deposits in agriculture. A visit to Prigorodni State Farm (of 2,700 hectares), near Leningrad, revealed that experiments in the application of peat in agriculture were at an early stage. Even allowing for the latitude and relatively poor sandy podzolized soils of the region, production figures quoted were relatively low both per hectare and per man. Selected topics discussed at the Congress itself were humic fertilizers and their effect on plant metabolism, the making of composts from peat and pig excrements, trace element deficiencies so characteristic of bog soils, long-term effects of peat fertilizers on yield and quality of plant, use of peat fertilizers in afforestation, and the effects of the penetration of plant cells by humic substances.

In Section 4 on peat physics and chemistry and peat balneology, that is, its use in medicine, there were four chairmen, M. Volorovich (U.S.S.R.), R. Kadner (East Germany), A. Sundgren (Finland) and I. F. Prado (Cuba). Themes examined included types of peat fuel, the coking of various compressed peat products, the constitution of peat wax as separated by column chromatography, cation exchange capacities of peat, the manufacture of water-gas from milled and powdered peat, the extraction and composition of peat-bitumens, the problem of humic substances bound differentially in a colloidal complex, and observations on autothermal peat dust gasification experiments on an industrial scale. The application of peat and associated muds in balneology were demonstrated by data from Munich, Neydharting (Austria), and various parts of the U.S.S.R. including Sochi on the Black Sea coast. This was substantial evidence of partial success

in demonstrating the curative effects of peat and bog-muds for certain types of disability or disease in human beings.

The Soviet authorities are to be congratulated on their hospitality and energy in organizing this second Congress which enabled valuable interchange of ideas and methods. It is to be hoped that the time-interval between the second and the third Congress will be less than that between the first and the second.

J. A. TAYLOR

- ¹ Pessi, B. Y., "On the Effect of Addition of Mineral Soils on Temperature Conditions of Cultivated Peatland". Second Intern. Peat Congress, Leningrad, U.S.S.R., August 1963.
- ² Taylor, J. A., "Marling Experiments to Measure the Modification of Soil Temperature Regimes and Relative Productivity of Lancashire Mosslands". Welsh Soils Discussion Group, Report No. 4 (in the press).
- ³ Radforth, N. B., "The Principles of Airphoto Interpretation as Related to Organic Terrain". Second Intern. Peat Congress, Leningrad, U.S.S.R., August 1963.
- ⁴ Gore, A. J. P., "Comparative Ecological Studies on Peats at Two Different Altitudes in Northern England". Second Intern. Peat Congress, Leningrad, U.S.S.R., August 1963.
- ⁵ Scottish Peat Committee, Report No. 1, Scottish Home Dept. (H.M.S.O., Edinburgh, 1954). Report No. 2, Dept. of Agriculture and Fisheries for Scotland (H.M.S.O., Edinburgh, 1962).
- ⁶ Forestry Commission, *Experiments in Tree Planting on Peat*. Bulletin No. 22 (H.M.S.O., 1954).
- ⁷ Taylor, J. A., "The Peat Deposits of Wales". Second Intern. Peat Congress, Leningrad, U.S.S.R., August 1963.
- ⁸ Mitchell, G. F., *Adv. Sci.*, **17**, 313 (1960).
- ⁹ Bartley, D. D., *J. Ecol.*, **48**, 205 (1960).
- ¹⁰ Bartley, D. D., *New Phytol.*, **59**, 238 (1960).
- ¹¹ Watson, E., *Periglacial Action in the Uplands of Mid-Wales*. Report No. 2 of the Welsh Soils Discussion Group, 11 (1962).
- ¹² Seddon, J., *Phil. Trans. Roy. Soc. London*, Series B, No. 716, **244**, 459 (1962).
- ¹³ Wood, A., *Geog. J.*, **128**, Pt. 1, 301 (1962).
- ¹⁴ Taylor, J. A., Report No. 2 of the Welsh Soils Discussion Group, 29 (1962).
- ¹⁵ Stewart, V. I., Report No. 2 of the Welsh Soils Discussion Group, 19 (1962).
- ¹⁶ Dwyer, D. J., *Geog. J.*, **128**, Pt. 2, 184 (1962).
- ¹⁷ Walsh, T., O'Hare, P. J., and Quinn, E., *Adv. Sci.*, **14**, 405 (1958).

ANTIMICROBIAL AGENTS AND CHEMOTHERAPY

THE third Interscience Conference on Antimicrobial Agents and Chemotherapy was held in the Mayflower Hotel, Washington, D.C., under the sponsorship of the American Society for Microbiology during October 28-30, 1963. Registered attendance at this meeting reached 825, a much larger number than that attending the second Conference in Chicago in November 1962. Foreign participants included a group of 12 from Japan, 16 from Canada, 6 from England, as well as scientists from 17 other countries.

