SOVIET VIEWS ON VITAMIN B₁₂

By PROF. J. BIELY

Department of Poultry Science, University of British Columbia, Vancouver, Canada

IN the summer of 1961 I attended the fifth International Congress of Biochemistry held in Moscow, U.S.S.R. As a result I was able to establish friendly relations with a number of prominent Russian investigators in the field of vitaminology from whom I have since received a number of very interesting monographs. These cover research work of which I had no previous knowledge, although they contain a wealth of original information. They do not contain summaries in English, French or German, languages with which English-speaking people are familiar, which is most regrettable because most of the published papers deserve much wider recognition than they now receive, since they are available only in the Russian language.

As one means of overcoming the difficulty I suggest that some of the more significant papers be translated into English and published. This would make available to English-speaking people some knowledge of the vast research work being carried on in the U.S.S.R.

I recently received a monograph entitled *Vitamin Resources and their Uses* published by the Institute of Biochemistry which was named after Prof. A. N. Bach*. This is the fifth volume in a series. It contains 311 pages and deals with 28 different topics. The introduction is written by Dr. V. N. Bukin and Mme. L. Y. Areshkina. I think the best way of reviewing the contents of this monograph is by way of a translation (more or less free) of this introduction, which gives a general idea of the subject-matter covered. The majority of the papers are of a highly technical nature, and it is very gratifying indeed to see the number of references made to foreign publications, particularly those in English. There are, of course, many references to Russian authors.

"The high biological activity of vitamin B₁₂ excited unusual interest, initiating an enormous flood of publications dedicated to the study of the various aspects of the problem.

"This type of work began in the U.S.S.R. in 1952 when in the Vitamin Laboratory of the Institute of Biochemistry, named after A. N. Bach, the first crystals of vitamin B₁₂ were received and turned over to sixteen clinics for experimentation.

"In the course of these experiments, significant results were obtained in the clinic of the Central Institute of Haematology and Blood Transfusion, and other clinics treating haematopoietic disorders. At the same time it was established that, over and above participation in haematopoiesis, vitamin B₁₂ also plays an important part in the functions of the liver and nervous system.

"Since then a series of biochemical, technological and clinical researches were twice discussed at symposia on vitamin B₁₂ in 1958 and 1960. Simultaneously with clinical experiments with the crystal-

line preparation, tests were also made of less-refined preparations to be used with livestock, produced by the same laboratory and the All-United Vitamin Institute. The combined results of these tests are reported in two bulletins.

"The results of all this research were published in a journal *Vitamin B₁₂ and its Clinical Uses*, (Medgiz, 1956), which also included tests in the field of biosynthesis and technology in the production of vitamin B₁₂.

"The contents of this monograph therefore express in various ways the different trends of the experiments. There is a definite reason for this kind of grouping of related works as the mutual familiarization of specialists of different branches of knowledge, working on one and the same subject, is a source of incentive to new methods and expressions of new areas of study and use of the vitamin. The articles in the monograph are grouped in the following basic divisions: biochemistry of vitamin B₁₂; its biosynthesis and technology of production; chemical, microbiological and biological methods of determination; the use of vitamin B₁₂ in clinics; its use in livestock breeding. In each of these divisions new experimental results appear as well as conclusions and recommendations of a scientific or practical nature, and methods of testing are given in such detail that these could be reproduced in other laboratories.

"A large part of the monograph is set aside for the reporting of work on the biosynthesis of vitamin B₁₂ and this is very gratifying. Over and above the scientific interest in this work, this has an independent practical meaning since on an adequate synthesis depends the health and potential productivity of livestock. Unfortunately, one cannot say the same of research dedicated to the study of the biochemical functions of vitamin B₁₂. These works are no less important, but they are few; it is essential to develop research in this direction.

"A whole series of papers in the monograph is dedicated to research in the uses of vitamin B₁₂ for the clinical treatment of serious illnesses.

"In these articles there appears an exceedingly important and new proof, obtained in the course of experimentation on animals (S. V. Andreyev) and in the clinic (a series of authors), of the outstanding role of vitamin B₁₂ in the treatment of severe traumas of nervous, muscular, vascular and bone tissues. This material could be the starting point for extremely important biochemical research of normal and traumatized tissue.

"Finally, there are two articles showing the vast effect of the use of vitamin B₁₂ on livestock. One especially interesting fact determined in the course of this work is the interrelation and synergism of the growth-stimulating action of vitamin B₁₂ and antibiotics. Quantitative interrelation in this connexion has not as yet been studied although it would appear to be most important from a practical stand-

* *Vitamin Resources and Their Uses*—Vitamin B₁₂—its biosynthesis, functions and uses. Foreword by Dr. V. N. Bukin and Mme. L. Y. Areshkina. (Published by the Bach Institute of Biochemistry, Moscow, U.S.S.R.) 1.25 dollars.

point and also in explaining the mechanics of the growth-stimulating action of antibiotics.

