G.H. Burvill of the W.A. branch were both admitted to honorary membership during the year.

AUSTRALIAN JOURNAL OF SOIL RESEARCH

A proposal for a joint Australian-New Zealand journal was received from the NZ Society. The opinion of members of our Society was sought. Overall the society favoured the idea – though in some branches there was a majority against. The opinions of the society were presented at a meeting of the Advisory committee by Dr J. Loveday. He reported that a recommendation was made to the Board of Standards that an approach to the appropriate people in New Zealand be made with a view to cooperation. The Australian Academy and the CSIRO Executive would also have to approve any joint effort.

Dr Loveday also reported that the number of papers being submitted to the Australian Journal of Soil Research was increasing and that this seemed to be a response to policy modifications in 1973-74.

I.S.S.S. MEETING

The I.S.S.S. Council meeting in Moscow in August 1974 recommended a meeting of Commission I on soil conditioning be held in Australia. The meeting is to be held in Adelaide on August 23-27, 1976.

N.J. Barrow
Honorary Federal Secretary

HONORARY LIFE MEMBERSHIP

As you will have seen in the last edition of Soils News, Honorary Life Membership was awarded to Mr G.H. Burvill and Professor L.J.H. Teakle. The letters written to the President by Mr Burvill and Professor Teakle in response to the award are reproduced below.

“Dear Dr Mulcahy – It was a great pleasure, indeed, a surprise, to receive your letter of March 20th, advising of the offer of the Honorary Membership in the Society. This I gladly accept as a great honour by the Profession and thank the Society very sincerely. It brings to my memory many happenings, both professional and social, when I was active in work in soil science in Australia. One of my losses when I transferred to administrative work in the University of Queensland was virtual severance from Soil Science and other professional activities which had meant so much to me over nearly four decades.

For my name to be linked with that of Mr George Burvill in the award adds much to my personal pleasure. He is a man of great talents and achievements, and a loyal colleague who contributed much to Soil Science in Australia.

With congratulations to you as President and thanks to the Society for the honour bestowed.
Yours sincerely, signed Hartley Teakle.”

“Dear Maurice – I greatly appreciate the proposal that I should accept Honorary Membership for Life in the Society. I accept with pride and pleasure and ask you to convey my appreciation to the Federal Council. That the proposal should come during your term as Federal President is an added pleasure, also to know that Professor Teakle, my mentor and long time colleague in soil science (1928-1947) is also to be honoured with Membership for Life. Yours sincerely, signed George Burvill.”

TREASURER'S REPORT FOR THE YEAR 1 JULY 1974 TO 30 JUNE 1975

MEMBERSHIP AND SUBSCRIPTION DETAILS

Branch	Total	New Members		Paid					Not Financial
		Ord.	Student	71/72	72/73	73/74	74/75	75/76	
A.C.T.	64	4	1	—	—	3	58	1	2
N.S.W.	80	8	1	—	1	3	60	—	19
O/Seas	19	—	—	1	2	3	15	—	4
Qld.	113	13	2	—	—	9	99	7	11
Riverina	44	3	—	—	1	1	32	3	12
S.A.	108	1	3	—	1	10	86	2	20
Vic.	71	—	—	—	2	7	43	—	11
W.A.	69	1	4	—	1	5	51	—	14
	568	30	11	1	8	41	444	13	93

The Society's Balance Sheet and Statements of Receipts and Expenditure for the various accounts for the 1974/75 financial year are attached. There has been a steady growth in membership but the large number of unfinancial members (approximately 16%) is a continuing source of concern. Despite this, the monetary state of the Society appears to be satisfactory.

G.M. Dimmock (Hon. Federal Treasurer)

PAY UP AND PLAY THE GAME!

(A Plea from the Hon. Federal Treasurer)

Members should have received by now, notices from Branch Treasurers that 1975/76 subscriptions to A.S.S.S. Inc. and 1976 subscriptions to A.J.S.R. and I.S.S.S. are due as from 1 July. Subscriptions to A.S.S.S. Inc. paid before 30 September carry a \$1 rebate for prompt payment. It is most important that members wishing to subscribe to A.J.S.R. and/or I.S.S.S. (\$3 each for 1976) make the appropriate payments to their Branch Treasurers by the **end of November 1975**. This is to ensure that the subscriptions reach me by the end of December, when bulk orders/subscriptions are placed. Late subscriptions to A.J.S.R. and I.S.S.S. cannot be accepted.

