which they project upward or even directly backward into the oral cavity. The further study of these remarkable "denticles" is in progress.

BARRY J. ANSON

HARVARD MEDICAL SCHOOL,
SEPTEMBER, 20, 1924

THE AMERICAN CHEMICAL SOCIETY

DIVISION OF BIOLOGICAL CHEMISTRY

R. A. Dutcher, *secretary*
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A Study of the Nutritive Value of Gelatin: THOMAS B. DOWNEY. The results of an investigation of the supplementary value of gelatin as a protein where fed with a number of foods common to the dietary, and of the influence of the colloidal properties of gelatin upon the digestion and absorption of various dairy products. Feeding tests with the albino rat have shown that gelatin, as a protein, supplements the protein deficiency of wheat, wheat products, oats, rye, barley and barley products. Gelatin does not, however, increase the food value of navy beans or corn. Further observations have demonstrated that gelatin by virtue of its colloidal properties increases the nutritive value of dairy products, such as cow's whole milk, egg and milk, and ice cream (typical commercial formulas).

The Antirachitic Action of Fresh Cod Liver Oil as Compared with that of a Concentrate Prepared from the Oil: HARRY E. DUBIN. Young rats were placed on a rickets-producing diet for a period of 30 days. During this time, one group of rats received daily doses of varying quantities of fresh cod liver oil. Another group was given an equivalent amount of cod liver oil in the form of a concentrate prepared from the oil. A third group acted as controls. At the end of the experimental period, the animals were X-rayed. The controls showed rickets, while those receiving either cod liver or the concentrate remained free from rickets.

The Physiological Activity of Some Synthetic Compounds Closely Related to Thyroxin: E. C. KENDALL and A. E. OSTERBERG. Alpha oxy-indol propionic acid in glacial acetic acid will substitute bromine on its imino group and HBr will then split out between the N and No. 7 carbon. This bond also occurs in all the halogen substituted derivatives of alpha oxy-indol propionic acid. Experiments have demonstrated the great physiological activity of this bond which under the conditions in the animal organism acts as an active hydrogen acceptor. The relation of this finding to thyroxin and oxidation in the animal organism will be discussed.

A New Type of Organic Phosphoric Acid Compound Isolated from Blood: ISIDOR GREENWALD. A compound which appears to consist of two molecules of phosphoric acid united with one molecule of 1-glyceric acid has been isolated from pig blood, in which it forms at least one third of the total "acid-soluble" phosphorus. It is very resistant to acid hydrolysis. A compound of the same nature is present in the blood of man and the dog but not in that of the cow and the sheep.

Quantitative Determination of Vitamin A: H. C. SHERMAN and H. E. MUNSELL. In order to determine the relative amounts of vitamin A in foods, a method has been developed upon the plan proposed by Drummond, Coward, Zilva and their coworkers. Standardized animals are fed a vitamin-A-free, otherwise adequate diet until growth ceases; and then the amount of food which when fed daily will just suffice to permit a gain in weight of approximately 3 grams per week for 8 weeks is ascertained. Standardization of animals, diets, procedure and interpretation is discussed.

Further Experiments upon Vitamin A: H. C. SHERMAN and L. B. STORMS. This investigation deals with (1) the age at which experimental animals (albino rats) attain their maximum body store of vitamin A, (2) the influence of previous feeding upon the relative store of vitamin A in the body at a given age, (3) the influence of variations in body weight at a standard initial age, (4) the influence of family, and (5) the question whether the sexes differ in their capacity to store vitamin A or to endure deprivation of this vitamin.

A Ration Low in Calcium as a Factor in the Production of "Stiffness" in Swine: L. A. MAYNARD, S. A. GOLDBERG and R. C. MILLER. The trouble in pigs variously referred to in popular language as stiffness, paralysis and rickets was produced on a ration low in calcium, consisting of yellow corn, wheat middlings and oil meal, but did not result where the same feeds were supplemented with bone meal and limestone, nor was it produced on a ration of yellow corn, middlings and fish meal. The femurs of the pigs receiving the low calcium ration contained less than two thirds as much calcium and phosphorus as the femurs of littermates on the other two rations. Corresponding differences were found in the structure of the bones on section. On microscopic examination the bones from the pigs on the ration low in calcium showed marked and constant lesions. The data indicate that the stiffness was a result of inadequate mineral nutrition of the bones due to a ration deficient in calcium.

Vitamin B in Evaporated Milks Made by Vacuum and Aeration Methods: R. ADAMS DUTCHER, EMMA FRANCIS and W. B. COMBS. Sterilized and unsterilized evaporated milks, made by vacuum and aeration methods, were fed to rats receiving a ration deficient in Vitamin B. Control groups were fed equivalent amounts of raw herd milk from which the evaporated milks were made. The results indicate that evaporation (by vacuum and aeration methods) did not injure Vitamin B appreciably, although slight destruction took place. After sterilization of the evaporated milks, the destructive effect was more marked, particularly in the evaporated milks made by the aeration method. The destructive effect can hardly be considered of serious nutritive significance.

Work is now in progress relative to the effect of evaporation and sterilization on Vitamins A and C.

