

WALLENFELS discusses hydrogen transfer by the nicotinamide residue in detail. He uses chemical reactions as models, and some biochemists may wish that the material had been more clearly arranged. Evidence is presented that in those reactions most like enzymic ones, the transfer is of a hydrogen nucleus with an electron pair (i.e. a hydride ion) rather than of a radical or of free electrons. Wallenfels also mentions possible binding mechanisms of the coenzymes with certain dehydrogenases.

KAPLAN follows with a masterly article. After skimming past α -DPN and the neat evidence that it contains the α -ribosidic bond, he reviews L- and D-lactic dehydrogenases from bacteria and animals, and their reactions with coenzyme analogues. Interestingly the two enzymes from *Lactobacillus arabinosus* transfer hydrogen to the same side of the pyridine ring of the coenzymes although to different sides of the pyruvic acid. Finally KAPLAN checks the relationships between fishes, on the basis of the relative behaviour of their heart lactic dehydrogenases with coenzyme analogues.

TALALAY and LEVY lead their readers adroitly through the maze of properties of the steroid dehydrogenases to their determinations of the equilibrium constants of several of the reactions. The surprise is that, whereas in the 5α (rings AB flat) and 5β (rings AB bent) androstane series oxidation of 3α - and 3β -hydroxyls requires, as expected, less energy (by about 1 kcal/mole) when the hydroxyl is axial rather than equatorial, no such difference is found when the molecules bear a $-\text{CO}\cdot\text{CH}_2\text{OH}$ side chain at position 17 at the far end of the molecule. Can this group affect the conformation of ring A three rings away?

PRELOG, in whose honour the meeting was arranged, chooses the reduction of decalones as simpler substrates than steroids. Again we are guided through a variety of microbiological reactions to a simple hypothesis at the end. This states that steric course of the reduction is determined by the larger side of the ketone being compelled to approach from the side away from the $-\text{CO}\cdot\text{NH}_2$ group of the coenzyme when the oxygen of the ketone points towards the ring nitrogen of the coenzyme. Discussion follows whether this might be a purely steric effect or an orientation of both substrate and coenzyme between polar and nonpolar regions of the enzyme.

The whole booklet gives a fascinating glimpse into an exciting part of biochemistry. The Editors are to be congratulated on the most helpful cross references between the different articles. Could they be asked to read Fowler on hyphens before allowing "nucleic acid-containing particles"? The book is to be praised for the speed of its appearance (the meeting was in March 1959) and for its reasonable price.

H. B. F. DIXON

Medizinische Grundlagenforschung: Edited by K. F. BAUER. Vol. II, pp. 827, 168 DM.

DAS Buch ist der 2. Band einer Schriftenreihe, die den Mediziner in Forschung, Klinik und Praxis über den wissenschaftlichen Fortschritt auf den verschiedensten aktuellen Gebieten in kurzer und verständlicher Form unterrichten soll. Die einzelnen Beiträge sind in sich geschlossen und von hervorragenden Sachkennern geschrieben. Sie nehmen eine Mittelstellung ein zwischen Übersicht und Originalarbeit.

Der vorliegende 2. Band enthält 17 voneinander unabhängige Beiträge. Im ersten Kapitel behandelt O. SCHAUMANN den Schmerz als physiologisches und pathologisches Phaenomen. Der folgende Beitrag von R. GRANIT ist der Steuerung der Körperhaltung durch tonische Hemmungen von der *Formatio reticularis* gewidmet mit besonderer Berücksichtigung der Gamma-Neuronen. Die "Physiologie der markhaltigen Nervenfasern" ist von H. C. LÜTTGAU, Bern, mit 30 hervorragenden Abbildungen meisterhaft dargestellt. Dieser Beitrag, der die erfreulich eng gewordenen Beziehungen zwischen Physiologie und Pharmakologie zur Grundlage hat, verdient Bewunderung. Schon recht speziell ist das Kapitel von E. C. CROSBY, T. HUMPHREY und M. J. SHOWERS über die supplementären motorischen Rindenregionen. Anschliessend gibt E. HAGEN, Bonn, eine mit vielen guten Abbildungen versehene Übersicht "über morphologische Veränderungen vegetativer Nervenzentren bei pathologischen Vorgängen". Nach einer kurzen allgemeinen Darstellung der Zellenlehre und der Zellulär-Pathologie unter neuen Aspekten von K. F. Bauer und E. MÜLLER berichtet T. ASTRUP über die Fibrinolyse und Thrombolyse. E. RUTISHAUSER, R. LAGIER und E. GRASSET liefern neue Beiträge aus der Arthrose- und Arthritis-Forschung. Die Pathologie der Endocarditiden ist von G. BOMPIANI und A. ASCENZI behandelt. Grosses Interesse wird der Beitrag von V. BECKER über Wirkungen des äusseren und inneren Sauerstoffmangels finden. Dasselbe gilt für die Biochemie der Entzündung,