G.M. Dimmock (Hon. Federal Treasurer)

AUSTRALIAN SOCIETY OF SOIL SCIENCE INCORPORATED – FEDERAL COUNCIL
Balance Sheet as at 30/6/75

ASSETS	\$	LIABILITIES	\$
General Funds		Accumulated funds brought forward	6056.46
Cash	8.47	Add	
Current A/c Bank of N.S.W., Floreat Forum Branch	901.79	General A/c	
Perth Building Society A/c No. 187959	2088.21	Excess receipts over expenditure	583.39
Special (Monograph) Account		Monograph A/c	
Cash	65.90	Excess expenditure over receipts	<u>17.86</u>
Commonwealth Savings Bank of Aust. Savings Investment A/c No. A272, Wembley, W.A.	3557.62		565.53
	<u>6621.99</u>		<u>565.53</u>
	<u><u>6621.99</u></u>		<u><u>6621.99</u></u>

I have examined the Books of Account of the Australian Society of Soil Science Incorporated as at 30th June, 1975, and I certify the financial position as described in the above statement is correct.

Prepared by G.M. Dimmock
Honorary Federal Treasurer

J. Jervis
(Honorary Auditor)

AUSTRALIAN SOCIETY OF SOIL SCIENCE INCORPORATED – FEDERAL COUNCIL GENERAL ACCOUNT
Statement of Receipts and Expenditure for the period 1/7/74 to 30/6/75

Receipts	\$	Expenditure	\$
A.S.S.S. Inc. Subscriptions		Printing: Soils News No.37 and	
1971/72 1 @ \$3.50	3.50	Membership List	394.90
1972/73 8 @ \$2.50 or \$3.50	26.00	Soils News No.38	338.50
1973/74 41 @ \$2.50 or \$3.50	138.50	Typing and duplicating	76.70
1974/75 429 @ \$2.50 or \$3.50	1149.50	Incorporation expenses	1.50
1974/75 2 @ \$1.50; 4 @ \$1.25;		Postage	61.09
9 @ \$1.00	17.00	Stationery	122.03
1975/76 11 @ \$2.50; 2 @ \$1.00	29.50	Prescott Medal Cases	11.80
Members' individual credits	11.25	Prescott Medal Engraving	1.65
A.J.S.R. Subscriptions		Honoraria	40.00
1974 1 @ \$1.50; 1 @ \$2.50	4.00	Exchange on Interstate cheques	3.20
1975 156 @ \$2.50; 5 @ \$2.20; 1 @ \$2.25	403.25	Bank charges	7.50
1976 5 @ \$2.50	12.50	A.J.S.R. (Vol. 12): 3 @ \$2.50	7.50
I.S.S.S. Subscriptions		(Vol. 13): 138 @ \$2.50	345.00
1974 11 @ \$3.00	33.00	I.S.S.S. Subscriptions: 154 @ \$3.00(U.S.)	345.51
1975 168 @ \$3.00	504.00	Refund of postage to Branches for	
1976 3 @ \$3.00	9.00	"Soils News" distribution	35.73
Overpayments by S.A. Branch	10.00	Petty Cash banked on transfer	9.00
Less Reimbursement	<u>3.00</u>	Miscellaneous refunds to Branches	18.34
	7.00	Loan against Spec. A/c No.3 (drafting of	
W.A. Branch Subs. (A/c Finkl)	1.59	diagrams for Monograph	240.00
Petty Cash Residue from Canberra	9.00	Freight on transfer of Federal records	62.05
Refund of Bank Fees	4.50	Freight on distribution of "Soils News" No.37	31.12
Building Society Interest	88.21	Excess Receipts over Expenditure	583.39
Bank Interest	45.21		
Reimbursement of loan against Spec. A/c No.3	240.00		
	<u>2736.51</u>		<u>2736.51</u>

-10-

I have examined the Books of Account of the Australian Society of Soil Science Incorporated as at 30th June, 1975, and I certify the financial positions as described in the above statements is correct.

Prepared by G.M. Dimmock
Honorary Federal Treasurer

J. Jervis
(Honorary Auditor)

AUSTRALIAN SOCIETY OF SOIL SCIENCE INCORPORATED – FEDERAL COUNCIL
Special (Monograph) Account No. 3

Statement of Receipts and Expenditure for the period 1/7/74 to 30/6/75

RECEIPTS	\$	EXPENDITURE	\$
Interest	240.72	Drafting diagrams for Monograph	240.00
Excess expenditure over income	17.86	Telephone	18.58
	<u>258.58</u>		<u>258.58</u>

I have examined the Books of Account of the Australian Society of Soil Science as at 30th June, 1975, and I certify the financial position as described in the above statements is correct.

