

dipping in the same solution is a small platinum-wire point sealed into a glass tube. The best size for the electrodes varies with the current. The whole cell is enclosed in an atmosphere of hydrogen. When a current passes from the large to the small electrode through the liquid, hydrogen goes into solution at the large cathode and an equal quantity is liberated at the anode. On reversing the current, the small point-electrode becomes the anode and the oxygen polarization prevents the passage of the current, provided the impressed electromotive force is not too great; in the latter case several cells are connected in series.

**A Method for the Determination of Electrical Conductivity with Direct Current Instruments.** BY J. LIVINGSTON R. MORGAN AND W. L. HILDBURGH. *J. Am. Chem. Soc.*, 22, 304-307.—An alternating-current generator is connected in series with the electrolytic cell and a non-inductive resistance. Around the latter is shunted a galvanometer and a hydrogen cell for rectifying the alternating current (see preceding review). The deflection of the galvanometer is noted, and then a non-inductive resistance is substituted for the conductivity cell, and adjusted until the same deflection as before is indicated by the galvanometer. With the ordinary Kohlrausch electrolytic cell and an alternating voltage of two volts the authors state that the results agree satisfactorily with those obtained by the usual Kohlrausch method.

---

## BIOLOGICAL CHEMISTRY.

A. G. WOODMAN, REVIEWER.

**The Proteids of the Egg Yolk.** BY THOMAS B. OSBORNE AND GEORGE F. CAMPBELL. *J. Am. Chem. Soc.*, 22, 413-422.—Salt solutions dissolve from egg yolk a mixture of protein compounds with lecithin, containing from 15 to 30 per cent. of lecithin. This lecithin is not removed by ether, but readily by alcohol. The resultant lecithin-free proteid obtained by fractional precipitation has a constant composition. The conclusion drawn is that the protein of egg yolk is principally a lecithin compound, soluble in salt solutions, and in its behavior resembling a globulin.

**The Protein Constituents of Egg White.** BY THOMAS B. OSBORNE AND GEORGE F. CAMPBELL. *J. Am. Chem. Soc.*, 22, 422-450.—In a previous paper (*this Rev.*, 5, 110) Osborne described preparations of crystallized egg albumin which indicated that with the substance ordinarily known as ovalbumin there are associated other protein bodies. The authors have since repeated the work on a larger scale, confirming the earlier observations, and are able to present a number of facts concerning these and other protein substances.

**The Nucleic Acid of the Embryo of Wheat and Its Protein Compounds.** BY THOMAS B. OSBORNE AND GEORGE F. CAMPBELL. *J. Am. Chem. Soc.*, **22**, 379-413.—The authors find that gliadin and glutenin, the principal proteid constituents of the endosperm of wheat, are not present in the embryo. The embryo does contain a nucleic acid different from any form as yet described, as well as leucosin, a globulin, and proteose. It is probable that the embryo contains a number of compounds formed by varying combinations of these protein substances with the nucleic acid.

**On the Phosphorus Content of the Paranuclein from Casein.** BY HOLMES C. JACKSON. *Am. J. Physiol.*, **4**, 170-177.—The paranuclein obtained by digestion of casein with pepsin-hydrochloric acid is shown to contain considerable amounts of phosphorus in organic combination. The results of previous investigators, who found that the phosphorus recovered in the ash of their preparations was equivalent to the total phosphorus content of the paranuclein, are attributed to the high ash content of their products. When the latter is avoided, and thus the formation of inorganic phosphates during ignition is prevented, paranuclein yields over two per cent. of organic phosphorus.

**On Uric Acid Formation after Splenectomy.** BY LAFAYETTE B. MENDEL AND HOLMES B. JACKSON. *Am. J. Physiol.*, **4**, 163-169.—The experiments of the authors indicate that the spleen is not the chief organ involved in uric acid production in the living body, and further, that it is doubtful if it plays any part whatever in this process. No diminution in uric acid production was observed in any case after splenectomy. They consider it improbable that the formation of uric acid in the mammalia can be assigned at present to any definite organ, or groups of organs.

**The Occurrence and Origin of the Xanthine Bases in the Feces.** BY WILLIAM H. PARKER. *Am. J. Physiol.*, **4**, 83-89. From experiments on a healthy man of average body-weight the general conclusion is drawn that under normal conditions on a diet containing no nucleins there is always a constant excretion of combined xanthine bases derived from the cells of the alimentary canal. This excretion is increased to nearly double the usual amount when food containing nucleins or food rich in alloxuric bodies, as meat or meat extracts, is consumed. This increase is not necessarily due directly to the ingested food, but may arise indirectly from an influence exerted on the processes of metabolism and secretion.

