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SUMMARY OF PROCEEDINGS OF THE FIRST INTERNATIONAL CONGRESS OF PLANT PATHOLOGY

IMPERIAL COLLEGE OF SCIENCE AND TECHNOLOGY
LONDON S.W.7.

Sunday 14 July—Friday 26 July 1968

The first International Congress of Plant Pathology originated at a small, informal meeting of plant pathologists attending the Tenth International Congress of Botany at Edinburgh, 1964. A Steering Committee was formed to consider whether an independent Congress for plant pathology should be organized. Dr. S. D. Garrett, Chairman of the Plant Pathology Section of the Tenth International Congress of Botany, became Chairman of this Committee; other Members were Professor C. J. Hickman (Canada), Professor B. Boullard (France), Dr. K. H. Domsch (W. Germany), Professor T. S. Sadasivan (India), Professor A. J. P. Oort (Netherlands), Professor H. Kern (Switzerland), Professor K. F. Baker, Dr. J. G. Horsfall, Professor W. C. Snyder (U.S.A.), Sir Frederick Bawden, Professor P. W. Brian, Professor N. A. Burges, Dr. P. H. Gregory, Professor J. L. Harley, Dr. I. Isaac, and Professor R. K. S. Wood (United Kingdom).

Members of the Steering Committee met on 16 November 1964, and after considering advice given to Dr. S. D. Garrett by Sir George Taylor, Chairman of the Board of the Division of Botany, International Congress of Scientific Unions, resolved to organize on their own initiative an International Congress of Plant Pathology to be held in the United Kingdom; also to collaborate with other pathologists in the U.K. and other countries in the formation of an International Association or Society of Plant Pathologists which later would apply for affiliation to the International Union of Biological Sciences.

An Executive Committee was formed to implement these resolutions; the first Members were the U.K. Members of the Steering Committee.

Dr. S. D. Garrett was elected Chairman and Professor R. K. S. Wood was elected Secretary of the Executive Committee. Later, Dr. B. E. J. Wheeler was appointed Treasurer and Assistant Secretary and a number of other Members were appointed, two as representatives of the Association of Applied Biologists and the British Mycological Society.

Members of the Steering Committee other than those from the U.K. became the first Members of the Advisory Committee for the Congress. Many others were appointed later, usually after nomination by national or regional societies for plant pathology. The Executive Committee resolved that the main function of the Advisory Committee would be to advise on matters of principle and policy.

During the period leading up to the First Congress, Members of the Advisory Committee received summaries of minutes of meetings of the Executive Committee and were consulted on a number of important matters particularly in connection with the establishment of an International Association.

The Executive Committee first met on 8 June 1965, when it ratified a provisional decision, made on 16 November 1964, to hold the First Congress at Imperial College in July 1968; it met later at approximately six-monthly intervals.

The President and Vice-Presidents of the Congress and the final Membership of both Committees are listed below.

PRESIDENT	SIR FREDERICK BAWDEN
VICE-PRESIDENTS	Dr. A. A. Bitancourt
	Dr. B. d'Oliveira
	Professor T. S. Sadasivan
	Dr. Alice Săvulescu
	Professor W. C. Snyder
	Professor I. Uritani

EXECUTIVE COMMITTEE

Chairman	Dr. S. D. Garrett, Botany School, Downing Street, Cambridge.
Secretary	Professor R. K. S. Wood, Imperial College, London S.W.7.
Treasurer and Assistant Secretary	Dr. B. E. J. Wheeler, Imperial College, Silwood Park, Sunninghill, Berks.
Dr. G. C. Ainsworth	Dr. P. H. Gregory
Sir Frederick Bawden	Professor J. L. Harley
Professor P. W. Brian	Dr. I. Isaac
Dr. N. A. Burges	Dr. D. Rudd Jones
Dr. C. H. Cadman	Dr. F. T. Last
Dr. J. E. Crosse	Dr. R. C. F. Macer
Dr. E. Evans	Dr. H. Owen

ADVISORY COMMITTEE

Argentina	Ing. Agr. G. Bordelois
Australia	Prof. N. T. Flentje
Belgium	Prof. J. A. Meyer
Brazil	Dr. A. A. Bitancourt
Canada	Prof. C. J. Hickman
,,	Dr. R. A. Ludwig
,,	Dr. B. H. MacNeill
Ceylon	Dr. D. V. W. Abeygunawardena
Chile	Dr. M. Caglevic
Colombia	Dr. G. L. Galvez
Czechoslovakia	Prof. C. Blattný
Denmark	Dr. E. Hellmers
Eire	Prof. J. B. Loughnane
France	Prof. B. Boullard
,,	Dr. H. Darpoux
,,	Dr. P. Joly
,,	Prof. G. Viennot-Bourgin
German Democratic Republic	Prof. M. Klinkowski
German Federal Republic	Prof. H. Braun
,, ,, ,,	Dr. K. H. Domsch
Hungary	Dr. G. L. Farkas
India	Dr. S. P. Raychaudhuri
,,	Prof. T. S. Sadasivan
Israel	Dr. Z. Volcani
Italy	Prof. E. Castellani
,,	Prof. A. Ciccarone
Japan	Prof. S. Akai
,,	Prof. Z. Hidaka
,,	Prof. I. Uritani
Mexico	Prof. J. Galindo-Alonso
Netherlands	Prof. A. J. P. Oort
New Zealand	Prof. F. J. Newhook
Pakistan	Dr. A. Hafiz
Peru	Mrs. Consuelo Bazán de Segura
Poland	Prof. J. Kochman
Portugal	Dr. B. d'Oliveira
Rumania	Dr. A. Săvulescu
South Africa	Dr. J. E. Van der Plank
Spain	Dr. J. Salazar
Sudan	Prof. M. A. Nour
Sweden	Dr. D. Lihnell
Switzerland	Prof. H. Kern
U.S.S.R.	Prof. M. S. Dunin
,,	Prof. L. A. Kanchaveli
,,	Prof. M. K. Khokhryakov
,,	Prof. I. M. Polyakov

United Arab Republic	Prof. M. K. Tólba
U.S.A.	Prof. K. F. Baker
,,	Dr. J. G. Horsfall
,,	Prof. A. Kelman
,,	Dr. G. L. McNew
,,	Prof. G. S. Pound
,,	Prof. A. F. Ross
,,	Prof. R. D. Schein
,,	Prof. W. C. Snyder
,,	Prof. R. Young
,,	Dr. W. J. Zaumeyer
Yugoslavia	Prof. M. Josifović

OPENING CEREMONY

The Congress was opened at 11.00 on 15 July 1968 by LORD BLACKETT, O.M., C.H., PRESIDENT OF THE ROYAL SOCIETY.

FIRST PLENARY SESSION

This was held immediately after the Opening Ceremony on 15 July 1968. After an address of welcome from the President and announcements about the Congress, Dr. W. D. McClellan (Crops Research Division, U.S.D.A., Beltsville, Maryland 20705, U.S.A.), Chairman of the American Phytopathological Society Committee for the International Biological Programme, spoke on the aims and work of this Committee, particularly in relation to the origins and sources of new plant pathogens, measurment and distribution of biologically significant materials in the atmosphere, and the assessment of world losses caused by plant diseases. Meetings in which these matters were discussed during the Congress are referred to below.

SECOND PLENARY SESSION

The Second Plenary Session was held on 26 July 1968; about 400 Members of the Congress attended. The main purpose of the meeting was the founding of the International Association for Plant Pathology along lines proposed in an announcement which appeared in the Final Circular of the Congress. This is reproduced below.

Extract from Final Circular

INTERNATIONAL ASSOCIATION FOR PLANT PATHOLOGY

The Executive Committee and the Advisory Committee (hereinafter called the "Joint Committee") are preparing to launch the International Association for Plant Pathology during the period of the Congress. The primary function of this Association will be, in the first place, to provide machinery for arranging subsequent International Congresses. Arrangements are proceeding for affiliation of our International Association to the Division of Botany of the International Union of Biological Sciences.

A copy of the draft Constitution for the Association, which has been prepared and agreed by the Executive and Advisory Committees, follows this notice. You will see that Article 4 of the Constitution provides for a Council of officers and other members. Members of the Congress Advisory Committee have been asked to provide for nomination of members for the Association's Council from their own countries, if possible through the body that nationally represents plant pathology. But individual members of the Congress will be permitted to send in their own nominations for officers and/or members of the Association's Council; such nominations should be sent to a member of the Advisory Committee in the country concerned, so as to reach him not later than 15 April, 1968. All nominations must be accompanied by written consent of the nominee to serve on the Council if elected.

All nominations for officers and members of the Association's Council will be considered at a meeting of the Joint Committee early in the Congress. The Committee's list of officers and members of the Council will then have to be approved at the Second Plenary Session of the Congress on Friday 26 July.

SUGGESTED CONSTITUTION FOR
PROPOSED INTERNATIONAL ASSOCIATION FOR PLANT PATHOLOGY

1. The Association shall be called the International Association for Plant Pathology. By the term Plant Pathology shall be understood the comparative study of the plant and of plant populations in health and in disease, in all its fundamental, as well as in its applied aspects. This study shall thus include but shall be wider than that known as "Plant Protection".
2. The object of the Association shall be to promote the development of Plant Pathology and to facilitate international co-operation towards this end.
3. The primary function of the Association shall be to promote and organize the holding of International Congresses of Plant Pathology.
4. The general policy of the Association shall be controlled by a Council, consisting of a President, Vice-President, Secretary and Treasurer, together with not more than 25 other members. The Council and its officers shall be elected by members of the Association, either by ballot during the holding of a Congress, or by postal ballot as soon as possible after the holding of a Congress. The existing Council and officers shall not be eligible for immediate re-election.
5. The organization of each Congress shall be in the hands of an Executive Committee, which shall consist of a Chairman, Vice-Chairman, Secretary, Assistant Secretary, Treasurer and Assistant Treasurer, together with two other members. The Committee shall have power to co-opt further members. The Committee shall be elected at a meeting of members of the Association during a Congress; if the number of nominations exceeds the number to be elected, then the Secretary of the existing Executive Committee shall arrange for a ballot to be held. The term of service for members of the Executive Committee shall run from the end of one Congress to the end of the next; only those members of the Association who are nationals of the country in which the next Congress is to be held shall be eligible for election to the Committee.
6. Members of the Association shall be required to pay a regular subscription, the amount and the intervals of payment being determined by the Council.
7. Amendments to the Constitution may be proposed in writing by not less than five members of the Association acting conjointly. Proposed amendments approved by a majority of the Council shall be submitted to the members for a postal ballot. Adoption shall require a majority of two-thirds of the votes returned.
8. Responsibility for promoting formation of the International Association for Plant Pathology shall be undertaken by the Executive Committee for the First International Congress of Plant Pathology, assisted by its Advisory Committee.

End of extract

The President reported that 53 Members of the Joint Committee had met on 20 July 1968 and had made certain provisional decisions which would be implemented on the establishment of the International Association. At the request of the President, Dr. S. D. Garrett proposed that the International Association for Plant Pathology be established on the basis of the proposals in the Final Circular of the Congress. The proposal was seconded by Professor W. C. Snyder and carried *nemine contradicente*.

The Secretary of the Congress then reported as follows.

I. That the Joint Committee had considered nominations for Membership of the Council of the International Association. No ballot had been necessary and the following had been appointed to the first Council.

Australia	Prof. N. T. Flentje	Israel	Prof. I. Wahl
Belgium	Prof. J. A. Meyer	Italy	Prof. A. Graniti
Canada	Dr. B. H. MacNeill	Japan	Prof. S. Akai
Eire	Prof. J. B. Loughnane	,,	Prof. H. Asuyama
Finland	Prof. E. A. Jamalainen	,,	Prof. I. Uritani
France	Prof. G. Viennot-Bourgin	Netherlands	Dr. J. G. ten Houten
,,	Dr. M. Ridé	New Zealand	Prof. F. J. Newhook
German Democratic Republic	Prof. M. Klinkowski	Rumania	Dr. Alice Săvulescu
		,,	Prof. E. Rădulescu
German Federal Republic	Prof. H. C. Weltzien	,,	Prof. C. Sandu-Ville
		South Africa	Dr. P. S. Knox-Davies
		Sweden	Prof. Karl Björling
India	Dr. S. P. Raychaudhuri	United Kingdom	Dr. B. D. Harrison

United Kingdom	Prof. R. K. S. Wood	U.S.A.	Prof. A. Kelman
U.S.A.	Prof. A. W. Dimock	"	Prof. J. B. Kendrick
"	Dr. A. E. Dimond	"	Dr. H. Rex Thomas

II. That Council had met on 26 July 1968 and had appointed the following Officers:

President:	Professor R. K. S. Wood, Botany Department, Imperial College, London S.W.7, U.K.
Vice-President:	Professor A. Kelman, Department of Plant Pathology, University of Wisconsin, Madison, Wisconsin 53706, U.S.A.
Secretary:	Dr. J. G. ten Houten, Director, Institute for Phytopathological Research, Binnenhaven 12, Wageningen, Netherlands.
Treasurer:	Dr. S. P. Raychaudhuri, Division of Mycology and Plant Pathology, Indian Agricultural Research Institute, New Delhi 12, India.

