

The temperature of storage must be below -60°C for tissues impregnated with Eagle's solution containing less than 45% glycerol and below -130°C whenever the concentration of glycerol is higher.

Practical applications (tissues and organ banks) and the possibility of congealing and storing whole animals without harm are discussed.

M. WELSCH

Antibiotics in Medicine. L. P. GARROD (Editor). British Medical Bulletin **16**, No. 1, 1960. The British Council, London, 1960. 20s.

THE monograph: *Antibiotics in Medicine*, prepared under the eminently competent scientific editorship of Professor L. P. Garrod, devotes an introduction and fifteen papers, written by well-known specialists to the basic and practical problems of antibiotics. It will be of the highest value to the clinician wishing to make a rational therapeutic and prophylactic use of the numerous now available anti-infectious drugs.

Four chapters are of especial interest to the biochemical pharmacologist.

In the first one, "Chemistry and classification of antibiotics", E. P. Abraham and G. G. F. Newton, show how it is now possible to group the many known antibiotics into natural families on the basis of either their chemical structure or the mechanism of their biosynthesis.

The second one, by E. F. Gale, deals with the "Selective toxicity of antibiotics". It gives a clear and up-to-date picture of what is known of the modes of action of antibiotics at the molecular and cellular levels: inhibition of cell-wall synthesis by penicillin, cycloserine and bacitracin, gross cell-permeability alterations by surface-active antibiotics such as tyrocidin and polymyxin, interference with protein synthesis by chloramphenicol and the tetracyclines.

In the third one, "Drug resistance and mechanisms for its development", M. R. Pollock, first briefly describes the biochemical peculiarities that can be held responsible for microbial drug-resistance. He next discusses the respective roles of biological mechanisms that can conceivably induce more or less stable changes in individual bacteria and therefore, thanks to natural selection, promote population changes: enzymic induction and genic alterations such as gene mutation and gene recombinations of various kinds.

The last one, by J. M. Robson and G. A. H. Buttle deals with "The pharmacology of antibiotics". Perforce, since our knowledge is yet rather limited, the biochemical aspects are less stressed than in the other papers.

M. WELSCH

Glutathione. E. M. CROOK (Editor). Biochemical Society Symposium No. 17. Cambridge University Press, 1959. 116 pp., 15s.

EVER since Hopkins isolated pure glutathione nearly 40 years ago, the elucidation of the function of this ubiquitous substance has posed considerable problems. Some of the latest views on possible roles for glutathione were discussed at a Biochemical Society Symposium held in London in February, 1958.

The first two articles deal with the chemistry and methods of determination and are by F. A. Isherwood on the "Chemistry and biochemistry of glutathione" and by C. G. Thomson and H. Martin on "Techniques for determining glutathione in animal tissues". The next two sections are concerned with possible metabolic roles for glutathione in plants and animals: "Enzyme systems associated with the oxidation and reduction of glutathione in plant tissues" by L. W. Mapson and "Glutathione metabolism in animals" by P. C. Jocelyn. In these articles particular reference is made to the oxidation/reduction of glutathione, its coupling with TPN and with vitamin C, and to the role of glutathione as a coenzyme.

The remaining three sections are concerned with more specialized aspects of glutathione metabolism: "Glutathione and neural tissues" by H. McIlwain, "Glutathione and its analogues in the lens" by S. G. Waley, and "Thiols and radiation damage" by D. B. Hope. The latter article, as its

title suggests, includes a general discussion on —SH compounds, including —SH proteins, in their controversial role as primary targets in radiation damage.

The problem of collating the various possible functions of glutathione is clearly not yet finally solved but considerable progress has been made. The symposium may be strongly recommended to the many biochemists who must be interested in the vital functions of —SH compounds.

E. D. WILLS

G. F. GAUSE. **The Search for new Antibiotics** Yale University Press, 1959, pp. 97, \$4.75.

THE problem of coping with an expanding scientific literature is further complicated by the need for making up a deficit in our knowledge of Soviet research of the past two decades. Books such as GAUSE's will acquaint American and European scientists with the achievement and orientation of Russian Institutes. A lecture delivered at Yale University in 1959 forms the basis of this volume. It is a summary statement of some work at the Institute of Antibiotics in Moscow relating to the ecology of antibiotic-producing microbial species, and a more detailed account of the use of mutants with impaired respiration in the selection of anti-neoplastic chemical agents. GAUSE presents evidence that mutant microorganisms with deficient respiration and altered cytochromes are uniquely sensitive to carcinostatic chemicals. This relationship permits a screening technique for antibiotic and synthetic chemicals which is correlated with the effectiveness of the compounds on mammalian tumors. Underlying this work is the postulate that mutant microorganisms with impaired respiration are the biological equivalents of mammalian neoplastic cells. The utility of the empirical relationship remains to be determined, and the biochemical mechanisms which define the relationship are described only in general terms within the restricted parameter of respiration. However, this provocative essay gives the experimental basis of a development in screening technology which may assume considerable importance in the search for agents which selectively inhibit neoplasms.

C. E. CARTER

E. KELEMEN: **Permeability in acute experimental inflammatory oedema in the light of the action of salicylates**. Publishing House of the Hungarian Academy of Sciences, Budapest, 1960. 256 pp.

KELEMEN étudie depuis 10 ans les facteurs qui conditionnent le développement de l'oedème provoqué par l'administration dans la patte du rat d'un extrait de testicule, riche en hyaluronidase. La pathogénie exacte de cet oedème reste encore ignorée. Elle ne dépend pas d'une libération ni d'histamine ni de 5-hydroxytryptamine, mais bien d'une atteinte primitive des capillaires et des membranes basales.

L'action des salicylés sur le développement de l'oedème est conditionnée par la présence des glandes surrénales. Ainsi les salicylés agissent par l'intermédiaire d'un facteur hormonal, encore mal défini. Des interrelations entre cortex et médulla sont en outre démontrées.

L'extension de ces conclusions à la thérapeutique clinique par salicytés à fortes doses semble malaisée. Bien que l'intoxication aiguë par salicylates entraîne certainement une réponse cortico-surrénale, pour Kelemen pareille stimulation ne paraît pas survenir lors des cures chroniques.

Outre ces facteurs endocriniens, des modifications de la circulation locale, du métabolisme tissulaire *in situ*, et de l'équilibre hydro-minéral, l'administration d'adrénaline (et non de noradrénaline) peuvent également influencer le développement de l'oedème.

L'administration des salicylés influence chacun de ces facteurs. Ces altérations d'origine pharmacodynamique ont été considérées en détail, en particulier chez l'homme. De l'examen de ces données, l'auteur établit qu'il existe une relation entre les propriétés anti-inflammatoires (en particulier des salicylés) d'une part et d'autre part ce qu'il définit comme l' "hypergie", c'est-à-dire une altération des échanges hydro-minéraux associée à une utilisation tissulaire insuffisante d'énergie métabolique.

Le travail de Kelemen représente une contribution importante à la connaissance de la pharmacologie des salicylés et des mécanismes de l'inflammation.

L'action des salicylés apparaît fort complexe, s'expliquant par une stimulation cortico-surrénalienne, par des interactions médullocorticales et par des facteurs métaboliques tissulaires plus généraux, tels que l'utilisation inadéquate des composés phosphorylés à haute teneur énergétique.