Prepared by G.M. Dimmock
Hon. Federal Treasurer

J. Jervis
Honorary Auditor

PRESCOTT MEDAL

Professor J.P. Quirk F.A.A. has been awarded the Prescott Medal for 1975. The following is a brief synopsis of his career and many contributions to soil science.

J.P. Quirk – Prescott Medallist

In 1947 Professor Quirk graduated with first class honours in Agricultural Chemistry at the University of Sydney. He presented a thesis "The Hydraulic Characteristics of Laminar Sheet Flow in Relation to Run-off and Erosion". On graduation he was appointed to the Soil Physics Section of the CSIRO Division of Soils to work on soil structure, and in 1950 he was awarded a CSIRO Senior Postgraduate Studentship to work with the late Dr. R.K. Schofield in the Physics Department at Rothamsted Experimental Station. He was awarded the Ph.D of the University of London for a thesis "Deflocculation of Soil Colloids".

In 1956 Professor Quirk was invited to succeed Dr. C.S. Piper and became Reader in Soil Science at the Waite Agricultural Research Institute. He developed a section within the Department of Agricultural Chemistry which established an international reputation for its research on soil structure, surface chemistry of soil colloids and transport of nutrients in soils.

In 1962 he was invited by the University of Western Australia to be Foundation Professor of Soil Science.

In 1967 he was appointed Commonwealth Visiting Professor in the Department of Agriculture at the University of Oxford, and also in that year was awarded the Doctor of Science by the University of London for his published research on "The Surface Chemistry and Physical Interaction of Soil Colloids".

In 1971 Professor Quirk was appointed Director of the Institute of Agriculture in the University of Western Australia. He was elected into Fellowship of the Australian Academy in 1973.

Professor Quirk has been External Examiner in Soil Science to the University of Malaya and in 1972 visited Indonesia on behalf of the Australian Vice-Chancellors' Committee to carry out a survey of the teaching of Soil Science in Indonesian University Schools of Agriculture.

Since July 1974 Professor Quirk has been Director of the Waite Agricultural Research Institute.

Over a period of sixteen years, Professor Quirk has played a leading role in the development of courses in Soil Science at two Universities. At the undergraduate level, he has the reputation of being a clear and effective teacher who communicates enthusiasm to students. The quality and depth of his research has attracted many postgraduate students from a wide range of countries to work under his supervision. He was for several years convener of the Australian Soil Science Society Committee on Academic Training in Soil Science in Australia.

In collaboration with his students and academic colleagues he has contributed to some 150 publications. Most widely known of these are the classic paper on the reclamation of sodic soils and irrigation water quality and the paper treating the specific application to pasture establishment in the Riverina district of N.S.W.

Professor Quirk has been President of the Australian Soil Science Society, Vice-President of the International Soil Science Society and President of the South Australian Branch of the Australian Soil Science Society, and held other positions in that Branch. He has been President of the Agricultural Sciences Club at the Waite Institute and has served on the Committee of the Australian Institute of Agricultural Science in South Australia and Western Australia, being past President of the latter Branch. He has also been President of the Australian Clay Minerals Society.

As President of the Australian Soil Science Society, Professor Quirk presented the case at Bucharest in 1964 for the IXth International Congress to be held in Australia. As Vice-Chairman of the Organizing Committee for the IXth Congress he was deeply involved in the organization of that Congress.

In 1973, Professor Quirk was elected a Fellow of the Australian Academy of Science "in recognition of his distinguished contribution to the natural sciences". He is a Fellow of the Australian Institute of Agricultural Science and the Royal Australian Chemical Institute.

Professor Quirk has taken an active part in University affairs at the University of Western Australia. He was a member of the University Senate, Foundation Chairman of the Academic Council and Chairman of the Professorial Board. He has also been President of the Staff Association, and took an active interest in research administration and financing in Universities and was one of the authors of a monograph on Research in Australian Universities.

He has recently been in Egypt on behalf of the F.A.O. and the Egyptian Government, advising on soil management and irrigation.

