

Monographs on Biochemistry

**THE NATURE
OF
ENZYME ACTION**

**BY
SIR W. M. BAYLISS, M.A., D.Sc., F.R.S.**

MONOGRAPHS ON BIOCHEMISTRY

EDITED BY

R. H. A. PLIMMER, D.Sc.

AND

J. HOPKINS, M.A., M.B., D.Sc., F.R.S.

GENERAL PREFACE.

THE subject of Physiological Chemistry, or Biochemistry, is enlarging its borders to such an extent at the present time that no single text-book upon the subject, without being cumbrous, can adequately deal with it as a whole, so as to give both a general and a detailed account of its present position. It is, moreover, difficult, in the case of the larger text-books, to keep abreast of so rapidly growing a science by means of new editions, and such volumes are therefore issued when much of their contents has become obsolete.

For this reason, an attempt is being made to place this branch of science in a more accessible position by issuing a series of monographs upon the various chapters of the subject, each independent of and yet dependent upon the others, so that from time to time, as new material and the demand therefor necessitate, a new edition of each monograph can be issued without reissuing the whole series. In this way, both the expenses of publication and the expense to the purchaser will be diminished, and by a moderate outlay it will be possible to obtain a full account of any particular subject as nearly current as possible.

The editors of these monographs have kept two objects in view: firstly, that each author should be himself working at the subject with which he deals; and, secondly, that a *Bibliography*, as complete as possible, should be included, in order to avoid cross references, which are apt to be wrongly cited, and in order that each monograph may yield full and independent information of the work which has been done upon the subject.

It has been decided as a general scheme that the volumes first issued shall deal with the pure chemistry of physiological products and with certain general aspects of the subject. Subsequent monographs will be devoted to such questions as the chemistry of special tissues and particular aspects of metabolism. So the series, if continued, will proceed from Physiological Chemistry to what may be now more properly termed Chemical Physiology. This will depend upon the success which the first series achieves, and upon the divisions of the subject which may be of interest at the time.

R. H. A. P.

F. G. H.

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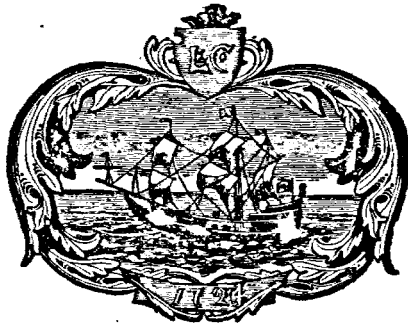
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BY
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FIFTH EDITION

LONGMANS, GREEN AND CO.
39 PATERNOSTER ROW, LONDON, E.C. 4
NEW YORK, TORONTO
BOMBAY, CALCUTTA AND MADRAS

1925

Made in Great Britain.

PREFACE TO FIFTH EDITION.

THE advance of knowledge has made it necessary to make some few corrections and additions to this edition. The most important of these relate to the methods of purification of enzymes and to the problem of equilibrium in heterogeneous catalysis.

It is hoped that no important new work has been omitted, and it is well to call attention to the fact that the whole of the subject-matter has been carefully revised.

W. M. B.

April, 1923.

The work of bringing this edition up to date had been completely performed before my father was overtaken by his illness in the summer of 1923. I have had, therefore, merely to correct the bibliography and index and prepare the manuscript for the press; no attempt has been made to include the advances made in the last eighteen months.

L. E. B.

October, 1924.

PREFACE TO FOURTH EDITION.

THIS edition has been brought up to date by the addition of some new paragraphs and references.

More especially, the chapter on the mode of action of enzymes has been rewritten under a new title, while the "Supplementary Notes" have been embodied in the text.

W. M. B.

April, 1919.

PREFACE TO THIRD EDITION.

A CONSIDERABLE amount of new matter has been added to this edition, and the continued discovery of further facts has rendered it necessary to revise certain paragraphs. At the same time, it has been possible to abbreviate the description of some other work which has shown itself unable to stand the test of renewed investigation.