The three-day Conference was opened with a greeting from J. R. Porter, president of the American Society for Microbiology, and an address on "Recent Legislation and the Development of New Drugs", by W. B. Rankin, assistant commissioner of food and drugs, Food and Drug Administration, Department of Health, Education and Welfare. Among the features of the Conference were five symposia including: (1) "Chemistry of Antibiotics" (convened by C. P. Schaffner), with discussions of chemical aspects of the synthesis of tetracycline by H. Muxfeldt, the structure of viomycin by J. R. Dyer, the structure of streptolydigin by K. L. Rinehart, fatty acids from asparticin by W. K. Hausmann, and the structure of vernamycin B-type antibiotics by M. Ondetti; (2) "Infections Presenting Special Problems in Chemotherapy" (convened by W. L. Hewitt), with discussions of chemotherapy of staphylococcal infections by M. Hamburger, management of Gram-negative bacillary infections of the gastrointestinal and central nervous systems by P. F. Wehrle and infections in association with malignancy by J. P. Sanford; (3) "Side Reactions Attributed to Antimicrobial Agents" (convened by H. F. Dowling), with discussions of immunochemical basis for penicillin allergy by C. W. Parker, damage to the eighth nerve associated with antibiotic therapy by Martha D. Yow, reactions to antibiotics—blood dyscrasias by C. M. Huguley, and clinical experi-

ence with the use of potentially nephrotoxic antibiotics in the treatment of infections in uraemic patients by C. M. Kunin; (4) "Mode of Action of Antibiotics" (convened by D. Perlman), with summaries on penicillin by J. T. Park, streptomycin by C. Hurwitz, polyene antifungal agents by S. C. Kinsky, and erythromycin by S. B. Taubman; (5) "Antimicrobials in Veterinary Medicine" (convened by C. G. Durbin), with papers on antibiotics as anthelmintics by R. F. Shumard, antibiotics and antimicrobials in therapy of fish diseases by K. Wolf, and special antibiotic preparations for veterinary use by I. S. Rossof.

Among the new antibiotics announced at the meeting were: gentamicin, antibiotic MSD-235, doricin, LL-AE705W, LL-AM684B, MSD-92, and anthricidins A and B. The cytotoxic and anti-tumour substances described included: BA-17039-A and B, BA-90912, BA-181314, septacidin and peliomycin. An informal session heard S. A. Waksman discuss problems of nomenclature of antibiotics, and the chairman was instructed to request that the American Society for Microbiology form a group to consider this problem.

Clinical reports were presented on the effectiveness of the following antibiotics: gentamicin; lincomycin; ampicillin, cephalothin, naphthacillin, methicillin, cloxacillin, ampicillin and oxacillin. Papers on the following antimicrobial agents were also on the programme: sulphamethoxazole, 2-methoxy-4-sulphanilamidoquinazoline, 1-(5-nitro-2-furyl)-2-[5-amino-2-(1,3,4-thiadiazolyl)]ethylene-1-(5-nitro-2-furyl)-2-(6-amino-3-pyridazyl)-ethylene, N-(5-nitrofurfurylidone)-1-amino-2-imidazolidinone, 2,4,5-trichlorophenyl-γ-iodopropargyl ether, 'Salvizol', and 2'-deoxy-5-iodouridine.

One day of the conference was devoted to discussions of topics in infectious diseases. Among these were: bacterial endotoxins; anti-*Pasteurella pestis* factor, anti-

biotic therapy in *Proteus mirabilis* pyelonephritis, *Streptococcus agalactiae* infections, and chemoprophylaxis of induced typhoid fever and tularaemia.

Papers summarizing and discussing problems in methodology included: preparation and performance of antibiotic disks as aids in determining antibiotic sensitivity of bacteria; the occurrence of antibiotic-producing actinomycetes in soils, X-ray powder diffraction in identification of antibiotics, and preparative thin-layer chromatographic methods as used in investigations of antibiotics. The anticoagulant properties of tetracyclines and complexes formed between tetracyclines and penicillins with blood serum proteins were also discussed.

The programme included 174 presented papers, 17 papers as "read by title", and 2 papers listed but not presented. Most of these 193 papers will appear in *Antimicrobial Agents and Chemotherapy-1963*, which will be published by the American Society for Microbiology later in 1964. This will be distributed to all registrants at the meeting (as a result of a combined fee for registration and the book) and will be available for 12 dollars from the American Society for Microbiology. The papers were contributed by laboratories in Canada, Chile, Czechoslovakia, Greece, Japan, Puerto Rico, West Germany, as well as the United States.

Exhibits were included as part of the meeting for the first time with 18 firms represented. These stressed equipment used in growing antibiotic-producing microorganisms, methods of assaying antibiotics, various types of laboratory glassware, tissue culture media ingredients, equipment used in chemical laboratories including tracer techniques, bacteriological equipment, etc.

