case is exceptional. Doubtless Dr. Kondō would have supplied a synopsis in English, with which language he is familiar, but this seemed unnecessary, partly because his long series of papers in German and English, on which his book is largely based, are at the reviewer's elbow and partly because the faithfully executed illustrations in the work, especially those showing the histological structure of seeds, are eloquent to a specialist in this field without referring to the text. Although the shelf-backs, title pages and main text of the two volumes are entirely in Japanese characters, the names of authors and the Latin names of species throughout the work are in Latin type, as are also the English, German and French references in the bibliography of 1,123 titles and the technical terms in the glossary and index.

Kondō, who studied with Wittmack at the University of Berlin, wrote his earlier papers and some recent ones in German, but during the past few years he has published in English a noteworthy series on methods of storing rice of bumper harvests so as to avert famine during lean years.

Nobbe's and Harz' standard books on seed science —"spermology," the lexicon equivalent for Samenkunde, sounds strange and is here avoided—have long awaited a reviser. Neither has been translated into English and no comprehensive work in our language has yet appeared. Kondō's work stands supreme, and all that is needed to make it available to the greatest numbers is an English translation.

A few years since, the writer of this review was honored by a short visit from Dr. Kondō, who was making a world tour via Siberia, Russia and Germany. While in Berlin, with oriental respect for the aged, his evenings were spent devotedly with his infirm teacher, Wittmack. One is reminded of the great Japanese bacteriologist who annually performed rites for the repose of the soul of his teacher, the immortal Koch, at the Shintoist shrine in his institute.

ANDREW L. WINTON

FOODS IN JAPAN

The Chemical Analysis of Food in Japan. By T. SAIKI, T. HIGUCHI, M. KONDŌ and K. MATSUZAWA. Third enlarged edition, 353 pp. Nankodo and Company, Ltd., Tokyo. 1934.

ON a recent visit to Japan, I had the privilege of renewing my acquaintance with Dr. Tadasu Saiki, an old student of Lafayette B. Mendel's at Yale, who is the director of the Imperial Government Institute for Research in Nutrition in Tokyo. There I learned among other interesting things that this institute has issued recently a third enlarged edition of a monograph which is almost unknown in America, but which should be of very great interest to food chemists and students of nutrition. This book, "The Chemical Analysis of Food in Japan," gives the chemical composition of a very large number of foods used in Japan (edible part, water, total nitrogen, protein, fat, carbohydrate, fiber, ash, water-soluble ash, water-insoluble ash, alkali value, alkalinity due to soda and potash, alkalinity due to lime and magnesia, P_2O_5, CaO, Fe_2O_3, NaCl, number of calories in 100 grams). It also contains tables giving the weight of food corresponding to 100 calories and the amount of water, protein, fat, carbohydrate, fiber and ash in 100 calories. It also gives tables of the calorific ratio of the constituents contained in 100 calories of food. The legends at the beginning of all tabulations are in English as well as in Japanese. The index gives the Japanese names in our alphabet as well as the Chinese characters or *kana*. There are also key tables giving the Japanese name in *kana* and characters as well as in our alphabet; also the corresponding English word, if there is an equivalent, and in the case of animal and vegetable products the Latin scientific name. All figures are of course in Arabic numerals. It is therefore a perfectly simple matter to use this book without any knowledge of Japanese whatever.

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SOCIETIES AND MEETINGS

THE NINTH ANNUAL FIELD CONFERENCE OF THE KANSAS GEOLOGICAL SOCIETY

MEMBERS and guests of the Kansas Geological Society participated recently in the ninth annual field conference, a geological excursion which extended from Iowa City, Iowa, to Duluth, Minnesota, and encompassed about 1,542 miles. The society, organized for purposes of geological research with special application to petroleum geology, inaugurated the field conferences in 1927. Its membership had expressed the desire to study in outcrop the several formations which, in daily routine, were customarily examined in well cuttings. In carrying out this purpose the members have visited and revisited the general peripheral localities of the western interior petroliferous province and the principal areas of local uplift, including the Ozarks, Arbuckle Mountains and the Black Hills. In completing the ninth annual field conference, the society now has added a few links to a chain of field investigation which extends from the general vicinity of Amarillo, Texas, along the foothills of the

Colorado Rockies, through the Black Hills to the Pre-Cambrian regions of southwestern and northeastern Minnesota, and through Wisconsin and northwest Illinois to the Ozarks of southeastern Missouri. The total distance covered in the nine conferences amounts to 9,362 miles, the time spent by the parties in the field has been 61 days, and joint investigations and discussions have been made at 433 "stops."