III. That Council would reconsider the constitution of the International Association as given in the Final Circular and, if necessary, submit a revised version to the Second Congress for ratification.

IV. That Council had considered provisional offers from six countries to be hosts for the Second Congress; after a ballot had been held it was decided that the Second Congress would be held in Denmark, Netherlands, or U.S.A., and that the final choice would be announced in the scientific press.

The Second Plenary Session ended with votes of thanks proposed by the President, seconded by Professor N. T. Flentje, to all who had been concerned with the organization and running of the Congress and, in particular, to the Chairman, Secretary, Treasurer of the Executive Committee, to Dr. H. Owen, and also the Rector and Governing Body of Imperial College. These were endorsed with acclamation.

The President then formally closed the First International Congress of Plant Pathology.

There now follows an account of the Congress.

MEMBERSHIP OF THE CONGRESS

Below are shown the numbers of members from different countries; in addition, about 250 wives attended.

Angola	2	Honduras	2
Argentina	7	Hong Kong	4
Australia	21	Hungary	4
Austria	1	India	15
Belgium	11	Iran	1
Bermuda	1	Iraq	1
Bolivia	2	Ireland	16
Brazil	3	Israel	12
Bulgaria	1	Italy	35
Canada	45	Ivory Coast	1
Ceylon	1	Jamaica	3
Colombia	1	Japan	14
Cyprus	1	Jordan	1
Czechoslovakia	12	Kenya	6
Denmark	31	Lebanon	2
Finland	2	Libya	3
France	27	Malagasy	1
German Democratic Republic	6	Malawi	2
German Federal Republic	46	Malaysia	2
Ghana	1	Malta	1
Greece	8	Mauritius	1

Mexico	4	Spain	5
Netherlands	49	St Lucia	1
New Zealand	7	Sudan	5
Nigeria	6	Sweden	15
Norway	8	Switzerland	16
Pakistan	1	Thailand	1
Papua & New Guinea	1	Trinidad	5
Peru	2	Uganda	3
Philippines	2	United Kingdom	417
Poland	5	U.S.A.	223
Portugal	13	U.S.S.R.	29
Puerto Rico	1	Venezuela	2
Rhodesia	5	Yugoslavia	19
Rumania	4	Zambia	1
South Africa	9		

TOTAL: 1216

EVENING DISCOURSE

Dr. J. G. HARRAR, PRESIDENT OF THE ROCKEFELLER FOUNDATION, gave an Evening Discourse on 16 July on "PLANT PATHOLOGY AND WORLD FOOD PROBLEMS". This will be published separately by the Rockefeller Foundation.

DISCUSSION GROUPS

A series of very successful and well attended evening meetings, starting at 20.00, were held on 19 and 24 July. The subjects discussed at these meetings and the names of those who organized them are listed below.

1. Dr. W. J. Byford	Problems in controlling downy mildews
2. Prof. R. N. Goodman	Fireblight
3. Prof. R. J. Green	Concepts of resident instruction in plant pathology (Speakers: G. A. Gries, J. E. Knutz, J. Rishbeth, D. A. Roberts, B. E. J. Wheeler)
4. Mr. N. V. Hardwick	Electron microscopy and plant pathology
5. Dr. B. D. Harrison	Virus nomenclature
6. Prof. F. W. Holmes	Phytopathological translations
7. Mr. T. F. Preece	Leaf surface phenomena and infection
8. Dr. F. J. Schwinn Prof. G. A. Zentmyer	Current problems in the genus *Phytophthora* (2 meetings)
9. Prof. L. Sequeira	Bacterial diseases of tropical crops
10. Prof. A. F. Sherf	Problems of communication in plant pathology (Speakers: F. Hejndorf, A. Jensen, J. E. E. Jenkins, E. Lester, F. Joan Moore, A. O. Paulus, E. G. Sharvelle, A. F. Sherf, A. G. Walker, J. B. Wilson)
11. Dr. P. W. Talboys	Terminology in international plant pathology
12. Dr. W. J. Zaumeyer	The role of plant pathology in the developing countries of the world (Speakers: J. L. Apple, R. H. Fulton, T. H. King, E. C. Stakman, H. Rex Thomas, H. D. Thurston, W. J. Zaumeyer)

INTERNATIONAL BIOLOGICAL PROGRAMME

The account of the activities of the Committee of the American Phytopathological Society (APS) for the International Biological Programme (IBP), given by Dr. W. D. McClellan at the First Plenary Session, led to much discussion at a number of informal meetings held during the Congress, particularly on aerobiology. Summaries of these meetings given below are based on information supplied by Dr. McClellan.

On 15 July, Dr. P. H. Gregory convened a meeting to discuss aerial dispersal of spores, pollen, and other particulate material in relation to IBP. This was attended by Dr. H. A. W. Southon, Executive Secretary, IBP, London, Dr. A. W. Franklin, Wright Fleming Institute, London, Secretary-General of the International Allergenists, Dr. P. M. A. Bourke, Dr. L. Calpouzos, Dr. R. Davis, Dr. J. M. Hirst, Dr. W. D. McClellan, and Professor R. D. Schein. Later, Dr. P. H. Gregory, through the British Committee for IBP, recommended to the International Committee for IBP (SCIBP) the establishment of an Aerobiology Programme similar to that in the U.S.A.; this recommendation was accepted.

On 17 July, a general meeting discussed the U.S. Aerobiology Programme, accounts of which had been circulated to all Members of the Congress, and work on the assessment of plant disease losses being done by the APS and FAO.

On 24 July, Dr. W. S. Benninghoff and Dr. W. D. McClellan met Dr. H. A. W. Southon at the Central Office of IBP and agreed to the establishment of a working group (see below) to formulate an international aerobiology programme to be submitted to SCIBP for inclusion in the international programme: Dr. W. S. Benninghoff (U.S.A.), Dr. A. W. Franklin (U.K.), Dr. P. H. Gregory (U.K.), Dr. J. G. ten Houten (Netherlands), Dr. I. Palti (Israel).

During the Congress a number of other meetings discussed topics related to the interests of IBP, more particularly the effect of air pollutants on plants, diseases caused by species of *Fusarium* and *Phytophthora* and by bacteria, plant disease losses, and research on the centres of origin of plant pathogens.

SEED PATHOLOGY

A demonstration on seed pathology was staged by the U.K. Central Office of Information illustrating, among other items, the subjects studied at a Workshop organized by Dr. Mary Noble under the aegis of the International Seed Testing Association's Committee on Plant Diseases, Chairman Dr. P. Neergaard, Denmark.

EXHIBIT BY THE NATIONAL AGRICULTURAL ADVISORY SERVICE (N.A.A.S.)

An extensive exhibit organized by Dr. R. E. Taylor illustrated the general organization and activities of the agricultural extension service and its network of experimental centres in England and Wales. Special emphasis was placed on the role of plant pathology in the service, and a series of individual exhibits represented distinct facets of current N.A.A.S. activities.

Disease assessment as a means of estimating the economic impact of crop diseases is a major activity of N.A.A.S. plant pathologists in collaboration with the Ministry's Plant Pathology Laboratory at Harpenden, and the example chosen was the effect of foliar diseases on barley. Aerial photography and investigations into take-all decline in cereals and arabis mosaic virus in strawberries afforded examples of the development of new techniques and of investigational work. Production of virus-free rhubarb and its commercial evaluation was an instance of collaborative work between an extension service and a research station (National Vegetable Research Station).

Exhibits dealing with communication methods included a standard display unit demonstrating a proven disease control measure (grey mould of strawberry), preservation of plant pathological material for demonstration and teaching purposes, advisory publications, colour transparencies of plant diseases, and a centralized information retrieval system based on feature cards. The national collection of colour transparencies of plant pathology subjects comprises some 1,000 slides, sets of which are distributed throughout the service. They are now being used for teaching and as aids to diagnosis by agricultural colleges and commercial organizations both in the United Kingdom and in many places abroad.

INTERNATIONAL WORKING GROUP ON LEGUME VIRUSES

The third meeting of the International Working Group on Legume Viruses was held on 26 July; it was arranged by Dr. L. Bos and Dr. Roger Hull. The morning session consisted of a symposium on viruses of the potato virus Y group, infectious to legumes under natural conditions, with special reference to their relationships to bean yellow mosaic virus. After an introduction by L. Bos, contributions were received from M. Conti and O. Lovisolo (Observations on a virus isolated from *Wisteria floribunda* in Italy), R. E. Ford (Electron microscopy of soybean mosaic virus compared with other viruses), R. Hull (A virus disease of garden lupins), and W. J. Kaiser (The importance of viruses in the cultivation of pulse crops in Iran).

In the afternoon session papers were read by A. J. H. Carr (Recent investigations on clover phyllody and other yellows-type viruses of clover), R. Cousin (A comparative study of the viruses of bean yellow mosaic and common pea mosaic), N. Hubbeling (Resistance in beans against bean common mosaic virus), B. A. Kvicala (Remarks on legume viruses in Cuba), S. Tolin (Virus diseases of peanuts in the U.S.A.), J. J. F. Vanderveken (Aphid transmission of bean yellow mosaic virus curtailed by oil), and W. J. Zaumeyer (A new virus disease of lima beans (*Phaseolus lunatus*)).

MEETING OF POTATO PATHOLOGISTS

The meeting on 15 July was arranged by Dr. D. H. Lapwood for potato pathologists to meet informally to discuss current potato problems. About 50 participants were expected but over 100 attended. A film " A crop of problems " lent by the Potato Marketing Board (who helped finance the meeting) preceded a short informal discussion led by Mr. E. Førsund (Chairman of the Pathology Section of the European Association for Potato Research).

INTERNATIONAL COMMITTEE FOR POLLUTION DAMAGE TO PLANTS (ICPDP)

A meeting held on 24 July was attended by 24 Members from Argentina, Canada, Czechoslovakia, France, Germany, Netherlands, Sweden, U..K, and U.S.A.

A proposal was put to the meeting by Professor F. A. Wood (University Park, U.S.A.), on behalf of the Pollution Damage Committee of the American Phytopathological Society, that an International Committee be formed; three members of the American Committee were present.

The proposal was supported by Dr. J. G. ten Houten (Wageningen, Netherlands), and Dr. G. Benninghoff (Ann Arbor, U.S.A.).

The primary aims of the ICPDP were defined by the meeting as:

1. registration of all interested workers in this field
2. exchange of information
3. closer co-operation between specialist groups
4. organization of meetings and symposia
5. definition of international problems

The meeting decided that because of the large amount of work done in the U.S.A. and because the American Phytopathological Society were prime movers in the formation of the ICPDP, senior officers should be from the U.S.A. and that deputy officers should be European, and as follows for the first term of office:

Chairman, Professor O. C. Taylor (Riverside, U.S.A.)
Vice-Chairman, Dr. R. Guderian (Essen, W. Germany)
Secretary, Professor F. A. Wood (University Park, U.S.A.)
Vice-Secretary, Dr. P. J. W. Saunders (Cambridge, U.K.)

The ICPDP is now operating and compiling its membership list. Interested parties not already in touch with the Committee should write as soon as possible to Dr. P. J. W. Saunders, N.I.A.B., Cambridge, U.K.

DEMONSTRATIONS

The following were displayed during the whole of the Congress:

1. Ultrastructure of infected plants—Professor P. H. Williams and Professor G. A. de Zoeten
2. Publications of the American Phytopathological Society—Professor A. F. Sherf
3. Literature exhibit, Extension Service Pathologists—Mr. W. Campbell
4. Scientific Equipment—Burkhard Scientific Sales Ltd., Fisons Scientific Apparatus Ltd., Gallenkamp & Co., Ltd., Shandon Scientific Co., Ltd., W. Watson and Sons Ltd.
5. Books and other publications—Dillons University Bookshop and Commonwealth Mycological Institute

EXCURSIONS

Three days of the Congress programme were set aside for visits to a number of research centres, mainly in the south of England, organized by Dr. H. Owen. The excursions were well attended, some heavily over-subscribed, and were very successful. Many members commented appreciatively on the quality of the exhibits and demonstrations which had been arranged for them. The Executive Committee is most

grateful to the Directors and staff of institutions for all their efforts, and to the research students and others who accompanied the excursion parties and helped to ensure that arrangements went smoothly.

The excursions, with numbers of members attending in brackets, and the names of those who acted as guides are listed below.

18 July

Ministry of Agriculture, Fisheries and Food, Plant Pathology Laboratory, Harpenden (39)
East Malling Research Station, Maidstone (40)
Glasshouse Crops Research Institute, Littlehampton (155)
Chesterford Park Research Station, Saffron Walden (Fisons Pest Control Ltd.) (29)
Woodstock Agricultural Research Centre, Sittingbourne (Shell Research Ltd) (25)
Murphy Chemical Co., Ltd. (Glaxo Group), Wheathampstead (43)

23 July

Botany School and Agricultural Research Council Virus Research Unit, Cambridge (78)
National Institute of Agricultural Botany and National Agricultural Advisory Service Cambridge (66)
Plant Breeding Institute, Cambridge (35)
Rothamsted Experimental Station, Harpenden (114)
Rothwell Plant Breeding Station, Lincoln (25)
Broom's Barn Experimental Station, Bury St Edmunds (29)
Ministry of Agriculture, Fisheries and Food, Plant Pathology Laboratory, Harpenden (35)
East Malling Research Station, Maidstone (39)
National Vegetable Research Station, Wellesbourne (28)

25 July

National Vegetable Research Station, Wellesbourne (36)
Long Ashton Research Station, Bristol (67)
Rothamsted Experimental Station, Harpenden (119)
National Agricultural Advisory Service, Reading, and Alice Holt Forest Research Station, Farnham (23)
Jealott's Hill Research Station, Bracknell (I.C.I. Ltd.) (54)

In addition, on the three excursion dates the Commonwealth Mycological Institute, Kew, held Open Days which were attended by many Members.