Attention is particularly directed to the chapters on "Reversibility" and on the "Combination" between enzyme and substrate, as also to the section on anti-enzymes, which have, for the most part, been rewritten. It will be found that many important new discoveries have been made in these fields. The facts referred to have made some modifications necessary in the point of view taken in previous editions; but, for the most part, these are in the direction of simplification. It is satisfactory to note that the doctrine of the importance of surface phenomena, or adsorption, in the action of enzymes, advocated in these pages from the first, is becoming more and more widely recognised.

The use of the word "Nature" in the title of this monograph has been subjected to criticism. It is said that the "Nature of Enzyme Action" is not explained. My object is to compare the various activities grouped under the head of "enzymic" with those known as "catalytic". If it is found that their nature is the same, a group of facts is brought under the application of more general laws, and, as I understand it, that is what "explanation" in Science essentially is.

W. M. B.

UNIVERSITY COLLEGE, LONDON,
July, 1913.

PREFACE TO SECOND EDITION.

THE large amount of work on enzymes published in the short space of time since the first edition of this monograph was written necessitates the addition of much new matter.

The number of references in the Bibliography, in accordance with this increase in knowledge, has considerably increased.

In a few places some amplification has been thought desirable in order to render the meaning easier to understand.

Headings of paragraphs have been introduced. The reader will, I think, appreciate the lessening of the labour required to find what he may wish to refer to.

W. M. B.

PREFACE TO FIRST EDITION.

THIS short monograph is based upon lectures given at various times in University College, London, and this fact may serve as the excuse for what some may regard as too definite a position with respect to certain disputed questions. It is, I venture to think, preferable to take a definite point of view, rather than to leave the study of the subject in a state of chaos. At the same time, one must always be prepared to correct one's views when evidence is brought against them. I have endeavoured not to slur over difficulties, where such really exist; as also to indicate the existence of points of view contrary to my own. It is quite possible, however, that, by inadvertence or ignorance, important facts may have been omitted.

Certain subjects of considerable interest in connection with the theory of the action of enzymes, such as the properties of colloids and the laws of adsorption, which were dealt with in some detail in the lectures, are here only treated in their immediate bearing on the facts under discussion.

No attempt has been made to put forward a complete bibliography in the list of literature at the end. This contains only those writings which have a more or less direct bearing on the subject and which are referred to in the text. In this list I have added, after each reference, the page of the text in which it is made use of, so that the insertion of names of authors in the general index is rendered unnecessary.

The detailed description of the properties of the large number of specific enzymes already known finds no place in this monograph, which confines itself to general properties more or less common to all enzymes.

W. M. B.

CONTENTS.

CHAPTER	PAGE
I. CATALYSIS IN GENERAL - - - - -	I
II. ENZYMES AS CATALYSTS - - - - -	II
III. PHYSICAL AND CHEMICAL PROPERTIES OF ENZYMES - -	24
IV. GENERAL METHODS OF PREPARATION AND OF INVESTIGATION	43
V. REVERSIBILITY OF ENZYME ACTION - - - - -	54
VI. THE VELOCITY OF REACTION AND THE VARIOUS CONDITIONS AFFECTING IT - - - - -	79
VII. THE MODE OF ACTION OF ENZYMES - - - - -	116
VIII. CO-ENZYMES AND ANTI-ENZYMES - - - - -	150
IX. ZYMOGENS - - - - -	159
X. OXIDATION-PROCESSES AND CERTAIN COMPLEX SYSTEMS -	163
GENERAL CONCLUSIONS - - - - -	174
LIST OF LITERATURE REFERRED TO - - - - -	177
INDEX - - - - -	199

LIST OF LITERATURE REFERRED TO.

