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Vol. 30. *Chemical and Biological Aspects of Pyridoxal Catalysis*—E. E. SNELL, P. M. FASELLA, A. BRAUNSTEIN and A. ROSSI FANELLI (Editors)

CHEMICAL AND BIOLOGICAL ASPECTS OF PYRIDOXAL CATALYSIS

Proceedings of a symposium of the International Union of Biochemistry, Rome, October 1962

Contributory Support from the Italian National Council of Research and the Accademia Nazionale dei Lincei

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A Pergamon Press Book

THE MACMILLAN COMPANY
NEW YORK
1963

THE MACMILLAN COMPANY
60 Fifth Avenue
New York, 11, N.Y.

This book is distributed by
THE MACMILLAN COMPANY · NEW YORK
pursuant to a special arrangement with
PERGAMON PRESS LIMITED
Oxford, England

Library of Congress Card No. 63-21972

Printed in Great Britain by Bell and Bain, Ltd., Glasgow

PREFATORY NOTE

by E. E. SNELL

PUBLISHED records of scientific symposia lose much of their value if publication is unduly delayed. In the present instance, we have chosen to proceed with publication at the expense of omitting much of the interesting (and sometimes heated) discussion which occurred during the meeting. Unfortunately, requests for a written clarification of questions and answers were frequently not met by the respondents within the " deadline " period set by the Editors; on occasion extensive elaborations of special viewpoints were submitted which it seemed unfair to present without affording equal opportunity to others whose views were questioned. In general, such comments have been omitted; with minor exceptions the published discussion is an incomplete record of that actually offered during the meeting.

Unfortunately, a manuscript of the interesting paper presented by Dr. Gunsalus (B_6-linked Enzymes in Serine and Glycine Transformations) was not submitted. Dr. Velick's valuable contribution (A Kinetic and Equilibrium Analysis of the Glutamate–Oxalacetate Transaminase Mechanism) has already appeared in full elsewhere (S. F. Velick and J. Vavra; *J. Biol. Chem.* **237**, 2109 (1962)).

The Editors take this occasion to thank the participants once more for their contributions to a most interesting and successful meeting.

OPENING ADDRESS

by A. Rossi Fanelli

It is an honour and a privilege for me to welcome you to the Accademia dei Lincei and to the opening session of our Symposium.

I wish, first of all, to express to the Chief of the Italian State our gratitude for having honoured us with his presence. His participation in a strictly scientific gathering such as ours is a source of real joy to me, because it is a further proof of his vast and deep interest in science. Scientists feel now more than before the necessity of leaving, at times, the seclusion of their laboratories to meet the people to whom their research is dedicated and to seek the understanding and support of the representatives of the people. I heartily thank, therefore, the representatives of the Italian Senate, Government, Supreme Court and the other authorities who accepted our invitation.

Most of all I am grateful to my fellow scientists, who suffered the discomforts of long or very long journeys to bring us the precious contributions of their knowledge and experience.

We are gathered here to begin a week's work on one of the most exciting and promising problems of modern enzymology: pyridoxal catalysis. The importance of this vitamin as the key compound in some of the most important reactions of protein metabolism is now universally acknowledged. In recent years, another even more interesting aspect of pyridoxal biochemistry has been investigated: the detailed mechanisms by which pyridoxal catalysis occurs. These researches have opened new perspectives for a more general understanding of enzyme action, a subject of fundamental importance, both theoretical and practical, for all biological sciences.

Later Professor E. E. Snell, to whom we owe so much of what we know about vitamin B_6, will give you a synoptic view of the development of studies in this field.

Then Professor Braunstein, the discoverer of biological transamination, will outline the present status and outlook for research on pyridoxal catalysis.

The idea of organizing this Symposium originated last year in Moscow, where we had gathered for the Fifth International Congress of Biochemistry. Recent work on pyridoxal catalysis impressed Professors Braunstein, Snell and myself as being so outstanding in quality and quantity, as to make a high-level meeting dedicated to this subject not only useful but necessary.

Thus, a proposal was made to gather the " wise men of pyridoxal " halfway between Moscow and Berkeley for a thorough discussion of the biological and chemical aspects of B_6 catalysis. Rome was suggested as the meeting place because of its geographical location, the traditional majesty

of the city and our interest in this field. Though well aware of the difficulties and responsibilities involved, we accepted the proposal, persuaded as we were of its soundness and confident of the support afforded by Professors Braunstein's and Snell's authority and experience.

The International Union of Biochemistry, ready as usual to meet the problems and to facilitate the enterprises of biochemists, willingly accepted the sponsorship of the Symposium. Dr. Stotz, will welcome you here on behalf of the Union.

I personally wish to express to Dr. Stotz our gratitude for the moral support and financial help the Union gave us.

The Italian National Research Council (CNR) contributed equal moral and economic aid to our endeavour and also deserves our gratitude. Professor Califano is here to represent Professor Polvani and to greet you on behalf of the CNR.

The invitations to participate in the Symposium were warmly accepted by most of the researchers in the field.

