it is desired to make is that the range of equally favorable ratios between nutrient salts is probably a very broad one, no doubt including the solutions of most soils. This is not a surprising conclusion in view of the observation that under proper climatic conditions many different types of plants can grow vigorously on any fertile soil, while a given type of plant may grow equally well on various soils, the extracts of which have entirely different proportions of nutrients. Again, plants of equal development may store nutrient elements in very different ratios, when grown in different soils or solutions.

It has sometimes been suggested that solution and sand culture experiments offer a fundamental means of determining fertilizer requirements of soils, in connection with a proper physiological balance for the plant. If one considers the dynamic nature of the soil system, with its constantly fluctuating soil solution and the reactive properties of the soil minerals, it seems scarcely within the limits of possibility to alter a soil solution to fit any particular ratio of nutrients. The addition of any one fertilizer salt may affect all the various components of the soil solution. Moreover, many elements are present in the soil solution besides those added to the artificial culture solutions and it may not be assumed that these are without effect on the physiological balance of the solution, if indeed such a balance is of importance ordinarily.

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THE AMERICAN CHEMICAL SOCIETY, CHICAGO MEETING

The 60th meeting of the American Chemical Society was held in Chicago, Ill., Monday, September 6, to Friday, September 10, 1920. The council meeting was held on the 6th and a general meeting on September 7th, in the morning at the Congress Hotel, Chicago, and in the afternoon at Northwestern University, Evanston. Divisional meetings were held all Wednesday morning and all day Thursday, and excursions Wednesday afternoon and Friday. Full details of the meeting and program will be found in the October issue of the *Journal of Industrial and Engineering Chemistry*. The registration was one thousand three hundred and eight.

The combined outdoor and indoor entertainment on the campus of Northwestern University on Tuesday afternoon was a new feature which met the hearty approval of all as it offered both a varied entertainment to the members and special opportunity for becoming acquainted.

General public addresses were given by Thomas E. Wilson, president, Wilson & Co., on "The value of technical training in the reconstruction of industries," and by Professor A. S. Loevenhart, head of the department of pharmacology of the University of Wisconsin, on "Chemistry's contribution to the life sciences." The chief public address was the president's annual address given by Dr. W. A. Noyes, in the Gold Room of the Congress Hotel, and was entitled, "Chemical publications." General addresses on Tuesday afternoon were given by H. P. Talbot on "Relation of educational institutions to the industries," and by W. A. Patrick on "Some uses of silica gels." The banquet, held on Thursday evening, September 9, filled the Gold Room of the Congress Hotel to overflowing. At the general opening session Charles L. Parsons reported on the International Conference of Pure and Applied Chemistry held in Rome, June 22 to 25, of which he was vice-president and to which he was a delegate from the American Chemical Society.

Abstracts of a larger part of this paper presented follows:

Division of Biological Chemistry

R. A. Gortner, *chairman*,
A. W. Dox, *secretary*

Diet and sex as factors in creatinuria in man: Howard B. Lewis and Genevieve Stearns. There appears to be no direct relation between the phases of the menstrual cycle and the appearance of creatine in the urine of the normal adult female. Protein *per se* is not a causal factor in the production of creatinuria and there is no more tendency toward the production of creatinuria by high protein diets during the menstrual than in the intermenstrual periods. The retention of creatine ingested *per os* by women does not differ markedly from that by men.

The nutritive value of the proteins of tomato seed: CARL O. JOHNS and A. J. FINKS. Nutrition experiments with albino rats have shown that normal growth can be obtained when the sole source of protein in a diet is furnished by tomato seed press cake. The protein content of the diet was approximately 18 per cent. and it was made adequate with respect to the non-protein dietary constituents.

Hydrolysis of the globulin of the coconut, Cocos Nucifera: D. BREESE JONES and CARL O. JOHNS. The globulin of the coconut has been hydrolyzed, and the resulting amino acids determined. By changing the order of procedure usually followed in connection with protein hydrolysis, and by applying several rather recently described methods, 78.15 per cent. of the hydrolysis products of the protein used has been identified and determined. The order of procedure followed in the isolation and determination of the amino acids was as follows: removal of the hexone bases with phosphotungstic acid: separation of most of the glutaminic acid as the hydrochloride: precipitation of the remaining dibasic amino acids as their calcium salts: extraction of proline and peptide anhydrides with absolute alcohol; esterfication of the remaining amino acids by means of the lead salt method of F. W. Foreman: fractional distillation of the esters under reduced pressure, and finally, regeneration and isolation of the amino acids in the usual manner.

The globulin of the cohune nut, Attalea Cohune: CARL O. JOHNS and C. E. F. GERSDORFF. The globulin has been extracted and analyzed. Its analysis reveals a similarity to that of the coconut globulin. Like the coconut globulin it contains relatively high percentages of arginine and lysine, one half of the latter as determined by the Van Slyke method agrees fairly well with the free amino nitrogen of the protein. The globulin gives a strong test for tryptophane. A trace of albumin has been shown to be present.

Some proteins from the mung bean, Phaseolus Aureus (Roxburgh): C. O. JOHNS and H. C. WATERMAN. The Mung bean contains about 21.74 per cent. of protein ($N \times 6.25$). Experiments with sodium chloride in various concentrations indicated a 5 per cent. solution as the most effective extractant; it dissolved 19.0 per cent. of protein from the finely ground seed. The saline extract yielded two globulins, designated the α- and β-globulins, by fractional precipitation with ammonium sulfate and by subsequent purification of the fractions as described. The yields were 0.35 per cent. and 5.75 per cent., respectively, of the dry material extracted. Traces of an albumin, also, were obtained from extracts from which all the globulin had been precipitated by prolonged and repeated dialysis. The albumin remained in solution during the dialysis and was separated by slightly acidifying and coagulating at 45° C. The yield was from 0.02 to 0.05 per cent. of the bean meal. Analyses showed marked differences in the nitrogen- and sulfur-content of the three proteins. The globulins were still further distinguished from each other by considerable differences in their percentages of the basic amino-acids, determined by Van Slyke's method. The β-globulin contained so little cystine that remaining undecomposed after hydrolysis escaped precipitation by phosphotungstic acid and could not be determined by Van Slyke's method.