	Page of Text where reference is made.
ABDERHALDEN, E., and A. GIGON (1907), <i>Weiterer Beitrag zur Kenntniss des Verlaufs der fermentativen Polypeptidspaltung</i>	92
Zeit. physiol. Chem., 53, 251-79.	
ABDERHALDEN, E., and G. KAPFBERGER (1910), <i>Serologische Studien mit Hilfe der optischen Methode. XI. Parenterale Zufuhr von Kohlenhydraten</i>	41
Zeit. physiol. Chem., 69, 23-49.	
ABDERHALDEN, E., and H. PRINGSHEIM (1910), <i>Beitrag zur Technik des Nachweises intracellulärer Fermente</i>	44
Zeit. physiol. Chem., 65, 180-84.	
ABDERHALDEN, E., and P. RONA (1906), <i>Das Verhalten von Leucylphenylalanin u.s.w. gegen Press-saft der Leber vom Rinde</i>	76
Zeit. physiol. Chem., 49, 31-40.	
ABDERHALDEN, E., and A. SCHITTENHELM (1909), <i>Ueber den Nachweis peptolytischer Fermente</i>	52
Zeit. physiol. Chem., 61, 421-25.	
ABDERHALDEN, E., and E. STEINBECK (1910, 1), <i>Beitrag zur Kenntnis der Wirkung des Pepsins und der Salzsäure</i>	17
Zeit. physiol. Chem., 68, 293-311.	
ABDERHALDEN, E., and E. STEINBECK (1910, 2), <i>Weitere Untersuchungen über die Verwendbarkeit des Seidenpeptons zum Nachweis peptolytischer Fermente</i>	52
Zeit. physiol. Chem., 68, 312-16.	
ABDERHALDEN, E., and E. WERTHEIMER (1922), <i>Beitrag zur Kenntnis der sogenannten Antifermente</i>	157
Fermentforsch., 6, 286-301.	
ABEL, E. (1907, 1), <i>Ueber Zwischenreaktionskatalyse</i>	7, 69
Zeit. f. Elektrochem., 13, 555-58.	
ABEL, E. (1907, 2), <i>Kinetik im Katalyse der Wasserstoff-superoxyd-Thiosulphat Reaktion</i>	7, 69
Sitz. Ber. K. K. Akad. Wien. Math. Wiss. Kl., 116, 1145.	
ABEL, E. (1912), <i>Über katalytische Reaktionsauslese</i>	7, 13
Zeit. f. Elektrochem., 18, 705-8.	
AGGIAZZOTTI, A. (1907), <i>Osservazioni ultramicroscopiche sui processi fermentativi</i>	16, 131
Zeit. f. Allgem. Physiol., 7, 62-85.	
ALEXANDER, JER. (1910), <i>Some Colloid-chemical Aspects of Digestion, with Ultramicroscopic Observations</i>	131
Amer. Chem. J., 32, 680-87.	
AMBERSON, WM. R. (1922), <i>Kinetics of the Bioluminescent Reaction in Cypridina, II.</i>	1
J. Gen. Physiol., 4, 535-58.	
ARMSTRONG, E. F., <i>Studies on Enzyme-Action:—</i>	
(1904, 1), <i>II. The Rate of the Change Conditioned by Sacroclastic Enzymes and its Bearing on the Law of Mass-Action</i>	84, 90
Proc. Roy. Soc., 73, 500-16.	
(1904, 2), <i>III. The Influence of the Products of Change on the Rate of Change Conditioned by Sacroclastic Enzymes</i>	91
Proc. Roy. Soc., 73, 516-26.	