PRESCOTT MEDAL COMMITTEE

Dr R. Storrier has completed his term on the Prescott Medal Committee. Mr Ken Rowe of the Victorian Soil Conservation Ministry has replaced him. The other two members of the Committee are Dr Adrian Peck, Chairman, and Dr Glyn Bowen.

NEWS FROM THE BRANCHES

WESTERN AUSTRALIA

Branch Notes

Two post-graduate students from the Department of Soil Science and Nutrition, W.A. University gave talks at a general meeting in April as follows:

Mr Pandia on "Mineral and chemical studies of some Swan Coastal Plain soils".

Mr D. Carter on "Water soluble organic matter as a source of energy for soil microorganisms".

Dr A.D. Robson from the same university department spoke to the branch in August on the topic "Towards improving fertilizer use".

Dr R.J. Gilkes is at Rothamsted for about twelve months.

Dr A.J. Peck is visiting the Oak Ridge National Laboratory, Tennessee.

NEW SOUTH WALES

Branch Notes

The Branch held a Conference entitled "Soils of New South Wales" during 23 – 25 May at Tamworth. The Conference received strong support from amongst the Branch's members as well as from members of both the Riverina and A.C.T. Branches. Those who attended voted it a huge success, both from an intellectual standpoint and as a means of renewing contacts with other members. It was resolved at the Branch Annual General Meeting, held in conjunction with the Conference, that a Conference of similar duration and intent be held in 1976 by one of the Riverina, A.C.T. or N.S.W. Branches. The Committee extends its thanks to all those who assisted in the organization of the Conference and contributed papers to the Conference. The field excursion, organized by local Branch members from the University of New England, Armidale and the N.S.W. Department of Agriculture, Tamworth, was particularly successful.

On 20 March, the Branch held a General Meeting which was addressed by Professor K.C. Marshall, Department of Microbiology, University of New South Wales on "Microorganisms and physical components of soils".

On 8 August, Dr M.D. Melville, School of Geography, University of New South Wales spoke on "Models of respiration and oxygen diffusion for organisms in soils", at a General Meeting held at the University of Sydney.

The School of Geography, University of New South Wales and the N.S.W. Branch, in conjunction, will be holding a one-day symposium entitled "Land Resources Evaluation in N.S.W." on 20 February, 1976. Further details on the symposium are available from Dr P.A. Burrough, School of Geography, University of New South Wales, P.O. Box 1, Kensington, N.S.W. 2033.

QUEENSLAND

Branch Notes

On 30 April, Dr A. Moore addressed the Branch on "Site Information Systems". On 6 August, Dr L.C. Bell spoke on the first of a series of addresses on the general theme of "Soils and the Environment" and his talk was entitled "Mini-waste rehabilitation – problems and approaches".

On 11 June, the Annual General Meeting was held and the meeting was addressed by Mr B.J. Crack on "Soil Science in the Queensland Department of Primary Industries".

Personal Notes

Dr S.A. Waring participated in a short course on tropical pastures in Thailand where he lectured in aspects of soil fertility in relation to pasture production.

Dr G.G. Beckmann is on an overseas visit for six months. His itinerary includes visits to various research centres in U.S.A., Canada, Europe and South Africa.

Mr R.M. Jones has recently returned from a six month visit to various scientific institutions in the U.K. and U.S.A.

SOUTH AUSTRALIA

Branch Notes

Three ordinary meetings of the South Australian Branch were held in the last six months.

Professor R.L. Thomas, University of Guelph, spoke to the Branch on "Organic phosphorus studies in soils" on 4 March. A panel of speakers – Dr J.M. Oades, Mr P. King and Mr C. Wells, described the highlights of the Soils Congress Tours, 1974 at a meeting held on 20 May. On 19 August, Mr R.D. Bond gave an address to the Branch on "Germination and yields of cereals on water-repellent sands".

The Annual General Meeting was held on 19 June, when Mr G. Blackburn presented his Presidential Address, entitled "Murray Valley salinity problems".

A Field Day was held on 18 April, when some 40 members visited the Bremer Valley – Monarto area. Features of the hydrological, salinity and stratigraphic investigations of the area were discussed by W. Matheson, D.J. Chittleborough and R.A. Rallings. Following a barbecue lunch, officers of the Monarto Development Commission described their activities in the area.

Personal Notes

Dr A.L. Clarke has resigned from the South Australian Department of Agriculture to take up the position of Director of the Wheat Research Institute of Toowoomba.

Mr R. French has spent 3 months travelling in the U.S., Canada and Britain studying ecological modelling.

