H. D. Barrs' review of methods for determining tissue water deficit which is probably the most comprehensive and authoritative account of its kind in the current literature.

Volume two commences with a chapter on water consumption by agricultural plants, outlining the long history of the subject and dealing with evapotranspiration in different climates and with different crops (M. E. Jensen). Water consumption by forests is discussed by A. J. Rutter in a chapter which shows the tremendous progress in this difficult field during the past two decades.

A. S. Craft's review of the effects of water deficit on physiological processes is followed by more detailed accounts of its influence on the growth of herbaceous plants (C. T. Gates) and trees (R. Zahner). These chapters give a useful summary of the present state of knowledge, and the section on tree growth includes information which may be new to many physiologists. The final chapter by P. W. Talboys on water deficit in vascular disease also breaks new ground for many readers.

I have few serious criticisms of these books, most of the authors having contributed reviews which will remain sources of reference for some years to come. It is perhaps unfortunate that the section on tissue water deficit methodology could not have been accompanied by an equivalently comprehensive survey of soil water deficit methodology. This was briefly reviewed in Gardner's chapter, but for the methods readers are largely referred to another publication. Another very minor criticism is the lack of cross-references between chapters, but this is offset by otherwise excellent indexing and self-explanatory tables of contents at the beginning of each volume and the head of each chapter.

The editor and publishers must be congratulated on their achievement, but why must these books be so expensive that most of us will take them only from library shelves?

J. R. ETHERINGTON

STOCKS AND STRAINS

Experiments in Microbial Genetics

Edited by R. C. Clowes and W. Hayes. Pp. xii + 244. (Blackwell (Scientific): Oxford and Edinburgh, 1968.) 42*s*.

ANYONE who has to prepare practical classes in microbial genetics will bless this book, for here are thirty-seven classical experiments, all set out and ready to be done. Mutation, transformation, DNA–RNA hybridization, biochemical genetics, virulent and temperate phage, plasmids, conjugation and *Aspergillus* are all covered. Each experiment has subheadings "requirements", "method" and "conclusions" with enough references to link it to the literature. But what distinguishes this book as a laboratory guide is the degree of detail provided by the seven authors. Not only are you told how many ml. of this or mg of that to have ready but, as well as details of the strains and their stock numbers, there is an international registry of laboratories ready to provide the right cultures and phages and a directory of laboratory suppliers. Like a good cookery book—which this somewhat resembles, with its bright cardboard covers and white double-spiral binding—this leaves nothing to chance. It would take real perversity not to bring off these experiments as successfully as the students on the courses run by the MRC Microbial Genetics Research Unit where all these details were first worked out. Students apart, many practising geneticists will find a mass of useful information here, not least the long pedigrees of *K*12 mutants which, curiously enough, include almost everything but the source of *K*12 itself (for this, see *Nature*, **217**, 1000; 1968). All in all, this compendium of techniques will be indispensable to everyone working in the field.

G. G. MEYNELL

Obituaries

Dr G. Francis

DR GORDON FRANCIS, group leader at the Culham Laboratory, died at his home in Abingdon on Saturday, January 4, at the age of 44.

After wartime experience at the Admiralty Signals Establishment, Francis took a first in physics at Swansea. From 1948–58 he worked at the Clarendon Laboratory, Oxford, studying high frequency electrodeless discharges, first as a pupil of and later in collaboration with Dr A. von Engel. Francis joined Harwell in 1958 and from then until his death he worked on plasma physics problems connected with the Atomic Energy Authority's programme on controlled thermonuclear reactions. He moved with his group to the Culham site in 1962.