	Page of Text where reference is made.
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(1904, 3), <i>IV. The Sacroclastic Action of Acids as Contrasted with that of Enzymes</i>	1
Proc. Roy. Soc., 73, 526-37.	
(1905), <i>VII. The Synthetic Action of Acids Contrasted with that of Enzymes. Synthesis of Maltose and Isomaltose</i>	61, 62
Proc. Roy. Soc., 76, B, 592-99.	
ARMSTRONG, E. F. (1912), <i>The Simple Carbohydrates and the Glucosides</i> . 2nd ed. Longmans, London	60, 63, 64
ARMSTRONG, E. F. (1913), <i>Enzymes</i>	12
Chemical World, p. 117.	
ARMSTRONG, E. F. and H. E. (1913), <i>The Nature of Enzymes and of their Action as Hydrolytic Agents</i>	123
Proc. Roy. Soc., 86, B, 561-86.	
ARMSTRONG, E. F., and T. P. HILDITCH (1920), <i>A Study of Catalytic Actions at Solid Surfaces</i>	117, 150
Proc. R. S., 26, A.	
<i>I. Hydrogenation of Unsaturated Fats in the Liquid State in the Presence of Metallic Nickel</i> , pp. 137-46.	
<i>II. The Transference of Hydrogen from Saturated to Unsaturated Organic Compounds in the Liquid State in the Presence of Metallic Nickel</i> , pp. 322-29.	
ARMSTRONG, H. E. (1885), <i>Presidential Address to Chemical Section</i>	5
British Association Reports, p. 962.	
ARMSTRONG, H. E. (1886), <i>Electrolytic Conduction in Relation to Molecular Composition, Valency, etc.</i>	5
Proc. Roy. Soc., 40, 289.	
ARMSTRONG, H. E. (1890), <i>The Terminology of Hydrolysis, Especially as Affected by Ferments</i>	14
Trans. Chem. Soc., 81, 528-31.	
ARMSTRONG, H. E. and E. F. (1907), <i>The Nature of Enzymes</i>	143
Proc. Roy. Soc., 79, B, 365	
ARMSTRONG, H. E. and E. F., and E. HORTON (1908), <i>Studies on Enzyme Action. XII. Emulsin</i>	172
Proc. Roy. Soc., 80, B, 321-31.	
ARMSTRONG, H. E. and E. F., and E. HORTON (1912), <i>The Enzymes of Emulsin. (1) Prunase the Correlate of Prunasin</i>	146
Proc. Roy. Soc., 85, B, 359-62.	
ARMSTRONG, H. E. and E. F., and E. HORTON (1913), <i>Variation in Lotus corniculatus and Trifolium repens (cyanophoric plants)</i>	143
Proc. Roy. Soc., 86, B, 262-69.	
ARMSTRONG, H. E., M. S. BENJAMIN, and E. HORTON (1913), <i>Urease a Selective Enzyme. II. Observations on Accelerative and Inhibitive Agents</i>	123
Proc. Roy. Soc., 86, B, 328-43.	
ARMSTRONG, H. E., and W. H. GLOVER (1908), <i>The Hydrolysis of Raffinose</i>	172
Proc. Roy. Soc., 80, B, 312-21.	
ARMSTRONG, H. E., and H. W. GOSNEY (1914), <i>Studies in Enzyme Action. XXII. Lipase. IV. The Correlation of Synthetic and Hydrolytic Activity</i>	60
Proc. Roy. Soc., 88, B, 176-89.	
ARMSTRONG, H. E., and E. HORTON (1910), <i>Enzymes of the Emulsin type</i>	77, 146
Proc. Roy. Soc., 82, B, 349-67.	
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ARTHUS, M. (1896), <i>Nature des Enzymes</i> . Thèse. Paris, Henri Jouve	39
AYRTON, BARBARA (1909), <i>The Activation of Pancreatic Juice</i>	159
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J. Physic. Chem., 21 and 22.	
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II. <i>Fractional Combustion</i> , <i>ibid.</i> , 644-75.	
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IV. <i>False Equilibria</i> , 22, 22-43.	
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Arch. d. Sciences Biologiques, 11, 261-96. Supplement, Pavloff Jubilee Volume.	
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Biochem. J., 1, 175-232.	
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J. Physiol., 36, 221-52.	
BAYLISS, W. M. (1908), <i>Ueber die Adsorption und ihre Beziehung zur Enzymwirkung</i>	119
Kolloid-Zeitschr., 8, 224-26.	
BAYLISS, W. M. (1909), <i>The Osmotic Pressure of Congo-red and of some other Dyes</i>	33
Proc. Roy. Soc., 81, B, 269-86.	
BAYLISS, W. M. (1911, 2), <i>On Adsorption as Preliminary to Chemical Reaction</i>	119
Proc. Roy. Soc. 84, B, 81-98.	
BAYLISS, W. M. (1912), <i>II. Synthetic Properties of Antiemulsin</i>	67
J. Physiol., 43, 455-66.	
BAYLISS, W. M. (1913), <i>III. The Synthetic Action of Enzymes</i>	64, 66, 73, 96
J. Physiol., 46, 236-66.	
BAYLISS, W. M. (1915), <i>The Action of Insoluble Enzymes</i>	128
J. Physiol., 80, 85-94.	
BAYLISS, W. M. (1918), <i>Enzymes and Surface Action</i>	129
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J. Physiol., 30, 61-83.	
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J. Physiol., 32, 189-36.	