The ninth field conference, lasting from August 25 to September 1, 1935, was arranged by two committee groups, one representing the society, with its headquarters in Wichita, Kansas, and the other composed of state geologists and their assistants in the several states included in the itinerary of the conference. The Wichita committee was in charge of Anthony Folger, with Harvel E. White as business manager and E. A. Wyman as advance agent. The local committee was directed by Dean G. F. Kay, State University of Iowa, who had charge also of the first field conference of the society in 1927. To A. C. Trowbridge, state geologist of Iowa, was given the active leadership of the conference, a task which has required two years of planning in order to fashion the log of the route followed, the selection of exposures studied and the editing of the guidebook, which became in effect a geological monograph.

Assembled with Trowbridge as associate directors of the conference were the state geologists of Illinois, Minnesota and Wisconsin, M. M. Leighton, W. H. Emmons and E. F. Bean, respectively, and A. C. Tester, assistant state geologist of Iowa. The discussions in the field were given by men who have specialized in the stratigraphy and general geology of the regions visited. In Iowa, G. Marshall Kay, A. C. Tester and M. A. Stainbrook served as lecturers. J. M. Weller presented the stratigraphic and general geology of northwestern Illinois. F. C. Thwaites, Andrew Leith and G. O. Raasch discussed the physiography, structural features and stratigraphy of Wisconsin, and G. M. Schwartz, G. A. Thiel and L. H. Powell lectured for the group while it was in Minnesota. On several occasions A. C. Trowbridge made introductory statements concerning the general bearing of the geological problems presented in the type sections and type localities visited. Josiah Bridge, of the U. S. Geological Survey, presented instances of correlations of units in the northern and southern Mississippi Valley regions. To supplement the discussions made at the stops, the guidebook includes detailed sections and extended reviews of the controversial aspects of certain of the interpretations offered.

The daily study in the field during the conference was further agumented by evening programs. In the first of these programs the group listened with profit to the discussion of the Pleistocene features of the entire area of the conference excursion presented by Dean Kay on August 25. Further comments on the Pleistocene geology were offered at that meeting by Drs. Leighton, Thwaites and Tester. At another evening meeting, in response to the conference invitation, Dr. E. O. Ulrich gave a résumé of his foundational studies in the stratigraphy of the Upper Mississippi Valley. At that meeting E. F. Bean and G. O. Raasch paid fitting tribute to the labors of Ulrich in Wisconsin. On August 29, A. Irving Levorsen, president of the American Association of Petroleum Geologists, submitted "The Oil Migration Problem" and a spirited and interesting discussion followed his address. In the last of the evening meetings, on August 30, G. M. Schwartz, of the University of Minnesota Geology Department, discussed the "Geology of the Minneapolis-St. Paul Metropolitan Area." For this area of 1,000 square miles the studies of Schwartz and his associates were presented in the areal geology map submitted for inspection as well as in the address of the evening. The only non-geological topic of the evening meetings was that of Dr. F. C. Mann, of the Mayo Clinic, who lectured on the "Methods of Medical Progress" now employed by medical science. The interest of geologists in their physical well-being was manifest in the number of questions asked of Dr. Mann at the conclusion of his address.

The chief objectives kept before the conference were the problems of stratigraphy, structure and correlation, but considerable interest was maintained in the erosional history of the region. The stratigraphic sequence from the Pre-Cambrian to the Devonian was examined in some detail and emphasis was given to the separation and definition of several formations of Cambrian age in Wisconsin and Minnesota. Some recent and most interesting discoveries and conclusions regarding the stratigraphy and glacial history of the region are incorporated in the guidebook and will be announced again in forthcoming publications.