Mr K. Wetherby has moved to Cleve and is the South Australian Department of Agriculture's first pedologist on the West Coast.

Dr J.M. Oades and Dr R. Graham are on 12 months sabbatical leave from the Waite Institute and in each case the time will be divided between two institutions. Dr Oades will visit the University of Natal and the University of Reading while Dr Graham is visiting Rothamsted Experimental Station and the University of Aberdeen. Dr A. Alston has recently returned from his visit to Guelph.

Mr R. McKenzie attended the International Clay Conference in Mexico, followed by a short tour of the U.S.A. and Canada.

Mr M.P. de Vries will shortly leave on a four months study tour to attend the International Conference on Heavy Metals in the Environment, in conjunction with visits to the U.S.A., Canada, Britain and Europe.

Mr G.D. Bowen will make a private tour to attend an *International Conference on Crop Productivity* to be held in Michigan in October.

Dr A.E. Martin was a member of a deligation which studied Plant Industry in the U.S.S.R. under the Scientific Exchange Agreement between Australia and the U.S.S.R.

The Third Specialist Conference in Soil Biology will be held at the Division of Soils, Adelaide from 25 – 29 August.

AUSTRALIAN CAPITAL TERRITORY

Branch Notes

At our Annual General Meeting in June, our outgoing President, Dr B.G. Williams (CSIRO Division of Land Use Research, Canberra) discussed "Equilibria in Soil Solutions". A sub-committee was formed to investigate the provision of local soil sites for educational purposes. Professor S.S. Khanwa (Haryana Agricultural University, Hissar, India) recently addressed us on Soil Science research at his University.

Personal Notes

Drs J. Loveday, T. Talsma and C. Watson recently took part in a workshop on the Properties of Irrigation Soils at Dookie, Victoria. Dr J.T. Ritchie, after some months in Canberra with Dr J.B. Passioura (CSIRO Division of Plant Industry), has now left for the CSIRO Division of Land Resources Management in Perth, before returning to Temple, Texas, U.S.A.

VICTORIA

Branch Notes

Activities of the Branch over the last 12 months centred around meetings on two subjects, Westernport Bay and I.S.S.S. Conference, Russia.

Four meetings were held on the Westernport Bay Catchment and covered various aspects such as Geology, Hydrogeology of Soils, Land Use and Water Quality and the series was capped by an excellent full-day excursion to the area which was conducted by Jeff Jenkins and Ian Sargaent, concentrating on Geology and Soils of the area.

Two meetings centred around the I.S.S.S. Conference. Four members, Alex Mitchell, Irwin Walbran, Charles Lamp and Frank Gibbons gave talks at two evening meetings attended by members and their families. Both were very enjoyable meetings.

Personal Notes

Steve Willatt left for the U.S. in May and will be overseas for 12 months. While absent, Nick Uren is acting as his proxy on the Victorian Branch Committee.

In early July, Keith Turner, also a Committee member of long standing, felt recent commitments in hydrology made it difficult for him to continue in his capacity as a Committee member and resigned. We would like to thank Keith for his work for the Society over the years and look forward to his continued participation in Branch activities.

The Branch's long association with Melbourne University will continue, however, since Lyle Douglas has been elected to fill the vacancy left by Keith's resignation.

A number of members have, and are about to join the ranks of the leisured class in retirement.

Jim Newell retired from the Agricultural Chemistry Laboratory, he is to be joined by Irwin Walbran at the end of September. The Soils Section is rather depleted with the retirement of Jim and Irwin, and we wish both a happy retirement and look forward to seeing them at Branch activities.

Austin Webster is overseas at the moment, after attending an Irrigation Conference in Moscow and still sending his comrade postcards from Russia. He returns at the end of September.

SUMMARIES OF TALKS

MODELS OF RESPIRATION AND OXYGEN DIFFUSION FOR ORGANISMS IN SOILS

(by M.D. Melville to N.S.W. Branch)

Mathematical analyses of diffusion models have been used by many workers to calculate the oxygen concentration distribution in soils and soil organisms, but few such investigations have been carried out for seeds.

In studying the effect of the external partial pressure of oxygen upon seed germination, the definition of the oxygen concentration distribution within the seed is necessary in order to avoid confusion of oxygen deficit effects *per se* with effects of germination inhibitors.