The effect of the fat-soluble vitamine content of a feed on the fat-soluble vitamine content of adipose tissue: J. S. HUGHES. The high fat-soluble vitamine content of beef fat as compared to lard has been explained on the grounds that the ordinary feeds used for steers contain more of this vitamine than the feed usually used for hogs. This explanation implies the assumption that the fat-soluble vitamine content of the tissue can be changed by varying the content of this vitamine in the feed. In order to secure some experimental data on this subject, a number of animals including rabbits, hogs, dogs, hens and ducks were fattened on feed both high and low in the fat-soluble vitamine content. The adipose tissues from these animals were rendered, care being taken not to allow the temperature to go much above the melting point of the fats. The relative fat-soluble vitamine content of the fat from each animal was determined by using it as the only source of this vitamine in an otherwise adequate diet. In no case did the results indicate that the fat-soluble vitamine content of the adipose tissue could be increased by increasing the amount of this vitamine in the feed.

Further studies upon the local anesthetic and antiseptic action of saligenin and its mercury derivatives and allied compounds: ARTHUR D. HIRSCHFELDER, MERRILL C. HART, and F. J. KUCERA. Strong solutions of saligenin can be used as a local anesthetic in cystoscopy and dilatation of the male and female urethra. Saligenin is a mild antiseptic and is an analgesic in chronic

arthritides, but we have not found any chemotherapeutic action against trypanosomes or spirochaetes. A di-mercury compound of saligenin has been prepared by refluxing saligenin with 2 mols. of mercuric acetate in dilute alcohol on a water bath for several hours. The sodium salt of this is water soluble and is an excellent antiseptic, about as good as $HgCl_2$ but 1:1000 solutions are non-irritating to mucous membranes, and are being used successfully in the treatment of gonorrheal urethritis. An acetate of this substance has also been prepared.

The occurrence of diastase in the sweet potato in relation to the production of sweet potato sirup: H. C. Gore. In the production of sweet potato sirup the potatoes are cooked until soft, crushed finely and mixed with 2 parts of water. Three per cent. of ground barley malt is then added, and the mixture digested at 60°–65° C. for from 20 minutes to one hour. During the time nearly all of the starch is changed into maltose and dextrin. Separation of the soluble solids from the insoluble pulp is easily made by use of the rack and cloth type of press or by suction filtration; and the wort is then evaporated into sirup. The yield of sirup is at least 30 per cent. of the weight of potatoes taken. The pulp remaining amounts to 5 per cent. of the weight of potatoes, and may be dried and used for feed. The crude sirup can be used for all cooking purposes for which similar sirups are employed.

Polyneuritis as influenced by the amount of protein and carbohydrate present: A. D. Emmett.

The acid-base balance in animal nutrition. IV. The tolerance of rabbits to acid rations over long periods of time: A. R. Lamb. Rations complete from the standpoint of nutrition and as nearly as possible of proper physical character for rabbits were so planned from combinations of oats, alfalfa meal, casein and normal sulfuric acid solution, as to furnish a slight excess of acid-forming mineral elements. This excess of acid in the ration was equivalent to about 3 to 5 cc. normal acid solution per rabbit per day. On this ration several rabbits have made normal growth, and one female which has received the ration for eleven months has reproduced successfully, and her progeny have made their entire growth to maturity on the same ration. Most of the acid is excreted normally as phosphates. The ammonia production in the second generation, however, is increased from an average of 0.5 per cent. of the total urinary nitrogen to an average of 2.0 per cent. on the same ration, a possible adaptation to the abnormal acid character of the ration. This work is being continued.

Further studies on the effect of a deficiency of fat-soluble vitamine: V. E. Nelson and Alvin R. Lamb. Rabbits fed upon a ration of casein, dextrin, salts, wheat embryo and extracted alfalfa, containing practically no fat-soluble vitamine but otherwise complete, invariably develop xerophthalmia. The time of the onset of this symptom varies directly with the age of the rabbit and occurs in young rabbits in four to eight weeks time. A ration consisting of oats, gelatin, salts and extracted alfalfa produced from three to eight weeks before the death of the rabbit. Attempts to induce the disease in the eyes of rats on the same ration by inoculating with the exudate from the eyes of affected rabbits did not succeed. It has not yet been possible to produce the disease in chickens or guinea pigs.

The hydrogen ion concentration of the contents of the small intestine: J. F. McClendon. Determinations were made on two healthy men about 25 years of age on a mixed diet and the following readings obtained: Subject No. 1, pH = 5.1, 4.5, 4.9, 4.1, 4.2, 6.5, average 4.9; subject no. 2, pH = 4.5, 5.2, 4.4, 6.2, 6.4, 5.9, average 5.4. The determinations were made by passing a rubber tube, 1.5 mm. bore with 6 gram weight attached through the mouth until it extended 7 feet into the alimentary canal. The tube was allowed to remain in place 5 days and 4 nights while the subjects followed their accustomed occupations. The contents passed out of the tube into a hydrogen electrode vessel. The electrode was made of gold, plated with irridium and was totally immersed in the sample when the readings were taken.

Charles L. Parsons,
Secretary

(*To be continued*)

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