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BOURQUELOT, EM., et H. HÉRISSEY (1902), <i>Action des ferments solubles et de la levure haute sur le gentiobiose</i> <i>Compt. rend.</i> , 133 , 399.	172
BRADLEY, H. C. (1910), <i>Some Lipase Reactions</i> <i>J. Biol. Chem.</i> , 8 , 251-64.	71
BRADLEY, H. C. (1913, 1), <i>The Problem of Enzyme Synthesis. I. Lipase and Fat of Animal Tissues</i> <i>J. Biol. Chem.</i> , 13 , 407-13.	58

LIST OF LITERATURE REFERRED TO 181

	Page of Text where reference is made.
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J. Biol. Chem., 13 , 419-23.	
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J. Biol. Chem., 13 , 425-29.	
BREDIG, G., und K. FAJANS (1893), <i>Zur Stereochemie der Katalyse</i>	88
Ber. d. deutsch. chem. Ges., 41 , 752-63.	
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Biochem. Zeits., 40 , 7-23.	
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ROSENTHAL, E. (1910), <i>Ueber die antiproteolytische Wirkung des Blutserums</i>	156
Fol. serolog., 6, 285-300.	
ROSENTHALER, L. (1908), <i>Durch Enzyme bewirkte asymmetrischen Synthesen</i>	66, 77
Biochem. Zeits., 14, 238-53.	
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SCHMIDT-NIELSEN, S. und S. (1909), <i>Zur Kenntnis der "Schüttelinaktivierung" des Labs</i>	28
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Pogg. Ann., 114, 275-80.	
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Proc. Roy. Soc., 82, B, 226-32.	
SCHÜTZ, E. (1885), <i>Eine Methode zur Bestimmung der relativen Pepsinmenge</i>	110
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Biochem. Zeits., 22, 33-44.	
SHACKELL, L. F. (1923), <i>Dye-Protein Aggregates</i>	82
Proc. Amer. Soc. Biol. Chem. in J. Biol. Chem., 85, xxxiii-iv.	
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SJÖQVIST, J. (1895), <i>Physiologisch-chemische Beobachtungen ueber Salzsäure</i>	51
Skand. Arch. Physiol., 3, 277-375.	
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Biochem. J., 7, 197-203.	
SLYKE, DONALD D. VAN, and GLENN E. CULLEN (1914), <i>The Mode of Action of Urease and of Enzymes in General</i>	102
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SØRENSEN, S. P. L. (1907), <i>Études enzymatiques</i>	48
C. R. Lab. de Carlsberg, 7, 1.	
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STARCKENSTEIN, EMIL (1910, 1), <i>Eigenschaften und Wirkungsweise des diastatischen Fermentes der Warmblüter</i>	114, 153
Biochem. Zeits., 24, 191-209.	
STARCKENSTEIN, EMIL (1910, 2), <i>Ueber Fermentwirkung und deren Beeinflussung durch Neutralsalze</i>	114, 124
Biochem. Zeits., 24, 210-18.	