Solutions to the equations describing diffusion coupled to either an irreversible zero-order chemical reaction or to an irreversible first-order reaction have been published for a number of boundary conditions. After making several simplifying but justifiable assumptions, the steady-state solutions for radial diffusion, accompanied by a chemical reaction were used in the analysis of two models of oxygen diffusion and respiration for spherical, water saturated bodies of uniform properties with a constant surface concentration of oxygen.

The first model presented was that which most workers have used previously and it assumed that the overall respiration reaction proceeded as a zero-order chemical reaction. Thus the respiration rate was constant and at a maximum at all respiration sites within the sphere whenever the oxygen concentration exceeded zero.

The second model, which was termed 'the concentric shell model', assumed that respiration was a zero-order reaction at large external partial pressures of oxygen (p_a) and a first-order reaction at small values of p_a . At intermediate values of p_a , the sphere was partitioned into an inner sphere where a first-order reaction occurred and an outer shell where a zero-order reaction occurred.

Using similar assumptions and analysis methods as for the second model, a third model was presented for a spherical, water saturated body enclosed in an inert outer shell of low oxygen permeability.

After assuming that the absorption and diffusion coefficients of oxygen in seed material were the same as in pure water, example calculations were presented for the three models using published oxygen uptake data for intact and decoated spherical seeds.

For any p_a equal to or less than normal atmospheric p_a , the oxygen concentration distribution calculated using the first model predicted an anaerobic core within the decoated seed while the second model predicted a finite oxygen concentration at the seed centre. However the total oxygen uptake by a seed predicted by the two models were very similar and gave a good match to experimental values which only demonstrated that prediction of total uptake was not a valid test of an absorption model.

The oxygen concentration distribution calculated for intact seeds in air using the third model predicted that more than 60% of the seed volume would have insufficient oxygen for growth if the absorption and diffusion coefficients of oxygen in the seed embryo material were the same as in pure water. However if a smaller value of the diffusion coefficient as reported in the literature was used, nearly 90% of the seed volume had insufficient oxygen and this suggested that the reported lack of germination for these seeds was not necessarily due to the presence of specific inhibitors.

The respiration behaviour assumed in these models was qualitatively compared with that of the Michaelis-Menten relationship and the relationship of the predicted value of the Michaelis constant to the assumed value of the oxygen diffusion coefficient was discussed. Because of their importance in the calculations, the likely values of the absorption and diffusion coefficients of oxygen in the seed material were examined and while their exact magnitude could not be predicted, nearly all evidence suggested that they would be significantly less than those in pure water.

The problems associated with verification of the proposed models using conventional oxygen sensors to determine the concentration distribution in seeds were discussed and it was concluded that considerable technical difficulty would be found in making such measurements in bodies the size of most seeds. The application of a recently developed oxygen sensor system which utilizes bacterial bioluminescence was briefly outlined.

While the models proposed and tested referred specifically to spherical seeds, the principles of the models and their analyses had application to a wide range of soil organisms and soil systems but some technical difficulties relating to oxygen measurement need to be overcome.

STUDIES OF ORGANIC PHOSPHORUS COMPOUNDS FROM SOIL

(by R.L. Thomas to S.A. Branch)

Several aspects of organic phosphorus in soil were reviewed. Most of the work was done on extracts prepared using Dowex A-1 chelating resin as the extractant. This procedure extracts almost as much as the more complicated Mehta procedure, but is much simpler. Also, since the resin is solid, it is readily removed from the extract. The extract obtained contains much less contaminating base and is therefore more easily concentrated and fractionated.

Fractionations by gel filtration were described. Low molecular weight fractions contained inositol phosphates. The organic phosphorus in the high molecular weight fraction could not be shown to contain inositol phosphates. However, after hydrolysis, inositol was released in sufficient quantities to account for the phosphorus present if all of the phosphorus was linked to inositol as inositol hexaphosphates.

Enzyme studies of the various fractions indicated that only about one-third of the high molecular weight phosphorus could be hydrolyzed by a phytase from *Aspergillus ficuum*. This could be increased to about 60% if Fe and Al were partly removed. It was suggested that polyvalent cation links were probably interfering with the enzyme reaction.