Guides

Mr. P. G. Ayres Dr. K. A. Balasubramanian, Mr. D. Farrant, Mr. N. V. Hardwick, Mrs. M. C. Heath, Mr. G. V. H. Jackson, Dr. R. C. F. Macer, Mr. T. H. Manning, Mr. P. C. Mercer, Mr. P. Merriman, Miss J. A. Moreton, Mr. T. V. Price, Dr. P. Rogers, Mr. C. Shillingford, Miss C. Skellern, Mr. R. A. Skipp, Miss B. M. Stanbridge, Miss P. Stholasuta, Mr. R. Stinton, Miss M. Thomas, Mr. L. E. Webb, Mr. R. J. Williams.

CONDUCTED TOURS

On Sunday 21 July 1968 large parties toured Hampton Court Palace, Windsor Castle and the Thames Valley, or Stratford-on-Avon and the Shakespeare countryside.

ARRANGEMENTS FOR WIVES

The programme for wives was organized by Lady Bawden and Mrs. Watson. It started with a Tea Party at Imperial College on 15 July, attended by Lady Blackett, at which Lady Bawden and Mrs Watson welcomed many wives to the Congress.

On the following day there were conducted coach tours of London so that visitors could get acquainted with the city. Thereafter, they made up their own parties to visit places of special interest.

Wives who accompanied their husbands on the Excursions to research centres were entertained and taken to places of local interest.

The organizers thank the many people who helped, particularly those in charge of arrangements at the research centres.

RECEPTIONS

The Imperial College Reception was held on 15 July. Guests were received by Lord Penney, Rector of Imperial College, and Lady Penney.

The University Reception was held on 17 July in the Senate House of the University of London. Guests were received by Professor C. T. Ingold acting for Professor Sir Owen Saunders, Vice-Chancellor of the University, who was prevented from attending by urgent Government business.

The Government Reception was held on 22 July in Lancaster House. Guests were received by Mr. Edward Short, Secretary of State for Education and Science.

The Reception for all Members of the Congress given by the Federation of British Plant Pathologists was held at Imperial College on 20 July. Guests were received by Professor J. Colhoun, Chairman, Federation of British Plant Pathologists, and Mrs. Colhoun, Professor L. Broadbent, President, Association of Applied Biologists and Mrs. Broadbent, by Dr. W. P. K. Findlay acting on behalf of Dr. J. G. Manners, President, British Mycological Society prevented from attending by an accident, and Mrs. Findlay, and by Sir Frederick Bawden, President of the Congress, and Lady Bawden. During the Reception, Professor Colhoun welcomed and made a Presentation to Emeritus Professor William Brown of Imperial College on behalf of the Federation of British Plant Pathologists.

CONVERSAZIONE

Current work in Plant Pathology in the United Kingdom was demonstrated in a Conversazione held on 20 July and organized for the Federation of British Plant Pathologists by Dr. G. F. Pegg.

The 85 exhibits, most of which occupied many feet of bench, provided the largest display of Plant Pathology ever to be held in the U.K. The Conversazione attracted a great deal of attention and was very well attended on the Saturday and during the following week.

GIFTS AND LOANS

The following gifts were received in response to an Appeal made by the Chairman, Dr. S. D. Garrett, on behalf of the Executive Committee.

The Royal Society	£500
Shell International Petroleum Co. Ltd.	£500
Imperial Chemical Industries Ltd.	£250
Rank, Hovis, McDougal Ltd.	£200
Rothwell Plant Breeders Ltd.	£200
Unilever Ltd.	£200
Boots Pure Drug Co. Ltd.	£100
Cyanamid of Great Britain Ltd.	£100
Fisons Pest Control Ltd.	£100
Imperial Tobacco Co. Ltd.	£100
Murphy Chemical Co. Ltd. (on behalf of the Glaxo Group)	£100
May and Baker Ltd.	£50

A loan of $2500 was received from the International Union of Biological Sciences; it was repaid a few weeks after the end of the Congress. Loans were generously offered by the Association of Applied Biologists and the British Mycological Society, but happily it was not found necessary to accept them.

The Executive Committee would like to emphasize that apart from the gifts and loans listed above no funds were available for the Congress until fees began to be received from Members early in 1968. By this time, arrangements for the Congress were almost complete. The Executive Committee wishes, therefore, to record its particular thanks to those who by gifts and loans made the First Congress possible.

ACKNOWLEDGEMENTS

The Executive Committee wishes to record its debt to the many who in various ways contributed so much to the success of the Congress, above all to the following:

The Rector and Governing body of Imperial College for placing so many of the College's facilities at the disposal of the Congress.

Professors J. Brown, C. J. Butler, H. Ford, A. W. Skempton, and C. P. Whittingham for use of their Departments.

The Wardens and Bursars for accommodation in Canterbury Hall, Commonwealth Hall, and International Hall of the University of London, and South Side of Imperial College.

Mr. D. Farrant, Mr. G. V. H. Jackson, Mr. T. V. Price and Miss B. M. Stanbridge for their services at Halls of Residence during the Congress.

Mr. C. C. Seaford, Domestic Bursar of Imperial College, Mrs. V. Schroter and Miss M. Head of his office for general help and advice before and during the Congress.

Mr. V. J. Mooney, Refectory Manager, Imperial College, for catering for lunches, receptions, and private functions.

Mr. R. Adams, Mr. R. W. Wells, Mr. F. G. C. Gunningham, Departmental Superintendents, and Mr. R. W. Thomas for technical and much other help.

Mrs. B. E. J. Wheeler for helping the Treasurer over many months before the Congress, and Mrs. H. Owen for helping Dr. H. Owen to organize the Excursions.

Mr. D. J. B. Copp, Secretary of the Institute of Biology, and his staff for secretarial and clerical work.

Mrs. A. Shergold and Mrs. J. Cheston who were responsible for a large part of the secretariat work particularly during 1968.

The Director of the Royal Geographical Society for allowing the Congress to use its Lecture Theatre and other rooms.

Lunn-Poly, Tourist and Travel Company for running conducted tours and assuming responsibility for entertainment and travel.

The National Provincial Bank, South Kensington, for providing banking facilities.

The Imperial College Health Centre for meeting the medical needs of Members of the Congress.

The Executive Committee also wishes to thank the Federation of British Plant Pathologists, the Association of Applied Biologists, the British Mycological Society, and many other national and regional societies for plant pathology for their interest in the Congress and the many ways in which they contributed to its success.

RECORDS OF THE CONGRESS

These are to be deposited in the Archives of Imperial College.

SYMPOSIA

The following were held during the Congress

PHYSIOLOGY AND BIOCHEMISTRY OF PARASITISM

Organized by PROFESSOR P. W. BRIAN, (Department of Botany, University of Glasgow, Glasgow, U.K., now Botany School, Downing Street, Cambridge, U.K.)

1. Growth responses and phytohormones in diseased plants.

Chairman: P. W. Brian (Glasgow, U.K.)

L. Sequeira (Madison, U.S.A.). Aromatic biosynthesis and hormonal imbalance in diseased plants.

K. W. Bailiss and I. M. Wilson (Aberystwyth, U.K.). Growth hormones and the thistle rust *Puccinia punctiformis* on *Cirsium arvense*.

K. Király (Budapest, Hungary). Role of cytokinins in biochemical and morphogenetic changes induced by rust infections.

J. A. Lippincott and B. B. Lippincott (Evanston, U.S.A.). Attachment of *Agrobacterium tumefaciens* to a specific host site as a step in the crown-gall tumour initiation process.

A. Săvulescu, L. Mesrobeaunu, A. Popescu and D. Movileaunu (Bucharest, Rumania). Tumour-inducing action of *Agrobacterium tumefaciens* endotoxin on *Datura stramonium*.

H. Borecka and J. Pieniazek (Skierniwice, Poland). Synthetic abscisic acid and natural abscisic acid extracted from fleshy fruits as factors stimulating the germination of spores of pathogenic fungi.

2. Miscellaneous papers: physiology and biochemistry of parasitism.

Chairman: J. H. Western (Leeds, U.K.)

A. L. Schipper Jr. and C. J. Mirocha (St. Paul, U.S.A.). β-Amylase inhibitors in rust uredospores.

S. S. Patil and A. E. Dimond (New Haven, U.S.A.). Regulation of pectic enzyme synthesis in wilt pathogens, *Fusarium oxysporum* f, *lycopersici* and *Verticillium albo-atrum*.

E. W. B. Ward and J. B. Lebeau (London and Lethbridge, Canada). Hydrogen cyanide: production by fungi and activity as a toxin in pathogenesis.

J. H. M. Temmink and R. N. Campbell (Davis U.S.A.). Ultrastructure of infection by *Olpidium brassicae*.

O. L. Ozeretskovskaya, O. N. Savel'eva, N. I. Vasyukova and E. V. Morozova (Moscow, U.S.S.R.). Wound reactions and their role in plant immunity.

3. Enzymology of tissue breakdown

Chairman: T. S. Sadasivan (Madras, India)

R. K. S. Wood (London, U.K.). Tissue breakdown: the scope of the problem for the pathologist and the biochemist.

J. H. McClendon (Lincoln. U.S.A.). The effect of some enzymes on the physical properties of pectins.

R. J. W. Byrde, A. H. Fielding and F. D. Calonge (Long Ashton, U.K.). Some effects of extracellular enzymes on fine structure.

T. Swinburne (Belfast, U.K.). The interrelationship of polygalacturonases with distinct properties produced *in vitro* and *in vivo* by *Penicillium expansum*.

P. Albersheim, P. D. English, W. Richman and D. J. Nevins (Boulder, U.S.A.). A consideration of the relationship between cell-wall polysaccharide biosynthesis and disease resistance.

E. B. Cowling, T. K. Kirk and W. Brown (Raleigh, U.S.A.). Enzymatic effects of wood-destroying fungi on lignin.

4. Role of toxins in pathogenesis.

Chairman: R. P. Scheffer (East Lansing, U.S.A.)

R. B. Pringle (Ottawa, Canada). Host-specific toxins as primary determinants of disease.

W. G. Keyworth (Wellesbourne, U.K.). Effects of *Fusarium* culture filtrates on susceptible and resistant tomatoes.

A. E. Dimond (New Haven, U.S.A.). Causes of dysfunction in water transport in wilt diseases.

R. C. Hignett and D. S. Kirkham (East Malling, U.K.). Interactions between *Venturia inaequalis* and apple leaf tissue.

S. S. Woltz (Bradenton, U.S.A.). Role of microbially synthesised antimetabolites of amino acids in the production of yellow strapleaf and related disorders.

G. A. Strobel (Bozeman, U.S.A.). Chemical and biological properties of a phytotoxic polysaccharide produced by *Corynebacterium sepedonicum*.

5. Chemically based disease resistance (1).

Chairman: B. A. Rubin (Moscow, U.S.S.R.)

I. A. M. Cruickshank (Canberra, Australia). Fungal metabolites as phytoalexin-inducing agents.

B. J. Deverall (London, U. K.). The role of phytoalexins in some fungal diseases of beans.

D. M. Spencer and C. H. Fawcett (Wye, U.K.). Some aspects of the response of apple fruits to infection with *Sclerotinia fructigena*.

J. Nüesch (Basel, Switzerland). Induced chemical factors of resistance against fungal invasion in orchids (presented by Professor H. Kern).

Y. Asada (Matsuyama, Japan). Growth of *Peronospora parasitica* on excised sections of Japanese radish and the formation of lignin-like substances in the infected tissues.

6. Chemically based disease resistance (2).

Chairman: I. A. M. Cruickshank (Canberra, Australia).

J. Kuć (Lafayette, U.S.A.). Multiple inhibitors and biochemical mechanisms for disease resistance in a host.

I. Uritani (Nagoya, Japan). Biochemical sequences in defence action.

B. A. Rubin (Moscow, U.S.S.R.). Biochemical mechanisms of plant defence reactions.

L. D. Hunter and D. S. Kirkham (East Malling, U.K.). Active resistance of apples to scab.

L. V. Metlitskiĭ, V. E. Sokolova, E. G. Salkova and N. P. Korableva (Moscow, U.S.S.R.). Antibiotic substances of plants and their role in plant immunity.

A. J. Pappelis and J. N. BeMiller (Carbondale, U.S.A.). Compounds of maize stalk tissue that inhibit germination, enzyme synthesis and growth of *Diplodia zeae*.

7. Obligate parasitism (1).

Chairman: C. E. Yarwood (Berkeley, U.S.A.).

P. J. Allen (Madison, U.S.A.). Factors controlling germination and differentiation of uredospore germ-tubes in rust fungi.

R. C. Staples and L. Ramakrishnan (Yonkers, U.S.A.). Protein synthesis by germinating uredospores of the bean rust fungus.