The Kansas Geological Society has always extended a hearty invitation to others than its members to join in the field conferences. In consequence a number of students and teachers of the science have regarded the conferences as a postgraduate course and have availed themselves freely of the excursions, the meetings and the personal contacts that characterize the enterprise. Among the registrants for the Upper Mississippi Valley conference were men and women from Alabama, Colorado, District of Columbia, Georgia, Kentucky, Ohio, New York, Pennsylvania, Texas and one from Australia. This is in addition to the persons present from the states involved in and connected with the conference field. Apart from petroleum geologists, the registered group included four state geologists,

three assistant state geologists and at least five other members of state geological surveys: three members of the U. S. Geological Survey, eighteen college and university professors, three members of museum staffs, two engineers, one mining engineer, one member of a state highway commission and an uncounted number of laboratory research investigators and graduate students. The attendance, according to unofficial accounts, was approximately one hundred for a part of the trip and approximately one half that number registered for one of the optional day trips, following the formal adjournment of the conference. The post-conference trips offered either the country of the iron ranges of northeastern Minnesota or the Keweenawan sediments and lava beds of northern Wisconsin, according to the option of the participant.

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SPECIAL ARTICLES

FRACTIONATION STUDIES ON PRO-VITAMIN D

PREVIOUS work from these laboratories[1,2,3] demonstrated: (1) that cholesterol which had been purified by methods which destroyed ergosterol still retained some residual provitamin-D activity; (2) that cholesterol purified by different methods varied somewhat in the amount of residual provitamin D; (3) that the provitamin D of cholesterol purified through the dibromide could be enhanced 100 times by heating this cholesterol at 185°–200° for one hour in the presence of traces of oxygen; and (4) that boiling in an alcoholic solution of sodium hydroxide also enhances the provitamin-D factor, but to a lesser degree. Table I gives a summary of these findings.

TABLE I
EFFECT OF VARIOUS PURIFICATION METHODS ON PROVITAMIN D OF CHOLESTEROL

Sample	Treatment	Daily dose to produce 2+ cure in 10 days	Absorption spectra
Cholesterol W	Commercial product	0.1 mg	Ergosterol bands and general absorption
Cholesterol A	Cholesterol W treated with boiling 10 per cent. NaOH in alcohol, dissolved in ether, washed with water, ether evaporated, residue recrystallized 5X from acetone	2.5 mg	No absorption
Fraction II	Cholesterol separating in emulsion layer between ether solution and water washing	0.1 mg	General absorption
Cholesterol A sublimate	Cholesterol A heated 200°–210° three hours at 7–10 mm pressure	0.1 mg	General absorption
Cholesterol A residue	Residue left in tube after heating	0.1 mg	General absorption
Purified cholesterol	(1) Through the dibromide (2) Boiling 3X with $KMnO_4$ in alcohol (3) Acetylation and acid hydrolysis (4) Acetylation and alkaline hydrolysis	7–10 mg 3 mg 4 mg 1.5 mg	No absorption No absorption No absorption No absorption
Alkaline-treated cholesterol	Cholesterol treated 3X with $KMnO_4$ and boiled 5 hours in 5 per cent. NaOH in alcohol	0.75 mg	Slight general absorption

These findings led to the conclusion that provitamin-D activity is not limited to ergosterol, but that cholesterol itself or a modification of it produced by heat or by alkali or both of these forms also have provitamin-D potency.

Waddell's[4] findings that crude cholesterol and cholesterol purified by boiling in an alcoholic solution of potassium hydroxide, when irradiated, was more effective in preventing leg weakness in chicks than an equivalent number of rat units of irradiated ergosterol led us to test our heated cholesterol in the same manner. Ten groups of white Leghorn chicks were fed the basal ration described by Lachat, Halvorson and Palmer.[5] The following additions were made to the diets of nine of the groups: 0.25 per cent. cod liver oil, 0.25 per cent. 10,000X viosterol diluted 1,000 times, 0.01 per cent., 0.03 per cent., and 0.06 irradiated, heated, purified cholesterol, 0.01 per cent. irradiated filtrate residue from heated cholesterol, 0.1 per cent. irradiated purified cholesterol, and 0.01 per cent. and 0.03 per cent. commercial cholesterol. Table II gives the results obtained.

[1] Fred C. Koch, Elizabeth M. Koch and Ida Kraus Ragins, *Jour. Biol. Chem.*, 85: 141–158, 1929.

[2] Elizabeth M. Koch, Fred C. Koch and Harvey B. Lemon, *Jour. Biol. Chem.*, 85: 159–167, 1929.

[3] Milicent L. Hathaway and F. C. Koch, *Jour. Biol. Chem.*, 108: 773–782, 1935.

[4] J. Waddell, *Jour. Biol. Chem.*, 105: 711–729, 1934.

[5] L. L. Lachat, H. A. Halvorson and L. S. Palmer, *Jour. Assoc. Official Agr. Chem.*, 15: 660–675, 1932.