	Page of Text where reference is made.
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TAKEUCHI, T. (1909), <i>Urease in Higher Plants</i>	173
J. Coll. Agr. Tokyo, 1, 1-14.	
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Zeit. f. physik. Chem., 3, 25-37.	
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Zeit. f. physiol. Chem., 16, 271-328.	
TAMMANN, G. (1895), <i>Zur Wirkung ungeformten Fermente</i>	70
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J. Coll. Engineering, Tokyo, 5, 25-42.	
TANAKA, YOSHIO (1912), <i>The Preparation of Lipase-powder acting in Neutral Medium</i>	162
J. Coll. Engineering, Tokyo, 5, 125-36.	
TAYLOR, A. E. (1907), <i>On the Synthesis of Protein through the Action of Trypsin</i>	75
J. Biol. Chem., 3, 87-94.	
TAYLOR, A. E. (1910), <i>On the Conception and Definition of the Term Catalysor</i>	13
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C.R. Soc. de Biol., 68, 404-6.	
TERRONNE, E. F. (1910, 2), <i>Action des sels biliaires sur la lipase pancréatique, 1^e note</i>	152
C.R. Soc. de Biol., 68, 439-41.	
TERRONNE, E. F. (1910, 3), <i>Action des sels biliaires sur la lipase pancréatique, 2^e note</i>	148
C.R. Soc. de Biol., 68, 518-20.	
TERRONNE, E. F. (1910, 4), <i>Action des sels biliaires sur la lipase pancréatique, 4^e note</i>	151
C.R. Soc. de Biol., 68, 754.	
TERRONNE, E. F. (1910, 5), <i>Zur Kenntnis der Fettspaltung durch Pankreassaft. I. and II.</i>	134
Biochem. Zeits., 23, 404-62.	
THAYSEN, A. C. (1915), <i>Researches on the Inhibition Produced by Certain Sera on the Coagulating Power of Rennet</i>	154
Biochem. J., 9, 110-31.	
THIELE, F. H. (1913), <i>On the Lipolytic Action of the Tissues</i>	59
Biochem. J., 7, 287-96.	
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TRAVERS, M. W. (1907), <i>The Law of Distribution in the Case in which one of the Phases possesses Mechanical Rigidity: Adsorption and Occlusion</i>	120
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	Page of Text where reference is made.
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WEINLAND, E. (1909), <i>Ueber die Zersetzung von Fett durch die Calliphoralarven</i>	59
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197

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WILLSTÄTTER, RICH., u. A. POLLINGER (1923), <i>Über Peroxidase</i>	38, 165
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Biochem. J., 12, 499-515.	
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Arch. internat. de Physiol., 5, 245-56.	

INDEX.