K. J. Scott (Sydney, Australia). The initiation of saprophytic growth of *Puccinia graminis*.

A. H. Ellingboe (Seattle, U.S.A.). Spore germination and primary infection by *Erysiphe*.

C. K. Chou (Leeds, U. K.). An electron microscope study of host penetration and early stages of haustorium formation by *Peronospora parasitica*.

D. D. Clarke and L. J. R. Milne (Glasgow, U.K.). Physiology of sporeling growth in *Phytophthora infestans*.

8. Obligate parasitism (2)

Chairman: N. F. Robertson (Hull, U.K.).

M. J. Griffin and J. R. Coley-Smith (Hull, U.K.). The establishment of hop tissue cultures and their infection by downy mildew, *Pseudoperonospora humuli*, under aseptic conditions.

D. S. Ingram (Glasgow, U. K.). Growth of *Plasmodiophora brassicae* in tissue culture.

M. Cox (Glasgow, U.K.). Fine structure of *Plasmodiophora brassicae*.

W. R. Bushnell (St. Paul, U.S.A.). Development of *Erysiphe graminis* on intact and partly dissected cells of isolated host epidermis.

O. Majernik (Nitra, Czechoslovakia). Comparative study of barley varieties in relation to resistance to *Erysiphe graminis*.

9. Biochemistry of pathogenesis (1).

Chairman: L. B. Thrower (Hong Kong).

M. Shaw (Vancouver, Canada). Some effects of rust infection on nuclei and nucleic acids in host tissue.

J. M. Daly (Lincoln, U.S.A.). Mechanisms of accumulation and metabolism of carbon compounds during pathogenesis.

J. G. Manners (Southampton, U.K.). The mechanism by which obligate parasites affect the movement of nutrients in their hosts.

P. H. Williams and N. T. Keen (Madison, U.S.A.). Host-parasite interaction of *Plasmodiophora brassicae* in cabbage.

C. Paulech and E. Haspel-Horvatovic (Bratislava, Czechoslovakia). The effect of *Erysiphe graminis* on photosynthesis, water content and assimilatory pigments of infected plants.

D. H. Lewis (Sheffield, U.K.). Carbohydrate metabolism in symbiotic and parasitic associations of green plants and fungi.

10. Biochemistry of pathogenesis (2).

Chairman: M. Shaw (Vancouver, Canada).

R. Heitefuss (Göttingen, W. Germany). Nucleotide and nucleic acid metabolism in rust-infected plants.

M. A. Stahmann (Madison, U.S.A.). The role of enzymes and ethylene in host-pathogen interactions and resistance.

G. L. Farkas (Budapest, Hungary). Accelerated senescence as a major aspect of metabolic alterations in the diseased plant.

T. S. Sadasivan (Madras, India). Osmo-regulation in pathogenesis.

A. Graniti (Bari, Italy). Host-parasite relations in olive leaves infected by the leaf-spot fungus *Spilocea oleagina*.

J. G. Hancock (Berkeley, U.S.A.). Alterations of respiration, cell permeability and free-space in squash hypocotyls during pathogenesis by *Hypomyces solani* f.sp. *cucurbitae*.

FUNGICIDES: THEIR DISCOVERY, USE AND MODE OF ACTION

Organized by Dr. R. J. W. Byrde (Research Station, Long Ashton, Bristol, U.K.), helped by Dr. K. J. Bent (Bracknell, U.K.), Dr. L. Calpouzos (St. Paul, U.S.A.) and Dr. J. Dekker (Wageningen, Netherlands).

1. Fungicide selection.
Chairman: R. L. Wain (Wye, U.K.), who introduced the Symposium.
R. J. Lukens (New Haven, U.S.A.). Structure activity relationships of heterocyclic fungicides.
D. Woodcock (Long Ashton, U.K.). Structure activity relationships in aromatic fungicides.
K. Fukunaga (Tokyo, Japan). Antibiotics as fungicides (presented by H. Asuyama).
L. Ferenczy, J. Zsolt, F. Kevei, A. Haznagy, L. Toth, K. Szendrei, S. Foldeak, K. Novaks (Szeged, Hungary). Demethoxytylophorine, a highly active antifungal antibiotic of plant origin.
J. G. Horsfall (New Haven, U.S.A.) opened the Discussion.

2. Methods of testing fungicides.
Chairman: S. E. A. McCallan (Yonkers, U.S.A.).
Introducer: A. Tempel (s'Graveland, Netherlands). Objectives in fungicide testing.
D. Neely (Urbana, U.S.A.). The value of *in vitro* tests.
C. Zaracovitis (Athens, Greece). Testing fungicides against powdery mildews.
S. Lust (Darmstadt, W. Germany). A new laboratory method for testing the efficiency of fungicides.
E. L. Frick (East Malling, U.K.). Methods of testing fungicides *in vivo* under greenhouse conditions with special reference to the powdery mildews.
D. C. Erwin (Riverside, U.S.A.). Testing systemic fungicides.
The Chairman opened the Discussion.

3. Factors affecting field performance of foliage fungicides.
Chairman: G. S. Hartley (Saffron Walden, U.K.).
Introducer: E. Evans (Saffron Walden, U.K.). Efficient timing of foliar fungicide applications.
R. H. Fulton (New York, U.S.A. and Recife, Brazil). Application: low and high volume spraying.
J. M. Hamilton (Geneva, U. S. A.). Redistribution of fungicides on apple leaves.
K. J. Bent and J. M. Winchester (Bracknell, U.K.). The influence of formulation on fungicide performance.
J. T. Martin (Long Ashton, U.K.) opened the Discussion.

4. Fungicides for plantation crops.
Chairman: G. Ordish (London, U.K.) who introduced the Symposium, with special reference to the economics of fungicide usage.
C. S. Venkata Ram (Cinchona Post, India). Developments in spraying technique and usage of fungicides against diseases of tea.
E. Griffiths and B. H. Vine (Ruiru, Kenya). Fungicides for control of coffee berry disease in Kenya.
R. L. Wastie and K. H. Chee (Kuala Lumpur, Malaysia). Problems in the chemical control of diseases of Hevea rubber in Malaysia.
J. Cuillé and Mme. L. Bur-Ravault (Paris, France). Le traitement des fruits tropicaux avant l'emballage.
W. F. T. Hartill (Salisbury, Rhodesia). The distribution of fungal spores and spray deposits on field tobacco.
F. J. Nutman (Nairobi, Kenya) opened the Discussion.

5. Fungicides for annual crops.
Chairman: E. Lester (Reading, U.K.).
J. B. Rowell (St. Paul, U.S.A.). Chemical control of rust on cereals.
W. S. Catling, I. K. Cook, R. W. McWilliam and A. Rhodes (Wheathampstead, U.K.). Bis-(8-guanidinoctyl)amine sulphate, a new broad spectrum fungicide especially effective against seed-borne diseases of cereals.
D. V. W. Abeygunawardena (Peradeniya, Ceylon). Fungicidal control of rice diseases (read in his absence).
W. F. Crosier (Geneva, U.S.A.). Seed dressings for annual crops.
M. Claire Shephard (Bracknell, U.K.). Control of cucurbit powdery mildews with a new systemic fungicide.
D. Rudd Jones (London, U.K.) opened the Discussion.

6. Fungicides for fruit crops.
Chairman: H. Martin (London, U.K.).
A. H. M. Kirby (East Malling, U.K.). Field performance of fungicides: top fruit.
Fran E. Fisher (Lake Alfred, U.S.A.). Fungicides and their use on citrus.

J. W. Eckert (Riverside, U.S.A.). Chemical treatments for control of post-harvest diseases.
A. T. K. Corke (Long Ashton, U.K.). Fungicides for soft fruit.
C. J. Delp and H. L. Klopping (Wilmington, U.S.A.). Disease control with Du Pont Fungicide 1991.
J. Cartwright (U.K.) opened the Discussion.

7. Mechanisms of fungitoxicity and selectivity.
Chairman: J. G. Horsfall (New Haven, U.S.A.).
Introducer: E. Somers (Ottawa, Canada). Fungicide selectivity and specificity.
Z. E. Bekker (Ashkhabad, U.S.S.R.) Mechanisms of fungicidal action of antibiotics and some fungicides.
T. Hirai (Nagoya, Japan). The mode of action of two antiviral antibiotics.
J. Dekker (Wageningen, Netherlands). Development of resistance to fungicides.
L. Calpouzos (St. Paul, U.S.A.). Oil as a fungicide.
H. Lyr (Berlin, German Democratic Republic). On the mechanism of action of δ-Hexachlorocyclohexane (Δ-HCH).
H. D. Sisler (College Park, U.S.A.) opened the Discussion.

8. Systemic fungicides, and future developments.
Chairman: A. E. Dimond (New Haven, U.S.A.).
Introducer: G. L. McNew (Yonkers, U.S.A.). An expanding concept on the use of chemicals to control plant diseases.
L. V. Edginton (Guelph, Canada). Translocation of systemic fungicides.
A. Kaars Sijpesteijn (Utrecht, Holland). Metabolism of fungicides in the host.
F. Grossmann (Giessen, W. Germany). Conferred resistance in the host.
J. B. Sinclair and A. I. Allam (Baton Rouge, U.S.A.). Systemic control of seed-borne diseases.
R. L. Wain (Wye, U.K.) opened the Discussion.

VIRUSES AND VIRUS DISEASES

Organized by Dr. C. H. CADMAN and Dr. B. D. HARRISON (Scottish Horticultural Research Institute, Invergowrie, Dundee, U.K.).

1. Groups of viruses as pathogens.
Chairman: J. Brandes (Braunschweig, W. Germany).
B. D. Harrison (Dundee, U.K.). Classification of plant viruses: methods and utility.
R. Bercks (Braunschweig, W. Germany). Potato virus X group.
R. J. Shepherd (Davis, U.S.A.). Viruses of the squash mosaic group.
C. Wetter (Saarbrücken, W. Germany). Serological similarities among viruses of the tobacco mosaic virus group.
A. J. Gibbs (Canberra, Australia). Problems of virus nomenclature.

2. Ultrastructure of virus-infected cells.
Chairman: M. Rubio Huertos (Madrid, Spain).
R. G. Milne (Harpenden, U.K.). A comparison of some fixation, embedding and staining techniques.
T. Shalla (Davis, U.S.A.). Effects of viruses on cellular components.
J. R. Edwardson (Gainesville, U.S.A.). Inclusion bodies.
E. Shikata (Sapporo, Japan). Localization and distribution of insect-borne plant-pathogenic viruses in their plant and insect hosts.
G. M. Razvyazkina, G. P. Polyakova, V. A. Stein-Margolina and N. E. Cherni (Moscow, U.S.S.R.). Electronmicroscopic studies of plant viruses in cells of plants and vectors.

3. Miscellaneous papers: viruses.
Chairman: C. H. Cadman (Dundee, U.K.).
R. E. F. Matthews (Auckland, New Zealand). Turnip yellow mosaic virus—a model virus system.
J. Semal (Gembloux, Belgium) and R. I. Hamilton (Montreal, Canada). Incorporation of H^3 UTP into double-stranded RNA by cell-free extracts from barley leaves infected with bromegrass mosaic virus.
L. Hirth (Strasbourg, France). Température et répartition des différents composants du virus de la mosaique de la luzerne.

Z. Hidaka and K. Ishikawa (Fukuoka, Japan). Initial multiplication of tobacco mosaic virus in inoculated leaves of tobacco and its regulation by a virus inhibitor.

A. Kozlowska (Krakow, Poland). Effect of factors affecting virus multiplication in resistant and susceptible tobacco varieties.

4. Relating biological properties to differences in virus particle structure.

Chairman: R. Markham (Norwich, U.K.).

H. G. Wittmann (Berlin-Dahlem, W. Germany). Tobacco mosaic virus mutants and strains.

L. van Vloten-Doting, J. Kruseman and E. M. J. Jaspars (Leiden, Netherlands). The biological function of the components of alfalfa mosaic virus.

R. M. Lister (Lafayette, U.S.A.). Defectiveness and dependence in tobacco rattle viruses.

A. van Kammen and L. J. L. D. van Griensven (Wageningen, Netherlands). The interrelationship of the nucleoprotein components of cowpea mosaic virus.

C. I. Kado (Davis, U.S.A.) and C. A. Knight (Berkeley, U.S.A.). Mapping of genes of tobacco mosaic virus.

5. Newly described viruses and their vectors.

Chairman: R. W. Fulton (Madison, U.S.A.).

S. P. Raychaudhuri and B. Ganguly (New Delhi, India). Virus diseases of large cardamom (*Amomum subulatum* Roxb.) in India.

K. Schmelzer (Aschersleben, German Democratic Republic). Elm mottle, an undescribed virus from woody plants.

R. R. Granados (Yonkers, U.S.A.). Transmission of corn stunt virus by *Graminella nigrifrons* and *Deltocephalus sonorus* and electron microscopy of leafhopper vectors.

R. A. C. Jones (Dundee, U.K.). Potato mop-top virus, and evidence for its transmission by *Spongospora subterranea*.

N. E. Grylls, N. A. Bor and P. Hunt (Kingston, Jamaica). An approach to the study of the aetiology of coconut lethal yellowing disease.