"We hope that the publication of this monograph will assist in developing further theoretical research and a wider application of vitamin B₁₂ in clinical work and on livestock with the view that all the valuable qualities of this vitamin may be most fully utilized for the protection of animal health and ensuing material benefits."

In view of the present interest in vitamin B₁₂ I think it would be well worth while if some agency could undertake to provide an English translation of this monograph and also perhaps of the four which preceded it.

I thank Mrs. Pauline Renacre, 205 East 29th Ave., North Vancouver, for her assistance with the translation, and Mrs. A. McCullough, secretary in the Faculty of Agriculture, for help in editing the manuscript.

GLOBAL FALL-OUT IN AUSTRALIA DURING 1960-61

DURING the years 1960 and 1961, continuous monthly sampling of fall-out over Australia for gross radioactivity was maintained by the Atomic Weapons Tests Safety Committee at eight stations: Perth, Adelaide, Melbourne, Hobart, Sydney, Brisbane, Townsville and Darwin. The Committee's network of 24 stations taking daily samples was closed down in April 1960, when no active samples had been detected for more than a year. In the past, this monitoring programme, and, especially, the daily sampling, provided information on tropospheric and early stratospheric fall-out over Australia from nuclear weapon tests held overseas. Accordingly, when the Soviet Union resumed testing of high-yield weapons in the atmosphere in September 1961, the daily sampling was recommenced using the 24-station network to give representative measurements for the regions inhabited by the majority of the Australian population.

The observations of gross radioactivity in fall-out are complementary to data obtained by the Committee in its extensive and continuous survey of strontium-90 in the Australian environment. Results from this survey to the end of 1960 have already been published in detail. A report by Drs. J. R. Blake, L. J. Dwyer, J. R. Moroney, D. J. Stevens and Prof. E. W. Titterton* presents the results of total β -activity measurements on the monthly samples taken from January 1960 until December 1961, and on the daily samples taken from September 15 until December 31, 1961, following the resumption of weapon testing by the U.S.S.R.

* *Austral. J. Sci.*, 24, No. 12 (June 1962).

During the two years for which results are presented, the U.S.S.R. tested about 50 weapons in the atmosphere from September to November 1961; France tested three weapons in the atmosphere over the Sahara Desert in February, April and December 1960; late in September 1961, the United States commenced a new programme of underground testing at the Nevada test site.

The major weapon tests by the U.S.S.R. were carried out in the vicinity of Novaya Zemlya in the Arctic; the United States Atomic Energy Commission has estimated the total explosive yield for the series to be about 120 megatons and the fission yield at about 25 megatons. This corresponds to an injection of radioactivity into the atmosphere of the northern hemisphere in the order of twice that which resulted from the weapon tests conducted by the U.S.S.R. in the Arctic in October 1958; those tests produced, during 1959, marked increases in radioactivity in the biosphere of the northern, but not of the southern, hemisphere. France tested only low-yield nuclear weapons of estimated total yield considerably less than 1 megaton. No global fall-out has arisen from the underground weapon tests being carried out by the United States.

Results show that the level of total β -activity in fall-out over Australia continued to decrease during the period 1960-61. The data give no indication of the arrival of debris from the French tests during this period or the major U.S.S.R. series of September-November 1961. Some fall-out over Australia of long-lived fission products from these Soviet tests may be expected in the spring of 1962.

NORWAY INSTITUTE OF ATOMIC ENERGY

AN illustrated survey of the work of the Institute for Atomenergi (IFA) at Kjeller and Halden, Norway, during 1961, together with details of the organization and an abstract of the accounts for the budget year 1961, are given in the recent report*. Mr. Gunnar Randers continued as managing director with Mr. O. R. Kåsa as assistant director and project manager of the Halden Project.

The main facility for physics research and isotope production is the 10-year-old 450-kW heavy-water reactor *Jeep* at Kjeller. The reactor, which is operated continuously, except for routine stops for isotope insertion and removal, and the semi-annual inspection

of the fuel element canning, released 130.3 MWD of heat during 1961, bringing the total up to 680.5 MWD since the reactor commenced operation. At the summer inspection the aluminium canning of one fuel element showed several cracks. This was the first time that such damage had been detected. Various improvements in the reactor system and auxiliary equipment were made during the year. In order to compensate for the neutron loss due to the slightly thicker walls of the new reactor tank installed during 1960 and to improve neutron flux conditions, some fuel elements consisting of 1.7 per cent enriched uranium oxide are to be installed and the first of these, installed in November 1961, has already improved the flux and reactivity conditions.

* Institutt for Atomenergi, Kjeller. Survey of Activities, 1961. Pp. 24. (Kjeller: Institutt for Atomenergi, 1962.)