You may have noticed that the emblem of our Symposium carries the carved image of a Lynx, which for four centuries has been the symbol of the Accademia dei Lincei. This symbol was adopted by our Symposium in gratitude for our host, the Accademia, as a souvenir representing its traditions in the history of science, and also as a source of inspiration for all of us during the works of the Symposium. You came to a city that is almost three thousand years old and you must grant something to the Roman tendency to look at current events in the perspectives of centuries. The Accademia dei Lincei was founded in 1603 by a group of young people, of different nationalities, united by the desire to cultivate science according to the experimental method that had been recently proposed and applied for the first time by Galileo Galilei. The Lynx was chosen as the symbol of the Academy because of its sharpsightedness, a quality that well represents what the mental attitude of a researcher should be.

Since its foundation, it has been a specific purpose of the Academy to encourage the synthesis between experimental approaches and theoretical deductions for a common, deeper interpretation of truth. I am certain that this principle of mutual understanding and collaboration will inspire all participants to this Symposium, despite the difference in backgrounds and interests.

The ideal of international collaboration, that has also been pursued in this Academy since its foundation, derives further strength from your presence here.

To all of you, I express my thanks for what you will teach us in these days, and to all of you I wish a week of fruitful and pleasant work.

OPENING REMARKS

by E. H. STOTZ

Treasurer of the International Union of Biochemistry

IT IS a pleasure indeed to attend this significant event in the scientific program of the International Union of Biochemistry and of the other sponsoring bodies; and on behalf of the Union to express its gratitude to Professors A. E. Braunstein, E. E. Snell and A. Rossi Fanelli for their parts in organizing the program. It is fitting that this International Symposium on the " Biological and Chemical Aspects of Pyridoxal Catalysis " be held here in Rome in view of the great contributions that Italian biochemists are making in this field and in Biochemistry generally.

It occurs to me that only a limited number of those present may know what the International Union of Biochemistry is, and what its sponsorship of a symposium means. The simplest objective of the International Union of Biochemistry (IUB) is to promote co-operation and exchange of information at the international level. Prior to 1955 there was an informal International Committee of Biochemistry, which organized two International Congresses of Biochemistry. In January 1955 the IUB was formally constituted, and later in the same year was admitted to the International Council of Scientific Unions (ICSU). The latter organization has a number of member Unions, of which IUB is one of the newest. ICSU receives a very modest annual subvention from UNESCO, which it divides among its member Unions. In addition to these funds, IUB receives annual subscriptions from its member countries, of which there are presently twenty-six. Italy is of course a member of IUB, has a National Committee of Biochemistry, and our host, Professor Rossi Fanelli, has been the representative of Italy in the General Assembly and Council of IUB.

Since becoming a Union in 1955, IUB has sponsored three International Congresses of Biochemistry, Brussels in 1955, Vienna in 1958, and Moscow in 1961. The 1964 Congress will be in New York, and the 1967 Congress probably in Tokyo. IUB maintains close relations with the International Union of Pure and Applied Chemistry, the International Union of Physiological Sciences, and the International Union of Biological Sciences to promote co-operation and avoid duplication of effort. IUB is itself a member group in the Council of International Organizations of Medical Sciences (CIOMS), which is part of WHO.

IUB has had a Commission of Enzymes, which has made a first report on enzyme nomenclature and classification, and after collection of comments a final definitive report will be made which it is hoped will greatly clarify understanding and nomenclature throughout the world. A Commission of Editors of Biochemical Journals has also been established, which will deal with recommendations of various nomenclature groups in all phases of biochemistry. Acceptance of a recommendation by this group may be translated into journal use with minimum delay.

Finally, since the large Congress has certain limitations for the intimate exchange of information, IUB has also sponsored symposia. Sponsorship means that the Union accepts the proposal made by an organizing group of biochemists, and may agree to support it financially. Even though such support is severely limited, sponsorship is frequently the condition which permits various agencies in the individual countries to support the travel of their national participants. IUB has thus far sponsored symposia on Enzyme Chemistry in Tokyo, on the Origin of Life in Moscow, on Hematin Enzymes in Canberra, and a joint Symposium with the Union of Biological Sciences on " Biological Structure and Function " in Stockholm.

Now we are gathered for the International Symposium on Biological and Chemical Aspects of Pyridoxal Catalysis. IUB extends its thanks to the organizers and participants in this Symposium and wishes all good success for a profitable exchange of scientific information among biochemists of several nations.

WELCOMING ADDRESS

by LUIGI CALIFANO

Representative of the Italian National Research Council (CNR)

IT IS a pleasure to extend to you, on behalf of Professor Giovanni Polvani, President of the CNR, a formal welcome to this meeting and to express our gratitude for having honoured us with your presence.

The Italian National Research Council has always encouraged biochemical studies; in recent years new research centers have been created in order to keep pace with the rapid progress of this Science; the center for Enzymology of Rome, which is responsible for the local organization of this Symposium is one of them. Closer contacts between researchers interested in related fields have been promoted by developing inter-departmental programs.

Persuaded as we are of the necessity of direct exchange of ideas and informations among scientists of all nations, we promptly accepted to co-sponsor this Symposium which promises to mark a significant point in our knowledge of a very important field of biochemistry, and to present detailed explanations of the physicochemical mechanisms of various fundamental biological processes.

On behalf of the CNR I wish you all a week of constructive work.