6. Mechanisms of transmission of viruses by vectors.

Chairman: L. M. Black (Urbana, U.S.A.).

L. M. Black (Urbana, U.S.A.). Introductory survey.

C. Hiruki (Edmonton, Canada). Persistence of plant viruses in fungi and their transmission, with special reference to tobacco stunt virus.

T. P. Pirone (Lexington, U.S.A.). Specificity of transmission of stylet-borne viruses.

R. C. Sinha (Ottawa, Canada). Mechanism of persistence of wound tumor virus in its vector.

H. Asuyama (Tokyo, Japan). *Mycoplasma*-like organisms as causes of plant diseases.

K. Maramorosch and R. R. Granados (Yonkers, U.S.A.). Leaf hopper transmission of *Mycoplasma*, suspected aetiologic agents of yellows-type diseases.

7. Wild plants in the ecology of crop viruses.

Chairman: M. Klinkowski (Aschersleben, German Democratic Republic).

C. E. Taylor (Dundee, U.K.). Wild plants as sources of insect and nematode vectors.

A. F. Murant (Dundee, U.K.). Wild plants in the ecology of NEPO viruses.

V. Valenta (Bratislava, Czechoslovakia). Aster yellows-type viruses in Europe.

J. E. Duffus (Salinas, U.S.A.). Beet yellowing viruses in the U.S.A.

L. L. Stubbs (Burnley, Australia). Lettuce necrotic yellows virus.

8. Resistance to virus diseases.

Chairman: J. P. H. van der Want (Wageningen, Netherlands).

J. G. Atabekov, V. K. Vishnichenko, V. K. Novikov, N. A. Kiselev and A. S. Kaftanova (Moscow, U.S.S.R.). Possible mechanisms controlling the host range of plant viruses.

H. Ross (Köln-Vogelsang, W. Germany). Genetical aspects of resistance to virus diseases.

F. Solymosy (Budapest, Hungary). Cellular aspects of resistance to plant virus diseases.

A. F. Posnette (East Malling, U.K.). Tolerance of virus infection.

9. Epidemiology of viruses.
Chairman: M. A. Watson, (Harpenden, U.K.).
J. M. Thresh (East Malling, U.K.). Patterns of virus spread.
M. A. Nour and J. J. Nour (Khartoum, Sudan). Cotton leaf curl and allied viruses.
A. S. Rao (Tirupati, India) and M. K. Brakke (Lincoln, U.S.A.). Epidemiology of soil-borne wheat mosaic virus.
A. J. Cockbain (Harpenden, U.K.). Bean leaf roll and pea enation mosaic.
M. T. Cousin (Versailles, France). La "phyllodie du trèfle," maladie à virus transmise par cicadelles en France.

10. Production and maintenance of virus-free stocks.
Chairman: H. Ronde Kristensen (Lyngby, Denmark).
R. Antoine (Reduit, Mauritius). The role of thermotherapy in the production of virus-free planting material of sugar cane.
O. M. Stone (Littlehampton, U.K.). Meristem culture.
R. H. E. Bradley (Fredericton, Canada). Use of oil sprays to control viruses.
M. Hollings (Littlehampton, U.K.). Problems of indexing, propagation and distribution.
E. C. Calavan (Riverside, U.S.A.). Certification schemes for virus tested stocks.

BACTERIAL PLANT DISEASES

Organized by Dr. J. E. Crosse (East Malling Research Station, Nr. Maidstone, Kent U.K.) helped by Miss C. M. E. Garrett (East Malling, U.K.), Dr. D. C. Hildebrand (Berkeley, U.S.A.) and Mr. R. A. Lelliott (Harpenden, U.K.).

1. Survival of phytopathogenic bacteria.
Chairman: I. W. Buddenhagen (Honolulu, U.S.A.).
A. Coleno (Rennes, France). Essai sur le comportement en sol de bactéries phytopathogènes.
C. Logan (Belfast, U.K.). Survival of the potato black leg pathogen over winter.
Z. Volcani (Rehovot, Israel). Survival of *Pseudomonas lachrymans* in soil, plant debris and seed.
R. G. Grogan (Davis, U.S.A.). Survival of *Pseudomonas phaseolicola* in bean seed.
C. Leben (Wooster, U.S.A.). Growth of bacteria on plant surfaces.
C. M. Scarlett, E. Billing and B. J. Lloyd (Reading, U.K.). Epiphytic flora of the dwarf bean with special reference to *Pseudomonas viridiflava*.

2. Epidemiology and ecology of bacterial diseases.
Chairman: J. E. Crosse (East Malling, U.K.)
P. D. Dukes (Tifton, U.S.A.). The influence of soil temperature on pathogenesis of *Pseudomonas solanacearum* to four solanaceous hosts.
M. N. Schroth (Berkeley, U.S.A.). Ecology of *Agrobacterium tumefaciens*.
D. C. Hildebrand (Berkeley, U.S.A.). Bacterial blight of strawberry caused by *Xanthomonas fragariae*.
R. N. Goodman (Columbia, U.S.A.). Taxonomic features providing clues to virulence and epidemiology of the fireblight pathogen (*Erwinia amylovora*).
W. M. Dowler (Clemson, U.S.A.). Bacterial canker of stone fruits in the south-eastern United States.
J. E. Crosse and C. G. Panagopoulos (East Malling, U.K.). Factors predisposing infection of pear blossoms by *Pseudomonas syringae*.

3. Pathogenesis and pathogenic variability of bacterial pathogens
Chairman: D. De Lourdes d'Oliveira (Oeiras, Portugal).
M. Ridé, F. Eskandari and R. Mezily (Versailles, France). Pathogenèse des tumeurs du pin d'alep (*Pinus halepensis* Mil.).
G. L. Ercolani (Parma, Italy). Growth of bacteria in plant tissue.
J. E. Devay and S. L. Sinden (Davis, U.S.A.). Syringomycin: its production and role in bacterial canker of stone fruit trees.
F. N. Matthee (Stellenbosch, South Africa). The effects of host and environmental factors on the pathogenicity of *Xanthomonas pruni* and *X. vesicatoria*.
L. A. Brinkerhoff (Stillwater, U.S.A.). Variability of *Xanthomonas malvacearum* (E.F. Sm.) Dows. and the relation of host-reaction types to the build up of new pathotypes.
I. W. Buddenhagen (Honolulu, U.S.A.). On the origin and spread of a race of *Pseudomonas solanacearum*.

4. Host reactions and specificity in bacterial diseases.
Chairman: A. Kelman (Madison, U.S.A.).
C. G. Panagopoulos (Athens, Greece). Host specificity in *Pseudomonas syringae*.
B. W. Kennedy and M. Smith (St. Paul, U.S.A.). Nature and specificity of the bacterial blight reaction on soybean.
L. T. Lucas and R. G. Grogan (Davis, U.S.A.). Specific antigens of *Pseudomonas lachrymans* and other *Pseudomonas* pathotypes.
S. G. Desai, M. K. Patel, M. V. Desai and M. J. Thirumalachar (Anand and Poona, India). Host reactions and specificity in some *Xanthomonas* species.
A. A. Cook, R. E. Stall and J. M. Sasser (Gainesville, U.S.A.). Hypersensitivity in pepper to *Xanthomonas vesicatoria*.
Z. Klement and G. L. Farkas (Budapest, Hungary). Development of the hypersensitive reaction induced by plant pathogenic bacteria.

5. Taxonomy of phytopathogenic bacteria.
Chairman: R. A. Lelliott (Harpenden, U.K.).
J. De Ley (Ghent, Belgium). Molecular-biological approach to taxonomy of bacterial plant pathogens.
D. W. Dye (Auckland, New Zealand). A taxonomic study of the genus *Erwinia*.
I. Lazăr (Bucharest, Romania). Serological relationships of soft rot coliform bacteria.
G. C. Ainsworth (Kew, U.K.), J. C. L. Gilmour (Cambridge, U.K.)., P. H. A. Sneath (Leicester, U.K.), M. P. Starr (Davis, U.S.A.). Round Table Discussion: The subspecific classification of plant pathogenic bacteria.

ROOT DISEASES AND SOIL-BORNE PATHOGENS

Organized by Dr. S. D. Garrett (Botany School, Downing Street, Cambridge, U.K.), helped by Professor W. C. Snyder (Berkeley, U.S.A.), Dr. D. M. Griffin (Sydney, Australia), Professor R. Baker (Fort Collins, U.S.A.), Dr. J. Rishbeth (Cambridge, U.K.), Mr. R. A. Fox (Dundee, U.K.), Professor N. T. Flentje (Adelaide, Australia), and Professor S. Wilhelm (Berkeley, U.S.A.) who organized and introduced Symposia 1, 3, 5, 6, 8, 9 and 10.

1. Effect of root exudates on root infection (1).
Chairman: G. A. Zentmyer (Riverside, U.S.A.).
Introducer: W. C. Snyder (Berkeley, U.S.A.). Effect of host plant exudates on root infection by fungi—an introduction.
T. A. Toussoun (Berkeley, U.S.A.). Nutrition of spore germination and infection.
D. S. Hayman (Harpenden, U.K.). The influence of cotton seed exudate on seedling infection by fungi.
C. J. Hickman (London, Canada). Some factors involved in the accumulation of phycomycete zoospores on plant roots.
G. A. Zentmyer (Riverside, U.S.A.). Tactic responses of zoospores of *Phytophthora*.
S. M. Mircetich (Beltsville, U.S.A.). Germination of chlamydospores of *Phytophthora*.

2. Effect of root exudates on root infection (2).
Chairman: G. A. Zentmyer (Riverside, U.S.A.).
R. L. Dodman (Adelaide, Australia). *Rhizoctonia* infection structures (paper read in absence).
M. O. Garraway and A. R. Weinhold (Berkeley, U.S.A.). *Armillaria mellea* infection structures, rhizomorphs.
J. W. Gerdemann (Urbana, U.S.A.). Vesicular-arbuscular mycorrhiza and plant growth.
Audrey M. Shepherd (Harpenden, U.K.). Influence of root exudates on activity of some plant-parasitic nematodes.
J. A. Bourret (Tacoma, U.S.A.). Formation and germination of chlamydospores of *Fusarium*.
Discussion Leaders for (1) and (2) in order of speaking:
R. J. Cook, M. N. Schroth, H. H. Ho, N. T. Flentje, A. R. Weinhold, D. H. Marx, D. J. Royle, R. K. S. Wood.

3. Effect of soil moisture and aeration on fungal activity and root diseases.
Chairman: W. C. Snyder (Berkeley, U.S.A.).

Introducer: D. M. Griffin (Sydney, Australia). Effect of soil moisture and aeration on fungal activity—an introduction.

R. J. Cook (Pullman, U.S.A.). Effect of soil water on microbial antagonism and nutrient availability in relation to fungal diseases of plants.

D. J. Greenwood and D. Goodman (Wellesbourne, U.K.). Studies on the oxygen requirements of plant roots.

4. Miscellaneous papers: root diseases.

Chairman: S. D. Garrett (Cambridge, U.K.).

V. V. Kotova (Vizr, U.S.S.R.). New data on pea root-rot pathogens.

P. C. Cunningham (Carlow, Eire). Variability in pathogenicity and host specificity of *Ophiobolus graminis* and *Cercosporella herpotrichoides*.

Kisabu Iyatomi (Nagoya, Japan). Growth response of rice plants to soil fumigation.

Z. E. Bekker (Moscow, U.S.S.R.). Ecologico-physiological studies of *Fusarium* cotton wilt control.

J. R. Coley-Smith and J. E. King (Hull, U.K.). Germination in soil of sclerotia of *Sclerotium cepivorum*.

W. Krüger (Potchefstroom, S. Africa). Untersuchungen mit *Spacelotheca reiliana*: die Beeinflussung der Sporenkeimung im Boden.

5. Population level of pathogens in soil and its effect on diseases of field crops.

Chairman: J. Tammen (University Park, U.S.A.).

Introducer: R. Baker (Fort Collins, U.S.A.). Use of population studies in research on plant pathogens in soil.

J. D. Menzies (Beltsville, U.S.A.). Factors influencing pathogen populations in soil.

J. G. Bald (Riverside, U.S.A.). Host response and data interpretation.

Discussion Panel on significance of populations of major plant pathogens in soil.

Chairman: J. E. Mitchell (Madison, U.S.A.).

A. R. Weinhold (Berkeley, U.S.A.). Bacteria including *Streptomyces*.

A. F. Schmitthenner (Wooster, U.S.A.). *Phytophthora* and *Pythium*.

Shirley Nash Smith (Berkeley, U.S.A.). *Fusarium*.

R. L. Powelson (Corvallis, U.S.A.). *Verticillium*.

Y. Henis (Rehovot, Israel). *Rhizoctonia*.

6. Root diseases of forest crops (1).

Chairman: G. H. Hepting (Asheville, U.S.A.).

Introducer: J. Rishbeth (Cambridge, U.K.). The role of basidiospores in stump infection by *Armillaria mellea*.

M. J. Swift (London, U.K.). *Armillaria mellea* in Central Africa.

C. S. Hodges (Asheville, U.S.A.). *Fomes annosus* root rot in the Southern United States.

D. Punter (Maple, Canada). On *Fomes annosus* in Eastern Canada.

J. N. Gibbs (Cambridge, U.K.). Resin and the resistance of conifers to *Fomes annosus*.

7. Root diseases of forest crops (2).

Chairman: G. H. Hepting (Asheville, U.S.A.).