die von R. MEIER (43 Seiten Literatur bei 34 Seiten Text) behandelt wird. Durch Klarheit und Vollständigkeit ausgezeichnet ist die schöne Übersicht über cancerogene Stoffe von N. P. BUU-HOI. Anschliessend berichten G. DOMAGK, L. JÜHLING und J. PÜTTER über Probleme der Chemotherapie bei Tumoren besonders mit Bayer E 39 und J. VONKENNEL und M. SCHOOG über die Chemotherapie der Hautkrankheiten. Nach kurzen Beiträgen über Zell-Elektrophorese von G. RUHENSTROTH-BAUER und P. SACHTLEBEN und über Vitamin B₁₂-Analoga von W. FRIEDRICH und K. BERNHAUER schliesst das Buch mit einer recht interessanten Abhandlung von R. HAASE: "Strukturbildung in der Natur und der 2. Hauptsatz der Thermodynamik" und betont damit wohl bewusst die naturwissenschaftliche Grundeinstellung.

Die wissenschaftliche Qualität der einzelnen Beiträge ist durchweg gut. So gibt das Buch dem Leser die willkommene Möglichkeit, sich in kurzer und klarer Form von berufenen Sachkennern über die wichtigsten Fortschritte der Forschung unterrichten zu lassen. Ein solches Buch hat gefehlt, so dass man den Autoren, dem Herausgeber und dem Verlag für ihre Arbeit nur danken kann.

H. DRUCKREY

Ciba Foundation Symposium on Regulation of Cell Metabolism. Edited by DR. G. E. W. WOLSTENHOLME. J. and A. Churchill Ltd., London, 1960. pp. 387, 52s. 6d.

THIS is an account of an enthralling Symposium planned and directed by Sir Hans Krebs with the cooperation of Professor Dickens as a result of a conversation between Professor Martius, Professor Lynen and Sir Hans Krebs. It is the result of papers by sixteen authors followed by an account of the discussion of these papers. Thirty-one persons attended and took part in this Symposium.

It commences with a Chairman's introductory address on the rate-limiting factors in cell respiration in which there is a consideration of how tissues such as cardiac muscle, showing great variations in the rate of respiration, all the changes from rest to activity, nevertheless can manage the consequential variations in a way in which factors other than hormonal may be involved. It deals with the reactions between oxygen and substrates involving such factors as iron porphyrins, flavoproteins and pyridine nucleotides. It points out the importance of feed-back systems in control. It is interesting that this mechanism has now become generally accepted in biochemistry, as it is one that was clearly enunciated by Sherrington in regard to reflex activity many years ago. The address by Krebs is followed by one by Siekevitz on the meaning of intracellular structure for metabolic regulation. He brings out well the various problems involved in the recent knowledge of the structure of mitochondria and of cytoplasm, in pointing out the modern views on the division of cytoplasm into numerous compartments. Clearly in matters of regulation the incidence of these barriers must be very thoroughly considered, and a similar aspect is discussed by De Duve.

E. C. Slater and W. C. Hülsmann deal with the respiratory chain and the relation to this of ADP. Aspects of control of oxygen utilisation are discussed by Britton Chance with a full account of his fascinating techniques for investigating reactions occurring in seconds, and his solution of many simultaneous equations.

A. Lehninger and colleagues discuss control points in phosphorylating respiration and the action of a mitochondrial respiration release factor. In this they delineated the effects of various uncoupling reagents. F. Dickens and colleagues have made a large contribution to the discussion, on various oxidative pathways of carbohydrate metabolism dealing, in addition to normal pathways, with the glucuronate pathway and the pentose phosphate pathway. Lipmann and colleague discuss glycogen synthesis in muscle. Martius deals with electron transport and is followed by a series of papers upon the control of glycolysis by Racker, Potter, Lynen and Holzer. It would be invidious to pick out special points of interest in this wide appreciation of the subject; that on triphosphopyridine nucleotide by Potter and Niemeyer, and the regulation of the Pasteur effect by phosphorylation reactions in relation to the exhaustion of the inorganic phosphate by Lynen seem very significant.

The Symposium finished with papers on the automatic adjustment mechanisms in bacterial cells by Dean and Hinshelwood, and control of growth of the bacterial cell by Magasanik *et al.*

The theme of the Symposium in its insistence upon looking at the reactions in the cell as a whole is admirable and provides much food for thought. In the past biochemists have been concentrating naturally upon the behaviour of isolated enzymes. The time has now come when a more forward attempt may be made to put these together and an oversight of these papers makes fairly clear what a