Francis showed his experimental skill when he made the first measurements of the discharge current during the breakdown phase of a high frequency discharge. In 1956 he wrote a classic review of the glow discharge, and his book *Ionization Phenomena in Gases* (1960) is widely used. During his time with the Atomic Energy Authority, his chief interest was in the containment of hot plasmas by magnetic mirror systems. By 1964 he and his group were able to report results which showed clearly the increased stability of systems in which the magnetic field strength increases in all directions away from the plasma. This confirmed earlier work by the Soviet physicist, M. S. Ioffe, using very different methods of plasma production. Francis and his colleagues then built a new apparatus with the aim of increasing the ratio of the energy density in the plasma to that in the magnetic field. This experiment is still unfinished, but in his last paper Francis and his colleagues described preliminary measurements showing that a much higher plasma pressure had indeed been obtained without any apparent loss of stability. During this time, Francis's other research included pioneer work on radiofrequency confinement of plasma and on plasmas produced by the action of laser light on solid hydrogen particles.

Francis's work, both on gas discharges and in plasma physics, was internationally recognized and he became particularly well known for the clarity of his lectures. He played a key part in the production of the film "Power from Fusion", parts I and II, and also took part in television and radio programmes.

Mr H. Gilbert-Carter

HUMPHREY GILBERT-CARTER, director of the University Botanic Garden, Cambridge, from 1921 to 1950, died on January 4 at his home in Dawlish, Devon, at the age of 84.

After gaining a medical degree at the University of Edinburgh, Gilbert-Carter went to Trinity College, Cambridge, in 1909 to work as an advanced student in the Botany School under C. E. Moss, who was at that time one of the leading teachers in the new science of plant ecology. From these early days, he showed great interest in the work of continental botanists; travelling widely as a student, he developed a life-long affection for north-west Europe and Denmark in particular, and a deep knowledge of the important contributions being made by systematists of the Englerian school and ecologists such as Warming and Raunkiaer. (His *Genera of British Plants* (1913) introduced British botanists to the Englerian system, and his excellent translation of Raunkiaer's *Plant Life Forms* (1937) brought to a much wider audience

this work of international importance.) This European view of botany was of quite exceptional value to the development of the science in Cambridge, and its effects are still, happily, evident to the present day. It is indeed arguable that much of the inspiration behind the *Flora Europaea* project stems from the Gilbert-Carter influence, which produced from Cambridge generations of enthusiastic and outward looking botanists who enjoyed field botany, international scientific contacts and the challenge of foreign languages.

Following his Cambridge student career, Gilbert-Carter spent seven years as economic botanist to the Botanical Survey of India, returning to the post of director of the Cambridge Botanic Garden, where his knowledge and enthusiasm for tropical plants (and oriental languages) were to be so effectively used in teaching. His *Descriptive Labels for Botanic Gardens*, published in book form in 1924, contained uniquely erudite and charming notes, and many are still in use today. Much of this learning went also into his *Guide to the University Botanic Garden* published in 1922, with a revised edition in 1947.

For many years Gilbert-Carter combined his duties at the Botanic Garden with the teaching of systematic botany in the department, and it was here that his qualities of personality were so remarkably effective. He practised, naturally and without strain, that fundamental technique of the gifted teacher; his pupils were instructed in the delightful game of learning by an enthusiast who could not prevent his interest in people, or his love of botany, from shining through, however dull the day or tedious the textbook. This quality pervades his published works designed primarily for his students, particularly the charming *Catkin-Bearing Plants* (1930) with its classical allusions so evocative of the idyllic Cambridge scene, the excellent *British Trees and Shrubs* (1936) still in use today in the Cambridge teaching, and his last book, *Glossary of the British Flora* (1950, third edition, 1964).

All his pupils will recall their own favourite stories of Humphrey, for he was that exceptional teacher around whom stories and legends accreted during his lifetime. The appeal of such stories is esoteric and largely incommunicable; but wherever his pupils meet, it is quite inevitable that they will say, as he himself did when he noticed the attention of his students straying . . . "I shall now tell you an anecdote". If the Oxbridge tradition is to mean anything in "education, religion, learning and research" in the future, it will be, surely, in terms of this special blend of devoted scholarship and personal integrity shown by the career of Humphrey Gilbert-Carter.