K. R. Shea (Corvallis, U.S.A.). *Poria* root rot: problems and progress in the Pacific Northwest.

R. F. Patton and D. T. Myren (Madison, U.S.A.). *Polyporus tomentosus* root rot in pine and spruce plantations in Wisconsin.

F. J. Newhook (Auckland, New Zealand). *Phytophthora cinnamomi* in New Zealand forests.

D. H. Marx and W. C. Bryan (Asheville, U.S.A.). The influence of soil bacteria on the mode of infection of pine roots by *Phytophthora cinnamomi*.

8. Root diseases of tropical plantation crops.

Chairman: J. L. Harley (Sheffield, U.K.).

Introducer: R. A. Fox (Dundee, U.K.). A comparison of methods of dispersal, survival and parasitism in some fungi causing root diseases of tropical plantation crops.

O. S. Peries (Nugegoda, Ceylon). The economics of the control of white root disease (*Fomes lignosus*) of *Hevea brasiliensis* in Ceylon.

P. D. Turner (Banting, Malaya). Some factors in the control of root diseases of oil palm.

R. H. Stover (La Lima, Honduras). The major banana diseases caused by *Fusarium*

oxysporum f. *cubense*, *Pseudomonas solanacearum*, and *Radopholus similis*. a study in comparative pathology.

9. Genetical aspects of pathogenic and saprophytic behaviour in root-infecting fungi.

Chairman: P. W. Brian (Glasgow, U.K.).

Introducer: N. T. Flentje (Adelaide, Australia). Genetical aspects of pathogenic and saprophytic behaviour in root-infecting fungi: Basidiomycetes with special reference to *Thanatephorus*.

M. E. Gallegly (Morgantown, U.S.A.). Genetical aspects of species of *Phytophthora*.

A. C. Hastie (Dundee, U.K.). The genetics of Imperfect phytopathogenic fungi.

J. R. Parmeter (Berkeley, U.S.A.). Variation and mechanisms of variation in root-infecting fungi.

P. R. Day (New Haven, U.S.A.). The significance of genetic mechanisms in soil fungi.

10. Crop growth responses to soil fumigation.

Chairman: K. F. Baker (Berkeley, U.S.A.).

Introducer: S. Wilhelm (Berkeley, U.S.A.).

Helga Tietz and S. Wilhelm (Berkeley, U.S.A.). One centennium of soil fumigation: its first years.

S. Wilhelm and P. E. Nelson (Berkeley, U.S.A.). A concept of rootlet health of strawberries in pathogen-free field soil achieved by fumigation.

J. Altman (Fort Collins, U.S.A.). Increased and decreased growth responses to soil fumigation.

Blanche Benzian (Harpenden, U.K.). Nutrition of young conifers and soil fumigation.

C. A. I. Goring (Walnut Creek, U.S.A.). Physical soil factors and soil fumigant action.

K. F. Baker (Berkeley, U.S.A.). Selective killing of soil micro-organisms by aerated steam.

MYCOTOXINS

Organized by Dr. P. H. Gregory (Rothamsted Experimental Station, Harpenden, Herts, U.K.) helped by Mr. P. K. C. Austwick (Weybridge, U.K.).

1. Mycotoxins.

Chairman: M. Crawford (Weybridge, U.K.).

P. K. C. Austwick (Weybridge, U.K.). Introductory survey.

Palle Krogh (Copenhagen, Denmark). The pathology of mycotoxins.

V. I. Bilai (Kiev, U.S.S.R.). Toxin producing fungi on cereal seeds and fodder, and some problems of health protection.

C. M. Christensen, G. H. Nelson and C. J. Mirocha (St. Paul, U.S.A.). Work on mycotoxins at the University of Minnesota.

2. Mycotoxins.

Chairman: J. P. van der Walt (Pretoria, South Africa).

P. G. Mantle (London, U.K.). The role of alkaloids in the poisoning of mammals by sclerotia of *Claviceps* spp.

P. J. Brook (Auckland, New Zealand). *Pithomyces chartarum* in pasture, and measures for prevention of facial eczema.

O. Uraguchi (Tokyo, Japan). Mycotic origin of cardiac beriberi.

E. B. Smalley (Madison, U.S.A). Mycotoxicosis associated with mouldy corn.

C. J. Rabie (Pretoria, South Africa). New toxic fungi and physiology of toxin production.

3. Mycotoxins.

Chairman: G. C. Ainsworth (Kew, U.K.).

J. P. van der Walt (Pretoria, South Africa). A review of progress in mycotoxin research by the South African C.S.I.R.

T. Asahi, Z. Mori, R. Majima and I. Uritani (Nagoya, Japan). Effects of aflatoxins on metabolic changes in plant tissue in response to injury.

D. McDonald (Zaria, Nigeria). *Aspergillus flavus* and its control in Nigeria.

J. L. Aucamp (Potchefstroom, South Africa). The role of mites in the development of aflatoxin in groundnuts.

K. H. Garren (Holland, U.S.A.). The mycotoxin potential—peanuts (ground-nuts); the U.S.A. viewpoint.

4. Mycotoxins.

Chairman: G. Lindberg (Vollebek, Norway).

U. L. Diener and N. D. Davis (Auburn, U.S.A.). Production of mycotoxins on peanuts under controlled environments.

H. W. Schroeder (College Station, U.S.A.). Factors influencing the development of aflatoxins in some field crops.

C. R. Jackson (Tifton. U.S.A.). Factors affecting aflatoxin development during growth and harvest of peanut by mechanized culture.

L. J. Ashworth (Shafter, U.S.A.). Epidemiological aspects of infection by *Aspergillus flavus* and occurrence of aflatoxins in cotton seeds.

A. Z. Joffe (Jerusalem, Israel). Toxic properties and effects of two Fusaria and *Aspergillus flavus*.

EPIDEMIOLOGY AND FUNGAL DISEASES

Organized by Dr. J. M. HIRST (Rothamsted Experimental Station, Harpenden, Herts., U.K.), PROFESSOR A. J. P. OORT (Agricultural University, Binnenhaven 9, Wageningen, Netherlands), and PROFESSOR R. D. SCHEIN (The Pennsylvania State University, 211 Whitmore Laboratory, University Park, Pennsylvania 16802, U.S.A.) helped by Dr. J. C. Zadoks (Wageningen, Netherlands), Dr. J. Rotem (Rehovot, Israel) for the programme generally, and Dr. J. Palti (Rehovot, Israel) for Symposium 5, and Mr. T. F. Preece (Leeds, U.K.) for Symposium 6.

1. Dissemination of pathogens.

Chairman: J. C. Zadoks (Wageningen, Netherlands).

D. S. Meredith (Honolulu, U.S.A.). Recent studies of spore liberation.

J. M. Hirst (Harpenden, U.K.). Water dispersal patterns.

F. E. Manzer (Orono, U.S.A.). Aerial photography of plant disease distribution.

P. H. Gregory (Harpenden, U.K.). Misinterpreting plant disease gradients.

J. E. Hermansen, H. Buus Johansen and H. Westenbaek Hansen (Copenhagen, Denmark). Distant spore dispersal.

2. Development of epidemics.

Chairman: R. D. Schein (University Park, U.S.A.).

A. J. P. Oort and L. C. A. Corsten (Wageningen, Netherlands). A model of the early stage of epidemics.

J. C. Zadoks (Wageningen, Netherlands). The epidemiology of yellow rust.

Ch. Populer (Gembloux, Belgium). *Peronospora tabacina* in Europe.

M. K. Khokhryakov (Leningrad, U.S.S.R.). The origin and establishment of new plant diseases in the U.S.S.R.

3. The effect of decreased inoculum.

Chairman: C. E. Yarwood, (Berkeley, U.S.A.).

J. R. Wallin (Ames, U.S.A.). Cercospora leaf spot of sugar beet.

E. F. Iton (Trinidad). A basis for the control of Ceratocystis wilt of cacao.

K. E. Hutton (Sydney, Australia). Control of apple scab (*Venturia inaequalis* (Cooke) Wint.) by decreasing overwintering inoculum.

R. T. Burchill (East Malling, U.K.). Decreasing overwintering inoculum of diseases of apple.

E. P. Van Arsdel (College Station, U.S.A.). Effectiveness of blister rust control through *Ribes* plant eradication.

4. Epidemic diseases of plants in the humid tropics.

Chairman: A. Johnston (Kew, U.K.).

E. Griffiths (Ruiru, Kenya) and F. J. Nutman (Nairobi, Kenya). Coffee berry diseases.

A. Kerr (Adelaide, Australia) and R. L. de Silva (Talawakele, Ceylon). Blister blight of tea (*Exobasidium vexans*).

S. H. Ou (Manila, Philippines). Rice diseases in the tropics.

R. H. Stover (La Lima, Honduras). The contrasting roles of conidia (*Cercospora*) and ascospores (*Mycosphaerella*) in the epidemiology of banana leaf spot.

P. Holliday (Trinidad). The spread of *Dothidella ulei* on *Hevea brasiliensis*.

5. Epidemic diseases of plants in dry climates.

Chairman: J. Rotem (Rehovot, Israel).

J. Rotem and J. Palti (Rehovot, Israel). Epidemiology of some field-crop diseases under semi-arid conditions, with special reference to irrigation effects.

A. Graniti and C. Laviola (Bari, Italy). Epidemiology of *Spilocaea oleagina* on olive in Italy.

H. C. Weltzien (Bonn, W. Germany). Erysiphaceae in der Republik Libanon.

C. M. Messiaen, P. Colbrant, P. Fourcade, P. Chrestian and J. P. Leroux (Montfavet, France). Epidemiology and forecasting of early and late blight of tomato in South Eastern France.

J. Palti and J. Rotem (Rehovot, Israel). Spray warnings for the control of seasonal disease outbreaks in field crops under semi-arid conditions.

6. Leaf surface phenomena and infection.

Chairman: L. C. P. Kerling (Baarn, Netherlands).

S. Sinha (Agra, India). Microbiology of the leaf surface and disease control.

J. S. Cole (Salisbury, Rhodesia). Behaviour of *Erysiphe cichoracearum* on tobacco leaves.

H. H. Sol (Baarn, Netherlands). Effect of leaf exudates on infection.

T. F. Preece and G. Barnes (Leeds, U.K.). The clover leaf surfaces as a spore trap.

Myra Chu Chou (Leeds, U.K.). Interaction between pollen grains and the early stages of *Botrytis* infection.

PLANT PATHOLOGY IN THE DEVELOPING COUNTRIES

Organized by Mr. A. Johnston (Commonwealth Mycological Institute, Kew, Surrey, U.K.).

Plant pathology problems in developing countries.

Chairman: S. P. Raychaudhuri (New Delhi, India).

Margaret A. Keay (Zaria, Nigeria). Organization and problems of research in plant pathology in developing countries.

M. A. Nour (Khartoum, Sudan). Problems in education on plant pathology in developing countries.

W. Carter (Hawaii, U.S.A.). Problems of extension work on plant protection in developing countries.

R. W. Rayner (Kew, U.K.). Plant quarantine problems in Africa.

L. Chiarappa (Rome, Italy). International assistance in plant pathology in developing countries.

NEMATODES

Organized by Mr. F. G. W. Jones (Rothamsted Experimental Station, Harpenden, Herts., U.K.) helped by Dr. D. C. M. Corbett (Harpenden, U.K.).

1. Nematode host-parasite relationships (1) Effect of parasite on host.

Chairman: W. F. Mai (Ithaca, U.S.A.).

Introducer: E. Cohn (Rehovot, Israel). Parasitic relationships of plant nematodes.

W. B. Mountain (Vineland, Canada). Effects of migratory root endo-parasites on the host.

B. Y. Endo (Beltsville, U.S.A.). Histology and histochemistry of giant cells.

E. L. Nigh (Tucson, U.S.A.). Effects of Meloidogyne on resistant lines of alfalfa.

C. C. Doncaster (Harpenden, U.K.). Penetration of plant tissues by some Tylenchida.

F. Sprau (München, W. Germany). Heavy damage to peppermint (*Mentha piperita* L.) and parsley (*Petroselinum sativum* Hoffm.) caused by some free living nematodes.

Discussion: R. A. Rohde (Amherst, U.S.A.).

2. Nematode host-parasite relationships (2) Effect of host on parasite.

Chairman: W. B. Mountain (Vineland, Canada).

Introducer: B. Weischer (Münster, W. Germany). Host influence on plant feeding nematodes.

J. Klinger (Waedensivil, Switzerland). Host attraction and repulsion.

J. D. Bijloo (s'Graveland, Netherlands). Substances in plants toxic to nematodes.

B. A. Oteifa (Giza, U.A.R.). Influence of plant nutrition.

J. M. Fisher (Adelaide, Australia). The role of the host in moulting.

G. P. Blair (Centeno, Trinidad). Influence of plant environment on the distribution and stages of *Rhadinaphelenchus cocophilus*.

Discussion: R. D. Winslow (Belfast, U.K.).