**An Experimental Study of Oxaluria, with Special Reference to Its Fermentative Origin.** BY HELEN BALDWIN. *J. Expt. Medicine*, 5, 27-46.—The results of a number of experiments are given to show that in health no oxalic acid, or only a trace, is formed in the body, that present in the urine having been ingested with the food. In certain cases, however, in which free hydrochloric acid was absent from the gastric juice, it is considered that oxalic acid was formed in the organism itself, this formation being connected with fermentation in the alimentary canal.

**On the Connective Tissue in Muscle.** BY J. H. GOODMAN. *Am. J. Physiol.*, 4, 260-263.—In a recent paper describing a new method for the determination of connective tissue in muscle, Schepilewsky (*Archiv. für Hygiene*, 34, 348) speaks of the occurrence of mucin in muscle. The author has isolated and examined this so-called mucin. No carbohydrate could be obtained from it, and it was found to contain less than 0.01 per cent. of phosphorus and an average of 16.11 per cent. of nitrogen. These results indicate that the material is neither a glycoprotein nor a nucleoprotein. It resembles more closely the "stroma substance" obtained by von Holmgren from horse and rabbit muscle.

**On the Occurrence of Iodine in Corals.** BY LAFAYETTE B. MENDEL. *Am. J. Physiol.*, 4, 243-246.—The author has found considerable quantities of iodine, varying from 0.28 to 1.70 per cent., in three specimens of West Indian corals, and submits the results as additional evidence in favor of Drechsel's belief that for many organisms there is a specific iodine metabolism which is essential to the building up of the axial skeleton.

**Glycogen Formation after Inulin Feeding.** BY R. NAKASEKO. *Am. J. Physiol.*, 4, 246-250.—The well-known experiments of Miura (*Ztschr. für Biol.*, 32, 255) have been repeated, using large portions of inulin and allowing the absorption to proceed during longer intervals than before. In only three cases was an increase of glycogen in the liver above the starvation maximum observed, showing that the glycogen-forming properties of inulin must still be regarded as uncertain or minimal.

**The Influence of Acids on the Amylolytic Action of Saliva.** BY G. A. HANFORD. *Am. J. Physiol.*, 4, 250-260.—The author endeavors to show that contrary to the conclusions of Kubel (*Archiv. für ges. Physiol.*, 66, 276), it is impossible to point out any percentage of acid or alkali which inhibits salivary digestion in a definite degree. The character of the action is depend-

ent also upon the absolute amount of saliva and the variation in the quantity of proteid matter present. Whenever *free* hydrochloric acid is present a certain degree of inhibition is always the result.

**Investigations on the Determination and Composition of Humus and Its Nitrification.** BY CHARLES RIMBACH. *J. Am. Chem. Soc.*, 22, 695-703.—The author's experiments are a direct verification of the assumption previously made, that the *matière noire* of Grandeau is a definite source of nitrates through nitrification. In studying the Grandeau method for the determination of humus, it was found that soda solution extracts more nitrogen than does ammonia, but the question still remains, which of the two is the best solvent for humus substance, by which is understood the sum of all organic substances, decomposed or not, which are immediately available as plant food.

**An Experimental Study of the Gas-producing Power of *Bacillus Coli Communis* under Different Conditions of Environment.** BY MARY ENGLE PENNINGTON AND GEORGE C. KÜSEL. *J. Am. Chem. Soc.*, 22, 556-567.—*Bacillus coli communis* has been cultivated under the most nearly concordant conditions possible, and the gas produced has been examined chemically. The results obtained show great irregularity, but in general there seems to be an intimate relation between the production of hydrogen and nitrogen. The carbon dioxide is liberated in greatest quantity at the beginning of the fermentation.

**On Certain Peculiarities in the Urine of Vegetarians.** BY J. H. LONG. *J. Am. Chem. Soc.*, 22, 592-595.—The relation of uric acid to creatinin in normal urine is about 1 : 2; in the urines examined it was about 1 : 1.2. This is attributed to low food consumption and consequent low proteid metabolism. The observed distribution of reducing power shows that a vegetable diet, consisting largely of carbohydrates and fats, tends to increase the non-nitrogenous factors in the urine.