S. M. WALTERS

University News

Professor H. Z. Mellins, State University of New York College of Medicine, has been appointed professor of radiology at **Harvard University** and director of the Division of Diagnostic Radiology at the Peter Bent Brigham Hospital.

Professor L. Fishman, University of Colorado, has been appointed to the chair of economics at the **University of Keele.**

Professor F. E. Stock, professor of surgery, has been appointed dean of the Faculty of Medicine at the **University of Liverpool.**

Dr E. C. D. Cocking has been appointed to the chair of botany and head of the Department of Botany in the **University of Nottingham.** Dr Cocking succeeds **Professor C. G. C. Chesters.**

Dr G. M. H. Waites, Sydney, has been appointed to a second chair in the Department of Physiology and Biochemistry in the **University of Reading.**

Mr Donald Woods has been appointed Wayne Kerr professor of measurement science at the **University of Surrey.** **Mr C. Robinson** has been appointed professor of economics in the Department of Humanities and Social Sciences.

Appointments

Professor Henry Harris, professor of pathology at Oxford, has been appointed a member of the **Agricultural Research Council** in succession to **Professor J. E. Harris,** who died in June 1968.

Announcements

Sir Frederick Bawden, director of Rothamsted Experimental Station, has been elected as president of the Institute of Biology for 1969 in succession to **Mr H. J. Bunker. Professor D. J. Crisp** and **Professor G. Pontecorvo** have been elected as vice presidents.

The **Gold Medals** of the **Royal Astronomical Society** have been awarded to **A. T. Price,** formerly professor of mathematics in the University of Exeter, in recognition of his work on geomagnetism, especially for his studies of the electrical conductivity in the interior of the Earth, and to **Professor Martin Schwarzschild,** Higgins professor of astronomy at Princeton University, for his contributions to several important branches of astrophysics, including the theory of stellar evolution and the observation of the Sun, stars and planets from high altitude. The **Eddington Medal** has been awarded to **Dr A. Hewish,** University of Cambridge, in recognition of the discovery of the pulsating radio sources, now known as the pulsars.

The Henry L. and Grace Doherty Charitable Foundation has donated $7,000,000 to the **Lamont Geological Observatory** of Columbia University, the name of which is to be changed to the **Lamont-Doherty Geological Observatory.**

The Trustees of the **Lady Tata Memorial Trust** invite applications for fellowships, scholarships and grants for research on leukaemia in the academic year beginning October 1, 1969. Further information can be obtained from the Secretary of the Scientific Advisory Committee, Lady Tata Memorial Trust, Chester Beatty Research Institute, Fulham Road, London SW3.

The **British Joint Corrosion Group,** the **Corrosion and Protection Association** and the **Institute of Corrosion Technology** have set up a joint committee called the National Council of Corrosion Societies. Each society will be represented by two members, and the council will be concerned with British representation in the international corrosion organizations and also with the coordination of the activities of the three societies in the UK.

International Meetings

August 31–September 6, **Phenomena in Ionized Gases,** Bucharest (The IXth International Conference on Phenomena in Ionized Gases, C.P.—3082 Bucharest, Romania).

September 1–5, **Mathematical Models of Manpower Systems,** Lisbon (Scientific Affairs Division, NATO, Brussels 39, Belgium).

September 1–5, **Neurochemistry,** Milan (Professor Rodolfo Paoletti, Scientific Secretary, c/o Institute of Pharmacology, University of Milan, Via Andrea del Sarto 21, 20129 Milan, Italy).

September 1–6, **Water Supply Congress and Exhibition,** Vienna (Secretary General, 34 Park Street, London W1).

September 2–5. **Corrosion of Concrete Reinforcement and its Prevention,** Prague (Dr Oldrich Valenta, c/o Building Research Institute, Technical University of Prague, Solinova 7, Prague 6 Dejvice, Czechoslovakia).