3. Breeding, properties and use of nematode resistant varieties.
Chairman: M. Oostenbrink (Wageningen, Netherlands).
Introducer: J. D. Hayes (Aberystwyth, U.K.). Breeding and selection of nematode resistant varieties.
R. A. Rohde (Amherst, U.S.A.). Mechanisms of resistance.
D. Sturhan (Münster, Germany). Variations in the pathogenicity of nematodes.
S. Bingefors (Uppsala, Sweden). Forage crops, the present position.
G. J. Curtis (Cambridge, U.K.). The contribution of plant breeding to nematode problems in sugar beet.
H. W. Howard (Cambridge, U.K.). Breeding potatoes resistant to *Heterodera rostochiensis*.
Discussion: J. Cotton (Aberystwyth, U.K.).

4. Population dynamics and population structure.
Chairman: N. G. M. Hague (London, U.K.).
Introducer: M. Oostenbrink (Wageningen, Netherlands). The use of models in population work.
J. J. Hesling (Littlehampton, U.K.). Population dynamics of *Ditylenchus dipsaci*.
R. S. Pitcher (East Malling, U.K.). The effect of nutrition and season of the year on the reproduction of *Trichodorus viruliferus* Hooper.
J. J. M. Flegg (Harpenden, U.K.). The population structure of *Xiphinema diversicaudatum*.
E. B. Brown (Wolverhampton, U.K.). Relationship between potato yields and number of *Heterodera rostochiensis*.
Discussion: F. G. W. Jones (Harpenden, U.K.).

5. Physiology and biochemistry of nematodes (1).
Chairman: C. Ellenby (Newcastle, U.K.).
Introducer: L. Krusberg (College Park, U.S.A.). Significance of enzyme systems in relation to pathogens and control.
G. Videgård (Åkarp, Sweden). Electrophoretic studies of pathotypes and local populations of potato-cyst nematode.
D. R. Viglierchio (Davis, U.S.A.). Nematodes and plant growth regulators.
R. F. Myers (New Brunswick, U.S.A.). Dietary and physical problems encountered during the cultivation of nematodes.
C. Ellenby (Newcastle, U.K.). Desiccation resistance in nematodes.
A. J. Clarke (Harpenden, U.K.). Natural and artificial hatching factors for *Heterodera* species.
Discussion: D. L. Lee (Huntingdon, U.K.).

6. Physiology and biochemistry of nematodes (2).
Chairman: B. Weischer (Münster, W. Germany).
Introducer: A. C. Triantaphyllou (Raleigh, U.S.A.). Cytogenetic aspects of evolution of plant nematodes.
D. L. Trudgill (Harpenden, U.K.). The effect of environment on sex determination in *Heterodera rostochiensis*.
C. D. Green (Harpenden, U.K.). Sexual stimulation between the sexes of nematodes.
C. T. Guile (Aberystwyth, U.K.). Cyst colour and pathotype in *H. rostochiensis*.
D. M. Parrott (Harpenden, U.K.). Results of single male-female matings in *H. rostochiensis*.
H. Hirumi, T. A. Chen and K. Maramorosch (Yonkers, U.S.A.). Embryonic development of *Meloidogyne incognita acrita* in excised gonads *in vitro*.
Discussion: B. Y. Endo (Beltsville, U.S.A.).

7. Structure and ultrastructure of nematodes.
Chairman: R. S. Pitcher (East Malling, U.K.).
Introducer: C. C. Doncaster (Harpenden, U.K.). Form and function in nematodes.
P. R. Thomas (Dundee, U.K.). The head region of *Longidorus*.
T. A. Chen, H. Hirumi, K. Jin Lee and K. Maramorosch (Yonkers, U.S.A.). Ultrastructure of the feeding apparatus and nervous system of the cephalic region of *Trichodorus christiei*.
D. L. Lee (Huntingdon, U.K.). The structure of the alimentary tract of some nematodes.
H. H. Triantaphyllou (Raleigh, U.S.A.). Structure and development on a cellular level of the reproductive system of certain nematodes.

B. Günther and L. Kämpfe (Griefswald, German Democratic Republic). Evidence for the production of lysozymes by nematodes.
Discussion: C. E. Taylor (Dundee, U.K.).

8. The soil as an environment for nematodes.
Chairman: W. R. Jenkins (New Brunswick, U.S.A.).
Introducer: L. H. Stolzy and S. D. van Gundy (Riverside, U.S.A.). The properties of the soil as an environment.
R. J. B. Williams (Harpenden, U.K.). Soil aggregate stability and its influence on porosity.
S. D. van Gundy and L. H. Stolzy (Riverside, U.S.A.). Soil aeration and nematode ecology.
Abrar Mustafa Khan and S. K. Saksena (Aligarh, India). The influence of some plant residues on plant parasitic nematodes.
D. W. Larbey (Sharnbrook, U.K.). Space available for *Xiphinema diversicaudatum* in an untilled clay soil.
R. C. Cooke (Sheffield, U.K.). Requirements of nematode trapping fungi in soils.
Discussion: W. F. Mai (Ithaca, U.S.A.).

9. Control, new methods and future prospects (nematodes).
Chairman: J. Grainger (Auchincruive, U.K.).
F. C. Peacock (Bracknell, U.K.). The outlook for plant chemotherapy.
J. Montagne (Sittingbourne, U.K.). New and emerging nematicides of promise.
C. I. Hannon (Lake Alfred, U.S.A.). Making the most of soil sterilants.
I. J. Thomason, C. E. Castro and C. F. Marks (Riverside, U.S.A., and Vineland, Canada). Penetration and selectivity of nematicides.
K. Evans (Harpenden, U.K.). Male sterility and other methods.
F. G. W. Jones (Harpenden, U.K.). Some theoretical reflections on control measures.
Discussion: A. G. Whitehead (Harpenden, U.K.).

DISEASE COMPLEXES

Organized by Dr. F. T. Last (Glasshouse Crops Research Institute, Rustington, Littlehampton, U.K.).

1. Host responses to simultaneous attack by two or more different pathogens.
Chairman/Introducer: S. P. Raychaudhuri (New Delhi, India).
G. E. Russell (Cambridge, U.K.). Specific interactions between virus and fungus diseases in sugar beet.
J. P. Ross (Raleigh, U.S.A.). Interrelationships of soybean mosaic and bean pod mottle viruses in soybean.
J. M. Thresh (East Malling, U.K.). Interrelationships between reversion virus and its gall mite vector (*Phytopus ribis* Nal.) on blackcurrant.
W. R. Jenkins (New Brunswick, U.S.A.). Plant growth as affected by uni- and multi-specific nematode inocula.
C. D. McKeen (Harrow, Canada). Response of muskmelon to soil inoculation with *Pythium ultimum*, *Verticillium dahliae* and *Thielaviopsis basicola*.
D. R. Houston (Connecticut, U.S.A.). Basal canker of white pine—a complex involving the interaction of fungi, ants and adverse environment.

2. The approach to root diseases of uncertain cause.
Chairman/Introducer: Z. A. Patrick (Toronto, Canada).
W. B. Mountain (Vineland, Canada). Peach replant failure.
H. Hoestra (Wageningen, Netherlands). Apple and cherry replant diseases.
G. A. Salt (Harpenden, U.K.). Germination and growth failure of spruce in nursery seedbeds.
A. G. Whitehead (Harpenden, U.K.). Docking disorder of sugar beet.
Contributors to Discussion: B. M. Savory (Ongar, U.K.), D. Mulder (Wageningen, Netherlands).

3. Interactions between plant pathogenic nematodes and fungi.
Chairman/Introducer: N. G. M. Hague (London, U.K.).
J. R. Bloom and Pamela Bowman (University Park, Penn., U.S.A.). Role of root knot nematodes in breaking resistance to *Fusarium* wilt in tomato.
L. R. Faulkner and C. B. Skotland (Prosser, U.S.A.). Factors influencing the interaction of *Pratylenchus minyus* and *Verticillium dahliae* in Verticillium wilt of mint.

J. E. Edmunds (St. Lucia, W.I.). Mechanisms of interaction between *Fusarium oxysporum, Trichoderma viride* and *Pratylenchus penetrans* on alfalfa roots.

N. T. Powell (Raleigh, U.S.A.). Disease complexes in tobacco involving interactions between *Meloidogyne incognita* and soil-borne fungal pathogens.

E. Dunn (Edinburgh, U.K.). Interrelationship of the potato-cyst eelworm and certain fungi on the growth of tomatoes.

Contributor to Discussion: R. S. Pitcher (East Malling, U.K.).

GENETICS OF PATHOGENICITY AND RESISTANCE

Organized by DR. R. C. F. MACER (Rothwell Plant Breeders, Rothwell, Lincs, U.K.).

1. Genetics of resistance to rust diseases.

Chairman: H. H. Flor (Fargo, U.S.A.).

Introducer: C. O. Person (Vancouver, Canada).

R. Johnson (Cambridge, U.K.). Genetics of resistance of barley to yellow rust.

L. J. Littlefield (Fargo, U.S.A.). Biologically induced resistance to flax rust.

A. L. Hooker (Urbana, U.S.A.). Inheritance of resistance in maize to rust caused by *Puccinia sorghi.*

Discussion.

R. W. Stubbs (Wageningen, Netherlands). *Puccinia striiformis* Westend f.sp. *tritici*. The evolution of the genetic relationship of host and parasite.

E. J. Guthrie (Njoro, Kenya). Wheat stem rust in Kenya.

G. Zitelli (Bari, Italy). Genetic factors of resistance to Italian races of *Puccinia recondita* and *P. graminis tritici* present in Baladi 116 (*T. durum*).

Discussion.

2. Genetics of resistance to rust diseases.

Chairman: A. L. Hooker (Urbana, U.S.A.).

Introducer: J. C. Zadoks (Wageningen, Netherlands).

D. R. Knott and K. N. Kao (Saskatoon, Canada). Genes for stem rust resistance in wheat and their interaction with genes for pathogenicity in the rust.

D. M. Stewart and B. J. Roberts (St. Paul, U.S.A.). A modified international system for identification of oat stem rust races.

C. E. Ahlgren (Ely, U.S.A.). Breeding for resistance to white pine blister rust.

Discussion.

A. J. Bettencourt and M. Noronha-Wagner (Oeiras, Portugal). Genetic factors conditioning the resistance of *Coffea arabica* to *Hemileia vastatrix*.

B. C. Clifford and J. F. Schafer (Lafayette, U.S.A.). Non race-specific resistance of *Avena sativa* L. to *Puccinia coronata* Cda var. *avenae* F. & L.

Discussion.

3. Genetics of resistance to potato pathogens.

Chairman: N. F. Robertson, (Hull. U.K.).

W. Black (Roslin, U.K.). Major and minor gene resistance to *Phytophthora infestans* in potatoes.

J. S. Niederhauser (Londres, Mexico). Resistance to *Phytophthora infestans* in Mexico.

Discussion.

J. Galindo-Alonso (Chapingo, Mexico). Cytology and genetics of the genus *Phytophthora.*

C. E. Caten (London, Canada). Pathogenic and cultural variation among single zoospore isolates of *Phytophthora infestans.*

H. W. Howard (Cambridge, U.K.). The relation between resistance genes in potatoes and pathotypes of potato-root eelworm (*Heterodera rostochiensis*), wart disease (*Synchytrium endobioticum*) and potato virus.

V. Umaerus (Svalöv, Sweden). Screening of *Solanum* species for field resistance to *Phytophthora infestans.*

4. Genetics of resistance to powdery mildew diseases, and rice blast disease.

Chairman: B. Leijerstam (Svalöv, Sweden).

Introducer: M. S. Wolfe (Cambridge, U.K.).

S. H. Ou (Los Banos, Philippines). Breeding for resistance to rice blast disease.

A. Wiberg (Svalöv, Sweden). Resistance of barley to powdery mildew.

J. G. Moseman (Beltsville, U.S.A.). Development and application of near-isogenic lines for studying barley powdery mildew.

Discussion.

A. H. Ellingboe (East Lansing, U.S.A.). Genetic control of mildew development.
J. R. Stavely (Beltsville, U.S.A.). Resistance to *Erysiphe polygoni* in *Trifolium pratense* and to *Alternaria tenuis* and *Cercospora nicotianae* in *Nicotiana*.
J. D. Hayes and I. T. Jones (Aberystwyth, U.K.). Race specific and non-race specific host resistance to *Erysiphe graminis* f.sp. *avenae*.
Discussion.

5. Genetics of virulence in forms of Erysiphe.
Chairman: J. G. Moseman (Beltsville, U.S.A.).
Introducer: R. C. F. Macer (Rothwell, U.K.).
B. Leijerstam (Svalöv, Sweden). Inheritance of virulence in *Erysiphe graminis* f.sp. *tritici*.
M. S. Wolfe (Cambridge, U.K.). Application of the gene-for-gene hypothesis in cereal powdery mildew.
J. Benada (Kroměříž, Czechoslovakia). Redox potential and the change of resistance of varieties in relation to the changes in environment.
Discussion.
E. Ralski (Krakow, Poland). Studies in susceptibility of barley varieties to powdery mildew (*Erysiphe graminis* f. *hordei*) and its biological differentiation in Poland.
W. R. Jarvis (Dundee, U.K.). Induction of endophytism and changes in virulence in some powdery mildews.
V. Grasso, O. Padalino, and D. Sisto (Bari, Italy). Physiologic races of mildew in 1967 in Italy.
Discussion.