- ACTIVE oxygen**, 165.
Activity of enzyme, 97.
Adsorption, 26, 121.
 — compounds, 30, 119.
 — compounds of enzymes, 123.
 — of all constituents of system, 136.
 — of enzymes, 123.
 — — use of, in purification, 46,
Alcoholic fermentation, 171.
Alcohols, action of, on enzymes, 129.
Anaerobic oxidation, 168.
Anti-body, nature of, 58.
Anti-emulsin, 67, 154.
Anti-enzymes, 153.
Antiseptics, 41, 114.
Anti-trypsin, 155.
Arginase, 173.
Artificial laccase, 164.
Asymmetric synthesis, 77, 88.
Autocatalysis, 98, 135.
- BALANCED biochemical reactions**, 54.
Benzaldehyde-cyanhydrin, 66, 77, 138.
Bertrand on nature of enzymes, 38.
Biological method of purifying, 47.
Brownian movement, 33.
- CARBON assimilation**, 104.
Catalase, 163.
Catalysis, 1, 2.
Catalysts not mere properties, 10.
Change in state of catalysts, 7.
Chemical properties of surfaces, 35, 121.
 — relationship of enzyme and substrate, 92, 144.
Chlorophyll function, 169.
Coagulation of blood, 170.
Co-enzyme, 114, 150.
 — of amylase, 153.
 — of lipase, 150.
 — of zymase, 152.
Colloidal complexes, 30, 119.
 — state, 24.
 — substrates, 126.
Combination of enzyme with products, 92.
 — — — with substrate, 86.
Compatibility, 146.
Complex systems, 34.
Compressive forces in surfaces, 118.
Concentration of enzyme, 89, 110, 126.
 — of substrate, 108, 124.
Contact catalysis, 116.
Coupled reactions, 168.
Criteria of catalysts, 6, 15.
- DIASTASE**, II.
Difficulty of reactions, 89, 148.
Diffusion in heterogeneous systems, 100, 116.
Dilatometer measurements, 50.
Dilution and activity of invertase, 126.
Disappearance of enzyme, 85.
Dispersion of enzymes, 27, 130.
Dispossession from surface, 128.
Divergence from uni-molecular law, 84.
- EFFECT of products**, 86.
Electric charge of colloids, 28.
 — — of enzymes, 29.
Electrical adsorption, 133.
 — conductivity method, 51, 53.
Electrolytes, action on enzymes, 113, 132.
 — and colloids, 34.
Enterokinase, 20, 159, 160.
Enzyme action on reversible reactions, 21.
Enzyme, definition of, 12.
 — history of name, 11.
Enzymes act when insoluble, 127.
 — are colloids, 24.
 — as bye-products, 42, 145.
 — compound nature of, 38, 39, 132.
Enzymes not constituents of equilibrium, 69.
 — not mere properties, 39.
 — not proteins, 36, 67.
Equilibrium a true one, 74.
 — and surface condensation, 137.
 — in diastase system, 108.
 — in lipase system, 94, 138.
 — with enzymes and with acid, 137.
Estimation of strength, 52.
Evaporation of solutions of enzymes, 148.
Exponential law of adsorption, 31.
 — — of enzyme concentration, 112.
- FALSE equilibrium**, 69, 137.
Faraday's platinum experiments, 10.
Fat, synthesis of, 58.
Ferments, 11.
Final result, 18.
Freezing-point measurements, 50.
- GENERAL equation for enzymes**, 101.
 — theory, 122.
Gentianose, hydrolysis of, 172.
Gibbs' theorem, 119.
Glucose, equilibrium of, 60.
Glucosides of primary alcohols, 64.
 — stereochemistry of, 60.
Glycogen, storage of, 56, 65.
Glutathione, 169.
Growth, law of, 114.
- HEAT**, effect of, 23.
 — precipitation, 107.
Helmholtz double layer, 33.
Heterogeneous catalysis, 116.
Hydrogen-ion effect, 97, 99, 132.
Hysteresis, 28.
- IMBIBITION**, 132, 136.
Importance of small degree of synthesis, 56.
Incompleteness of change, 16, 69, 70.
Indophenol oxidase, 166.
Initiation of reaction, 4, 5, 15.
Insoluble enzymes active, 127.
Instability of enzymes, 85.
Instantaneous and slow reactions, 2.
Intensity factor, 94.
Intermediate compounds, 8, 86, 117.