MURRAY VALLEY SALINITY PROBLEMS

(Summary of Presidential Address by G. Blackburn at the Annual General Meeting of the S.A. Branch, June 1975)

The salinity problems of the Murray Valley include those due to soluble elements in concentrations deleterious to plant growth and those involving sodicity. Salt damage in irrigated horticulture has been recorded widely since the first extensive development of the new industry near the Murray, at Mildura in 1887. This evidence of the trouble was partly responsible for the establishment of the CSIRO Division of Soils in 1929. Latterly, with increased interest in environmental problems – apparently influenced by publication of 'Silent Spring' (1962) – salinity in the Murray Valley has come to be regarded as more than an agricultural problem. Now, with current interest in new urban development at Monarto, S.A., salinity has entered into considerations of town planning within the Murray Valley.

Early attention to soil salinity in relation to irrigated horticulture near the Murray is represented by the stationary investigations of J.E. Thomas at Merbein (1927-1937) and by soil surveys of the various settlements. These studies emphasised the need for drainage and leaching to reclaim salted areas and avoid the problem, and for care in selection of soils to be irrigated in new settlements. When drainage works were undertaken and all essential soil surveys were completed, the horticultural salinity problems may have seemed to be virtually under control. However, at the time – about 20 years ago – there was a major change in irrigation method, due to the growing use of sprinkler irrigation. A new type of salinity problem for the Murray Valley then appeared when the more saline river water associated with periods of low river flow, e.g. 1967-68, caused foliar damage to citrus and stone-fruit trees irrigated by the overhead sprinkler systems. Then came the initiative of the River Murray Commission in requesting a detailed study by consultants: Gutteridge, Haskins & Davey in association with Hunting Technical Services. Following their voluminous report in 1970 were the holding of a Salinity Symposium at Mildura (1971) and a National Symposium on salinity and water use at Canberra (1971), renewed attention by CSIRO and State authorities to salinity in the region, and the establishment of the River Murray Working Party on salinity problems (1973).

The speaker was one of a small group in the Division of Soils which became involved in the renewed attention to Murray Valley salinity. The first work began at Loxton in 1971 with the choice of a characteristic area of highland for inauguration of irrigation and measuring the subsequent changes in soil salinity below a stand of lucerne. The project was intended to study the lateral and vertical components of salt movement in the undulating system of alternating sandridges and swales. Inspections before irrigation showed that coarse sand (Loxton Sands) lies at a depth of 5 m below swales and runs horizontally below sandridges. Above the sand bed is a thick layer (3-4 m) of sandy clay which is saline and highly sodic throughout, but quite acidic at depth and alkaline in its upper part. This material – possibly buried soil – grades into the subsoils of the swales and underlies the deep sandy calcareous soils of the ridges.

Under the combined effect of rainfall and irrigation, which totalled about 4650 mm for a period of 2 ¼ years, the chloride content of soil to a depth of 4 m was reduced by 54% on the swales, 90% on the slopes, and 75% on a ridge crest. A substantial decrease of salinity in the deeper layers points to considerable movement of water through the sandy clay. No positive evidence has been obtained of lateral movement of salts.

Sandy clay which is acid at depth has been reported from deep borings in soil surveys of other unirrigated areas near the Murray and is known elsewhere in the region. Transmission of irrigation drainage water through this layer may be important enough to affect the interpretation of 'salt balance' and 'leaching requirement' studies. Such movement might constitute a flow of saline water to regional groundwater and possibly even to the River Murray. Whether the sandy clay underlying the experimentally irrigated soils at Loxton retains its permeability after future irrigation is still to be determined, but for the Loxton Irrigation Area there are suggestions that it remains permeable at least in those places where there has been no resort to artificial drainage. Future investigations should give attention to variations in the properties of the sodic clayey layers, and to the leaching of salts from areas which have been under irrigation for different periods. Evidence should also be sought of any reduction of acidity in deep layers, as by the introduction of bicarbonate with water draining vertically from the carbonate horizons.

Another investigation associated with Murray Valley salinity was begun in 1974, with the aim of evaluating atmospheric circulation of salts in the Murray-Darling Drainage Division and determining whether movement of saline dust was contributing to salinity of river water. Sampling of rainfall for 28-day periods began in July 1974 at 27 stations in and near the drainage division. Determinations of chloride in rainwater indicate annual contributions varying from approximately 75 kg/ha at Mount Gambier, to 10 kg/ha at Merbein, and less than 1 kg/ha at Charleville. Collection of rain and dust samples will be continued for a longer period from July 1975 only in southern and drier parts of the drainage division.

Finally, emphasis was given to the close relationship between saline and sodic soil features in the region, the need to consider regional soil features in addition to those of particular problem areas, and the possible movement of salts from unirrigated to irrigated parts of the region.



