trollable factors, *i.e.* time, hydrogen ion concentration, temperature, purity and concentration of reagents, stains.

The subject is covered in 21 sections, as follows: Microscopy; Equipment; Fixation; Decalcification; Sectioning; Stains and Staining; General Staining and Mounting Procedures; General Oversight Methods; Nuclear Stains; Cytoplasmic Granules; Enzymes; Endogenous Pigments; Exogenous Pigments and Minerals; Various Cell Products; Fats and Lipoids; Connective Tissue Fibers; Fibrin, Bacteria, Protozoa, and Other Parasites; Glia and Nerve Cells and Fibers; Hard Tissues; Various Special Procedures; and Buffers and Buffer Tables. The author throughout carefully specifies the Color Index Numbers of the stains and also the reference standards of purity of essential chemical reagents otherwise called for in his methods. A very useful series of tables for the preparation of buffer solutions is included. In so far as is possible, the rationale for procedures and the modification of old methods is indicated. The book is made a practical and workably integrated unit by virtue of many cross references. It is excellently indexed.

This treatise on histopathologic technic will satisfy a need long felt by many pathologists and histologists alike.

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Annual review of microbiology. (Vol. 1.) C. E. Clifton. (Ed.) Stanford, Calif.: Annual Reviews, 1947. Pp. vii + 404. $6.00.

This first volume is an attempt to provide a résumé of current research in the field of microbiology. It appears to be a critical evaluation of a wide range of subject matter including viruses, rickettsiae, bacteria, fungi, and protozoa, as well as some of their biological processes.

It is commendable that an annual review of this field has been started. Researchers now may have the opportunity to obtain a broad, comprehensive viewpoint in the working relationships of the various organisms.

There are 17 different subjects represented: Morphology and Cytology of Protozoa, Antigenic Variation in Protozoa and Bacteria, Life Cycle of Malarial Parasites, Variation in Phytopathogenic Fungi, Variation in Phytopathogenic Viruses, Some Aspects of the Problem of Growth Factors for Protozoa, Bacterial Metabolism, Nitrogen Metabolism, Industrial Fermentations, Quaternary Ammonium Compounds, Antibiotics, Chemotherapeutic Agents, Immunochemistry, Some Aspects of Active Immunization, Medical and Epidemiological Aspects of Enteric Infection, The Rickettsiae, and Respiratory Viruses.

Each of the 17 sections in this book is written by a contributor or contributors who have had personal experience with the particular subject. The editors have done an excellent job in their choice of contributors. The various authors have done exceptionally well with their assignments although somewhat handicapped for the sake of brevity. Each section is well documented by a good working bibliography. This will be extremely helpful for those who desire to obtain more information concerning the subject.

The volume concludes with an author and subject index totaling approximately 20 pages. Students and workers interested in the various aspects of microbiology will find this book a helpful and useful addition to their library.

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Kampen mot Ogräset, 1935–1946. ("Weed control experiments.") Hugo Osvald. (Ed.) (Publications from the Institute of Plant Husbandry, Royal Agricultural College of Sweden, No. 2.) Uppsala: Almquist & Wiksells, 1947. Pp. 318. (Illustrated.) 25 kr.

This volume of 18 papers presents the results of 12 years of weed control research at the Royal Agricultural College of Sweden. The type and scope of these investigations are worth noting since weed research programs are now expanding rapidly along many lines. All of the papers are of high technical quality, and space permits a review of only a limited number of them—principally those concerned with weed biology. Although Swedish is the language used, excellent English summaries are included, and all illustrations and tabular material are provided with English translations.

Two papers on germination biology, by von Hofsten and by Kolk, are here considered together. These concern after-ripening, storage, and the influence of light (especially different daylight intensities), temperature, and moisture on the germination of weed species in 21 genera, many of which are common weeds in this country. Freshly harvested seeds of *Matricaria inodora* germinated well in light, but, as they became older, the germinative capacity in darkness increased. Old seeds of *Thlaspi arvense* germinated only under fluctuating temperatures. Light retarded the germination of both light brown and dark brown seeds of *Sinapis* (*Brassica*) *arvensis* when they were exposed to fluctuating temperatures. On the soil surface the light brown seeds germinated less well than the dark brown. Seeds of *Avena fatua* germinated at a temperature as low as 2° C. Freshly harvested seeds of *Chenopodium album* did not germinate at all, while older seeds did germinate, and about 5 or 6 times as well in darkness as in light.

Kolk notes that the effect of light is modified by the age of the seeds. Four groups are recognized: (1) species in which young seeds germinate well in bright daylight and old seeds well in weak daylight (e.g. *Cirsium arvense*), (2) species that germinate well in weak daylight (e.g. *Capsella bursa-pastoris*), (3) species that germinate well in weak daylight or darkness (e.g. *Stellaria media*), and (4) species whose young seeds are unaffected by light, while older seeds germinate well in weak daylight (e.g. *Agrostemma Githago*). Varying temperatures (between 5° and 22° C) favor the germination of most of the species studied (e.g. *Sinapis arvensis*) as compared with constant temperatures (20°–22° C). For most of the species the optimum of germination, in weak daylight as well as in darkness, was found at a water content in the substrate (sandy soil rich in humus) of 60% of the maximum water capacity. At 30% of the maximum