Plans for the fourth Interscience Conference on Antimicrobial Agents and Chemotherapy are already under way. This meeting will be held during October 26-28, 1964, in the Commodore Hotel, New York City. The programme committee under the chairmanship of Nestor Bohonos has already begun organizing this meeting. Their plans will take into account the results of a public opinion poll held at the third Conference. The majority of the 197 registrants responding favoured a three-day meeting with as many as three simultaneous sessions instead of a four-day meeting (with double sessions), symposia but not contributed papers in the evening (if evening sessions are necessary), and having exhibits. The deadline for abstracts of contributed papers is July 24, 1964. Further information can be obtained from the office of the executive secretary of the American Society for Microbiology, R. W. Sarber, 115 Huron View Boulevard, Ann Arbor, Michigan. DAVID PERLMAN

ITERATIVE SOLUTION OF LINEAR EQUATIONS

A SEMINAR on "Iterative Solution of Linear Equations" was held at the National Physical Laboratory, Teddington, during September 25-27, 1963. More than a hundred visitors from industry, universities, technical college research departments, and Government service participated in the programme of eight lectures on fundamental theory, four shorter contributions on the effective use of computers in practical problems, and informal discussion periods.

During the past fifteen years an immense amount of research has been undertaken on iterative methods for solving large sets of linear algebraic equations—principally in response to the needs of nuclear engineering—and concepts are now available whereby the main results can be related conveniently to each other. An elegant textbook on the subject, by Prof. R. S. Varga of the Case Institute of Technology, Ohio, had been published (*Matrix Iterative Analysis*, Prentice-Hall, London, 1963), and it was appropriate to signal its appearance by a meeting which would present a survey of recent work to persons directly concerned with the subject in Britain. Such was the purpose of the seminar organized by the Mathematics Division of the National Physical Laboratory as part of its programme to promote the exchange of information on computer applications.

The participants assembled after lunch on September 25 and were welcomed by the deputy director of the Laboratory, Dr. J. V. Dunworth. Dr. M. S. Lynn of the National Physical Laboratory then spoke on "Basic Concepts of the Theory of Iterative Methods". His talk covered the matrix definition of point and block over-relaxation and the dependence of over-relaxation theory on the classical Jacobi and Gauss-Seidel methods; the distinction between asymptotic and average rates of convergence; the basic Perron-Frobenius theorems for non-negative matrices; the properties of matrices which are cyclic of index k ; and the Stein-Rosenberg and Ostrowski-Reich theorems and their corollaries applicable to irreducible M -matrices.

The other paper of the afternoon was "Discretization of Elliptic and Parabolic Partial Differential Equations Consistent with Iterative Theory" by A. R. Curtis of the Atomic Energy Research Establishment, Harwell. Discussed here was the general parabolic boundary problem

in one space variable with interfaces, and its discretization by the integration method to provide an irreducible M -matrix, the Jacobi matrix of which has many of the properties described by Dr. Lynn. (The Taylor expansion and the variational methods of discretization were seen to be less satisfactory in this respect.) The self-adjoint problem in more than one space variable was shown also to lead to a real, symmetric matrix to which a large number of theoretical results are applicable.

The lectures of the following day began with "The Theory of Successive Over-relaxation", by Dr. Joan Walsh of the University of Manchester. Young's Property A and consistent ordering were defined; the form and eigenvalues of the iteration matrix, and an expression for the over-relaxation parameter were given for cyclic matrices of index k ; and these results were extended to block relaxation.

Dr. H. E. Wrigley of the Atomic Energy Research Establishment, Winfrith, followed with "Chebyshev Accelerated Methods". The relevance of Chebyshev polynomials was demonstrated, and for cyclic Hermitian matrices of order 2 and for non-cyclic matrices the convergence rates of the associated iterative methods were compared with those of over-relaxation. The case of non-Hermitian matrices was examined and definitions of optimum convergence presented, but the effectiveness of the acceleration technique was shown to depend critically on the information available on the eigenvalue distribution.

The first afternoon lecture was "The Estimation of Relaxation Parameters in Successive Over-relaxation", by B. A. Carré of the University of Southampton. The optimum parameter depends critically on the spectral radius of the Jacobi matrix, and methods of determining this quantity accurately were compared in detail. Special attention was directed to Neumann problems: these are often troublesome, but little information has been published about them.

D. E. Jones of the Meteorological Office, Bracknell, then described "Alternating Direction Implicit Methods", which have been highly successful with the self-adjoint reactor flux equation. The matrix is separated into two components, each of which is similar to a tridiagonal Stieltjes matrix; and when these components commute, a number of theorems guarantee the convergence of the