6. Genetics of resistance and virulence in miscellaneous diseases.
Chairman: E. C. Stakman (New York, U.S.A.).
Introducer: W. G. Keyworth (Wellesbourne, U.K.).
P. R. Day and J. E. Puhalla (New Haven, U.S.A.). The genetic control of virulence and pathogenicity.
C. O. Person (Vancouver, Canada). The use of induced mutations of *Ustilago hordei* in a study of host-parasite interactions.
Discussion.
K. Shepherd and D. S. Lacy (Kingston, Jamaica). Resistance of mature banana plants and seedlings to fusarial wilt in Jamaica.
E. A. Jamalainen (Tikkurila, Finland). Resistance of Scandinavian gramineous plant breeding material to low temperature parasitic fungi.
Discussion.

7. Genetics of resistance to diseases caused by bacteria and viruses.
Chairman: P. H. A. Sneath (Leicester, U.K.).
Introducer: R. L. Knight (East Malling, U.K.).
P. Matthews (Norwich, U.K.). Genetics of breeding sweet cherries resistant to bacterial canker.
S. M. Mircetich (Beltsville, U.S.A.). Stem pitting of peach, a new disorder in Eastern United States.
Discussion.
L. J. Alexander (Wooster, U.S.A.). Breeding for resistance to virus diseases of tomato.
J. R. O. Dawson (Norwich, U.K.). The nature and inheritance of resistance in tomato to tomato mosaic virus.
J. Pelham (Littlehampton, U.K.). Tomato and tomato mosaic virus—a dynamic relationship.
Discussion.

8. General principles in breeding for disease resistance and international co-operation.
Chairman: J. C. Walker (Madison, U.S.A.).
Introducer: D. R. Knott (Saskatoon, Canada).
G. D. H. Bell (Cambridge, U.K.). Breeding for disease resistance in agricultural crops.
A. Hafiz (Cairo, U.A.R.). International co-operation in breeding for disease resistance.
J. C. Zadoks (Wageningen, Netherlands). Reflections on resistance.
Discussion of resolutions on centres of origin.
R. Manner (Jokioinen, Finland). Study of resistance to *Rhynchosporium secalis* in barley. Aspects of the possibility of international co-operation.

Discussion on International Nurseries.

B. von Schmeling (Bethany, U.S.A.). Vitavax. A new chemical aid in breeding for disease resistance.

Discussion.

DISEASE ASSESSMENT

Organized by Dr. F. Joan Moore (Plant Pathology Laboratory, M.A.A.F., Hatching Green, Harpenden, Herts., U.K.).

1. Cereal leaf disease assessment.

Chairman: Miss F. J. Moore (Harpenden, U.K.).

D. A. Doling (High Wycombe, U.K.). Cereal mildew.

G. J. Green (Winnipeg, Canada). Cereal rusts in Canada.

2. Economic losses caused by plant diseases.

Chairman: A. J. Skolko (Ottawa, Canada).

C. W. Nichols (Sacramento, U.S.A.). The University of California's project.

W. D. McClellan (Beltsville, U.S.A.). The International Biological Programme's plans.

L. Chiarappa (Rome, Italy). F.A.O.'s Manual on Crop Losses (read by E. LeClerg).

SEED PATHOLOGY

Organized by Dr. Mary Noble (Agricultural Scientific Services, East Craigs, Edinburgh 12, U.K.).

1. (Part 1) Seed Pathology.

Chairman: J. R. Thomson (Edinburgh, U.K.).

C. Leach (Corvallis, U.S.A.). Light induced sporulation in seed-borne fungi.

H. Kolk (Solna, Sweden). Seedling diseases of cereals in Sweden.

J. Colhoun and R. A. P. Malalasekera (Manchester, U.K.). A technique for determining the intensity of infection of wheat seeds with *Fusarium culmorum*.

J. de Tempe and T. Limonard (Wageningen, Netherlands). Some remarks on methods of seed health testing.

1. (Part 2). Seed Pathology.

Chairman: P. Neergaard (Copenhagen, Denmark).

C. Anselme and R. Champion (Paris, France). Origin and importance of plant pathogenic fungi on seeds according to areas of production in France.

E. E. Leppik (Beltsville, U.S.A.). Quarantine and seed pathology.

J. Marrou (Montfavet, France) and I. Rohloff (Münster, Germany). Seed-borne virus diseases, with special reference to lettuce mosaic.

2. Seed Pathology.

Chairman: K. F. Baker (Berkeley, U.S.A.).

S. P. Raychaudhuri (New Delhi, India). Intensification of seed pathology work in India and need for proper quarantine measures.

R. D. Maude (Wellesbourne, U.K.). Seed treatment by the Thiram soak method.

J. W. Guthrie (Moscow, U.S.A.). Detection and eradication of *Pseudomonas phaseolicola* in *Phaseolus vulgaris*.

K. F. Baker (Berkeley, U.S.A.). Aerated-steam treatment of seed for disease control.

P. Neergaard (Copenhagen, Denmark). Seed pathology, international co-operation and organization.

J. R. Thomson (Edinburgh, U.K.). Health as a factor in seed quality.

POLLUTION DAMAGE TO PLANTS

Organized by Dr. P. J. W. Saunders (National Institute of Agricultural Botany, Cambridge, U.K.) who wishes to thank Dr. S. D. Garrett (Cambridge, U.K.) for help and guidance in the early planning of the Symposia and Dr. J. T. Middleton (Washington, D.C., U.S.A.) and Professor O. C. Taylor (Riverside, U.S.A.) who suggested many of the topics and contributors.

1. Photochemical oxidants.

Chairman: O. C. Taylor (Washington, U.S.A.).

P. J. W. Saunders (Cambridge, U.K.). Introductory review of pollution damage to plants.

O. L. Gilbert (Newcastle, U.K.). Pollution damage to lower plant life with special reference to lichens and bryophytes.
E. F. Darley (Riverside, U.S.A.), J. T. Middleton (Washington, U.S.A.) and O. C. Taylor (Riverside, U.S.A.). Phytochemical and exhaust fume damage to plants.
O. C. Taylor (Riverside, U.S.A.). Phytotoxicity of nitrogen oxides.
J. B. Mudd (Riverside, U.SA.). Biochemical effects of peroxyacetyl nitrate and ozone.
M. Treshow (Utah, U.S.A.). Ozone damage to plants.

2. Damage by other specific pollutants (1).
Chairman: R. H. Daines (New Brunswick, U.S.A.).
Prefacing remarks by Chairman: Investigations at Rutgers University.
A. Th. Czaja (Aachen, W. Germany). The effects of dust with alkaline surface reaction of the particle, especially of lime-kiln and cement-kiln dusts on plants.
F. A. Wood (University Park, U.S.A.). Effects of air pollution on forests.
T. A. Mansfield (Lancaster, U.K.). Effects of pollutants on the behaviour of stomata.
F. H. Spierings (Wageningen, Netherlands). Effect of pollution on crop yield.

3. Damage by other specific pollutants (2).
Chairman: J. G. ten Houten (Wageningen, Netherlands).
Prefacing remarks by Chairman: European problems and world co-operation.
R. Guderian and H. van Haut (Essen, W. Germany). Recognition and evaluation of the effects of sulphur dioxide on plants.
H. Zahn (Frankfurt, W. Germany). Fumigation experiments with sulphur dioxide.
L. Weinstein and D. C. McCune (Yonkers, U.S.A.). Metabolic effects of atmospheric fluorides upon plants.
A. Rich (Durham, U.S.A.). Highway de-icing compounds and their effects on plants.
C. G. Dobbs (Bangor, U.K.). A general discussion of the points arising from the previous papers and their implications in conservation and agriculture.

OFFERED PAPERS ON MISCELLANEOUS SUBJECTS

A considerable number of papers were submitted for inclusion in the Congress. Almost all were accepted; a few were placed in Symposia, the rest were given in the meetings listed below.

1. Miscellaneous papers (physiology, electron microscopy).
Chairman: R. J. W. Byrde (Long Ashton, U.K.).
*S. Akai, *M. Fukutomi, **Y. Inatsuga and *M. Shiraishi (*Kyoto and **Tokyo, Japan). Application of a scanning electron microscope to studies in phytopathology.
A. A. Bitancourt (Sao Paulo, Brazil). The effect of exogenous auxin on the physiology of crown-gall tissue cultures.
Yu-Ho Chan and W. E. Sackston (Ste. Anne de Bellevue, Canada). Mechanisms of pathogenesis in *Sclerotium bataticola* Taub.
T. I. Fedotova (Leningrad, U.S.S.R.). Immunologic aspects of parasitism revealed by plant disease causal agents.
N. N. Guseva (Leningrad, U.S.S.R.). Mechanisms of plant protective reactions to Verticillium wilt infection.

2. Miscellaneous papers (viruses).
Chairman: A. F. Posnette (East Malling, U.K.).
A. J. H. Carr and P. L. Catherall (Aberystwyth, U.K.). Virus diseases of herbage crops in relation to amelioration through plant breeding.
H. Gaona-Rodriguez and R. S. Halliwell (College Station, U.S.A. and Monterrey, Mexico). Investigations of the mechanism of the necrotic response of *Nicotiana tabacum* L. var. *samsun* to infection with tobacco mosaic virus.

3. Miscellaneous papers (bacteria, fungi).
Chairman: J. E. Crosse (East Malling, U.K.).
R. F. Numić (Sarajevo, Yugoslavia). Lysogeny in *Xanthomonas phaseoli* var. *sojensis*.
D. Weber (Houston, U.S.A.). Wax components in fungus spores.

4. Miscellaneous papers (root parasites).
Chairman: J. L. Harley (Sheffield, U.K.).
H. Bochow and H. H. Schmidt (Berlin, D.D.R.). Beobachtungen über das Aufreten von Fusskrankheiten bei Lupinen in Verschiedenen Fruchtfolgen (Observations on the occurrence of root diseases of lupins in different crop rotations).
H. Schuepp (Wädenswil, Switzerland). Significance of pH and temperature in relation to the soil fungistatic principle.
K. Singh (Lucknow, India). Spatial distribution of plant parasitic nematodes in the root zone of sugar cane.

5. Miscellaneous papers (vascular wilts, pollution damage).
Chairman: I. Isaac (Swansea, U.K.).
G. F. Pegg (Wye, U.K.). The reactions of susceptible and resistant tomato varieties to strains of *Verticillium alboatrum*.
D. Davis (New York, U.S.A.). The role of fusaric acid in selective pathogenicity of *Fusarium oxysporum*.
C. Jauch (Buenos Aires, Argentina). Physiological and histochemical changes in peas wilted by *Fusarium oxysporum* f. *pisi* (Linford) Snyder and Hansen.
N. S. Subba Rao, C. L. Chopra and R. P. Sethi (New Delhi, India). Sensitivity of Rhizobium to fusaric acid.
I. Pelikanova (Bratislava, Czechoslovakia). The effect of sodium fluoride on apple trees in pots.

6. Miscellaneous papers (genetics, disease resistance).
Chairman: F. G. H. Lupton (Cambridge, U.K.).
E. W. Ryan (Kinsealy, Ireland). Rapid methods of assessing pea varieties for resistance to *Peronospora pisi*.
N. A. Dorozhkin and Z. I. Remnyeva (U.S.S.R.). Specialization of *Phytophthora infestans*—pathogen of late blight in Byelorussia.
K. V. Popkova (A. B. Borisenok, U.S.S.R.). Variability of virulence characters of *Phytophthora infestans* races.
V. F. Peresypkin, N. I. Salunskaya, V. I. Shkodenko, L. N. Shelekhova and L. F. Rudenko (Kiev, U.S.S.R.). Resistance to corn smut (*Ustilago zeae* Corda).
V. N. Shevchenko (U.S.S.R.). Sugar beet breeding for resistance to storage rot and other diseases in the U.S.S.R.
Eliza H. de Mazoti (Llavallol, F.N.G.R., Argentina). Behaviour of *Tilletia intermedia* from Argentina.

7. Miscellaneous papers.
Chairman: Miss F. Joan Moore (Harpenden, U.K.).
N. Prasad and P. D. Gemawat (Udaipur, India). Epidemiological studies of Alternaria blight of *Cuminum cyminum* L.
K. H. Chee (Kuala Lumpur, Malaysia). Variability in *Phytophthora* isolates from *Hevea brasiliensis*.
A. A. Sarasola and Maria A. R. de Sarasola (Castelar FNDFS, Argentina). Corn lodging: relations between soluble solids, inorganic phosphates and basal stalk and root rots in mature plants.

8. Miscellaneous papers.
Chairman: G. C. Ainsworth (Kew, U.K.).
L. N. Andreev (Moscow, U.S.S.R.). Effect of rust on uncoupling of respiration and phosphorylation of wheat.
M. N. Talieva (Moscow, U.S.S.R.). Physiological peculiarities of germination of conidia of *Peronospora destructor* (Berk.) Casp.
J. M. Plotnikova (Moscow, U.S.S.R.). Ectodesmata of diseased plants.
A. E. Protsenko (U.S.S.R.). The evolution of parasitism of phytopathogenic viruses.
C. Sandu-Ville (Rumania). On some new species of micromycetes for the mycological flora of Rumania.