The Significance of the Occurrence of Copper, Manganese and Zinc in Shell-Fish: J. S. McHARGUE. Small amounts of the elements copper, manganese and zinc are widely distributed in nature. The author found, in parts per million of the moisture-free matter, copper, iron, manganese and zinc in the following species of shellfish: Crayfish, 75 cu; 896 Fe; 250 Mn; 320 Zn. Mussel, 12 cu; 1,325 Fe; 5,424 Mn; 750 Zn. Clam, 16 cu; 711 Fe; 43 Mn; 1,359 Zn. Oyster, 231 cu; 208 Fe; 49 Mn; 4,284 Zn. Lobster (edible meat) 85 cu; 54 Fe; 12 Mn; 160 Zn. Crabs (entire bodies), 68 cu; 134 Fe; 16 Mn; 1,216 Zn. The author assumes that copper, manganese and zinc are vitally concerned in the metabolism of shell-fish and are probably vital factors in the metabolism of higher animals as well.

The Relation of Phenols to Xerophthalmia, Calcium-Phosphorus Retention and Growth: R. C. HUSTON and H. D. LIGHTBODY. White rats received a diet high in calcium and low in phosphorus of the following percentage composition: Purified casein (20), dextrin (59.6); hydrogenated cotton seed oil (14), salt mixture (McCollum's XXI) (3.9), calcium carbonate (1.5) and butter fat (1.0). Water soluble B vitamin was supplied by feeding "Yeast Vitamin (Harris)." Another group received the same diet containing 0.05 per cent. hydroquinol. Growth curves, tables of calcium-phosphorus balance, post-mortem examination and date of development of xerophthalmia lead to the conclusion that hydroquinol exerts a protective influence against the development of xerophthalmia and improves the general well-being of the rats, permitting growth and aiding calcium and phosphorus retention.

Studies of the Vitamin Potency of Cod Liver Oils. XIV—The Variation in Daily Food Consumption of Experimental Animals: ARTHUR D. HOLMES. The daily food consumption of over two hundred albino rats have been averaged to determine the average daily food consumption during the experimental period of sixty days. The information obtained in this manner shows that the average food consumption varied from day to day. It was also found that on each of the sixty days the food consumption of a large portion of the experimental animals was not within 10 per cent. of the average food consumption of the group. From this it is evident that if one wishes to feed uniform daily amounts of cod liver oil to experimental animals, this can be more satisfactorily accomplished by feeding the oil apart from the diet rather than as a component of the experimental diet.

Studies of the Vitamin Potency of Cod Liver Oils, XV—Characteristics of Crude Cod Liver Oil, Medicinal Cod Liver Oil and Cod Liver Stearin: ARTHUR D. HOLMES and MARGARET M. PATCH. Under modern methods of manufacture, the crude cod liver oil obtained by promptly rendering strictly fresh cod livers is satisfactory for edible purposes in so far as color, odor and taste are concerned. Crude cod liver oil, however, contains cod liver stearin, which solidifies at winter temperatures, causing the oil to become cloudy and at extreme temperatures semi-solid. To produce a non-freezing cod liver oil, the crude cod liver oil is chilled and separated into medicinal cod liver oil and cod liver stearin. Analyses of a number of lots of medicinal cod liver oil, cod liver stearin and the crude oil from which they were obtained show that the chemical and physical characteristics of the crude cod liver oil and the medicinal cod liver oil obtained from it are very similar.

Studies on Cholesterol. I. Synthesis of Cholesterol in the Animal Body: F. S. RANDLES and ARTHUR KNUDSON. In order to determine whether or not cholesterol is synthesized by the animal body, a number of white rats were placed at the time of weaning on a cholesterol free diet. Another series of rats were placed on exactly the same diet to which known amounts of cholesterol had been added, and still another series were kept on the ration diet used for stock animals. The offspring from each series were continued on the diet of the parent rats. At about 5 months of age the rats were killed and the blood, brains and livers were extracted and the cholesterol content of these tissues determined. This has now been carried through the second generation in each case. In every case the cholesterol content of the tissues of the rats receiving no cholesterol in their diet has been as high as that of the other rats, indicating a synthesis of cholesterol by the animals on a cholesterol free diet. The growth and appearance of the cholesterol free rats have been normal.

Methemoglobin: J. B. CONANT and L. F. FIESER. Methemoglobin may be determined by electrometric titration with sodium hydrosulfite or anthrahydroquinone sulfonate. Results thus obtained, when compared with the total hemoglobin content (colorimetric) and the oxygen capacity, affords additional proof that the change from methemoglobin to hemoglobin involves one hydrogen equivalent of reducing agent. A new method of determining methemoglobin in the presence of cleavage products has been developed which depends on the fact that methemoglobin may be quantitatively reduced to hemoglobin, whose oxygen capacity can then be measured. A study has been made of some of the factors influencing the decomposition of hemoglobin solutions and the formation of methemoglobin by a variety of oxidizing agents.

The Antirachitic Activation of Crude Fats and Other Substances by Exposure to Light: H. STEENBOCK, A. BLACK and M. T. NELSON. Following up the work of Goldblatt and Soames, it has been found that tissues, rations and crude fats, which possess little or no antirachitic properties, may become activated and possess marked antirachitic properties after exposure to light. In the case of fats the antirachitic properties are localized in the unsaponifiable constituents of the fat.

R. A. DUTCHER,
Secretary.