- Intracellular enzymes, 43.
 Inversion by acid, 83.
 Inversion by enzymes, 84.
 Invertase, synthesis by, 55.
 Isoelectric constant, 29, 30.
- LACTASE compared with acid, 1.
 — synthesis by, 62.
 Lactose formation, 58, 65.
 Law of velocities, 81.
 Lipase a uniform enzyme, 147.
 — content of tissues, 58.
 — synthesis by, 57.
 Lock and key simile, 87, 140, 143.
 Logarithmic curve, 81.
 Luciferase, 1, 82.
 Luciferin, 1, 82.
- MALTASE, synthesis by, 61.
 Mass-action, 79.
 — and enzymes, 82.
 Mathematics in biology, 79.
 Mechanical schema, 3.
 Methods of stopping action, 52.
 Mett's tubes, 50, 101.
 Minuteness of quantity, 21.
- NEW enzymes, 143.
 — production of enzymes, 41.
- OPTICAL activity as method, 48.
 — — of catalysts, 88.
 — — of enzymes, 87.
 — factor, 49.
 — isomers both attacked, 144, 145.
 Optimal hydrogen-ion concentration, 113, 114.
 Optimum temperature, 103.
 Orientation of molecules on surfaces, 3, 121.
 Osmotic pressure of colloids, 33.
 Oxidase, 164.
 Oxidation, 163, 165.
- PARALYSIS of enzymes, 72.
 Paranuclein, synthesis of, 73.
 Pepsinogen, 160.
 Peptone Roche, use of, 52.
 Peroxidase, 163 sqq.
 Plasteins, 75.
 Precipitation of enzymes, 47.
 Products, effect of, 86.
 Promoters, 150.
 Protection from aggregation, 33, 165.
 — from destruction, 86, 91.
 — from heat, 130.
 — of mucous membranes, 158.
 Protective enzymes, 41.
 Proteoclastic systems, 173.
 Purification of enzymes, 35, 45.
- RACEMIZATION by enzymes, 147.
 Raffinose, hydrolysis of, 172.
 Reactions either chemical or physical, 35.
 — in living organisms, 1.
 Reducase, 167.
 Relative adsorption in complex mixtures, 137, 139.
 Rennet and pepsin, 147.
 Retardation by fructose, 91.
- Reversibility as retarding factor, 91.
 — of enzymes, 54.
 — of reactions in general, 54.
 Reversible reactions, catalysis of, 6.
- SCHARDINGER'S enzyme, 167.
 Schutz-Borissow law, 110.
 Selective inorganic catalysts, 12.
 Small degree of synthesis important, 56.
 Solid solution, 120.
 Solubilities of enzymes, 131.
 Square root law, 110.
 Specific activators, 114.
 — adsorption, 140.
 Specificity, 89.
 — of enzymes, 142.
 Starch formation by amylase, 65.
 — hydrolysis of, 172.
 — in germination, equilibrium in, 56.
 Stopping action, 52.
 Synthesis by amino-acids, 76.
 — by enzymes, 8, 21, 22.
 — by invertase, 56.
 — by lactase, 62.
 — by lipase, 57.
 — by maltase, 61.
 — of a protamine, 75.
 — of cane-sugar, 74.
 — of glucosides, 60, 64.
 — of optically active substances, 145.
 — of proteins, 74.
 Synthetic enzymes, 65.
 Surface condensation, 9.
 — — and equilibrium, 137.
 — — theory, 117, 118.
 — development in colloids, 25, 26.
 — energy and equilibrium, 7, 69, 138.
 — tension, 26.
- TEMPERATURE, coefficient of dispossession, 130.
 — effect, 135.
 — effect of, 52, 72, 103.
 Terminology of enzymes, 14.
 Thermo-neutral reactions, 138.
 Time factor, 104.
 Tissue-juice by disintegration of cells, 44.
 Trigger action, 3, 18.
 Trypsinogen, 159.
- ULTRA-MICROSCOPE, 25.
 Ultra-microscopic observations, 131.
 Uni-molecular reaction, 80.
- VARIETY of products, 16.
 Velocity of reaction, 79.
 — of enzyme reactions, 101.
 Viscosity as method, 51.
 — effect on rate of reaction, 109.
- WATER, function of adsorbed, 138, 139.
 — in balanced reactions, 55.
 — in enzyme phase, 55.
- ZYMOGEN of lipase, 162.
 Zymogens, 159.
 Zymoids, 149.