**The Fractional Precipitation of the Globulin and Albumin of Normal Horse's Serum and Diphtheria Antitoxic Serum, and the Antitoxic Strength of the Precipitates.** BY JAMES P. ATKINSON. *J. Expt. Medicine*, 5, 67-75.—The globulins of both normal and diphtheria antitoxic serum behave similarly toward chemical reagents. All of the diphtheric antitoxic power of both normal and immunized serum is always carried by the globulin and its fractional precipitates. During the fractional precipitation of the globulin some of it is lost and at the same time some of the antitoxic power of the globulin of the immunized serum is lost. These observations, together with the observed fact that

normal horse's serum contains an antitoxin which separates with the globulin, lead to the conclusion that "diphtheria antitoxin" is a form of globulin.

**Adlumia Cirrhosa—A New Protopine-bearing Plant.** By J. O. SCHLOTTERBECK. *Am. Chem. J.*, 24, 249-253.—The roots of this plant have been found to contain about one per cent. of an alkaloid melting at 207° (corr.). Not enough of the alkaloid was obtained to make a combustion of it, but in its crystalline form, solubility, melting-point, and principal chemical reactions it agrees exactly with the *protopine* from *Bocconia cordata* and from opium. The author further considers it probable that protopine is identical with fumarine, the alkaloid of most frequent occurrence in the *Fumariaceae*.

**Assay of Drugs by the Use of Living Plants.** By HENRY KRAEMER. *Am. J. Pharm.*, 72, 472-485.—From the results obtained it may be said generally that the rate of growth of certain plants in solution containing toxic principles is inversely proportional to the toxicity of the solution. There seems to be a definite solution of alcohol or nux vomica alkaloids that is toxic, and with solutions containing different amounts of alcohol or nux vomica alkaloids there is a definite measure of growth depending upon the quantity present.

**The Digestibility of Some Non-nitrogenous Constituents of Certain Feeding-stuffs.** By G. S. FRAPS. *J. Am. Chem. Soc.*, 22, 543-552.—The author has determined the digestibility of certain groups of the proximate constituents of various feeding-stuffs, and finds that the probable order of digestibility is: sugars, starches, pentosans, crude fiber, residual nitrogen-free extract, and pentosans in the crude fiber. The constituents of the nitrogen-free extract, in the order of digestibility, are: sugars, starches, pentosans, and residue.

**The Digestibility and Nutritive Value of Bread.** By CHAS. D. WOODS AND L. H. MERRILL. *U. S. Dept. Agr., Expt. Sta. Bull.* 85, 1-51.—This bulletin is a report of progress in the extensive investigation undertaken to determine the effects of milling upon the resulting flours. The full discussion is reserved until further results are available. The work reported includes: digestion experiments with men in which bread formed the main diet; experiments upon the artificial digestion of bread with pepsin; a study of the income and outgo of nitrogen; a study of metabolic nitrogen in feces in a period with a diet of carbohydrates alone, and in a period of complete and in one of partial fasting; an investigation of the nutritive value of bread made with skim-milk as compared with that made from water; and experiments on the losses of material in baking bread.

**Nutrition Investigations at the Cal. Agr. Expt. Station.** By M. E. JAFFA. *U. S. Dept. Agr., Expt. Sta. Bull.* 84, 1-39.—Dietary studies have been made on a football team and on a chemist's family, and a number of dietary studies and digestion experiments have been made on infants. In one instance the metabolism of nitrogen by an infant has been studied. The studies of infants are especially interesting because of the meagerness of statistics in this line. The facts brought out show clearly the need for more study in this direction before definite conclusions can be drawn, especially with infants under one year old. The variations in the amount of protein show that there can be little comparison of the dietaries of infants under seven months old. From the seventh to the twelfth month there is more regularity, and after the first year the consumption is quite uniform.

**The Wide Occurrence of Indicators in Nature.** By G. S. FRAPS. *Am. Chem. J.*, 24, 271-276.—The results of the author's work show the very common occurrence of indicators in nature. Some seventy-four kinds of colored flowers and leaves were examined after extraction with water or dilute alcohol. In nearly every case the extract became one color when acid and another when alkaline. Some of the changes were very sharp, and, as a rule, the coloring-matter was fairly sensitive as an indicator, being changed by from less than 1 to 2 drops of tenth-normal ammonia.

**The Nature of Commercial Sanguinarine Nitrate.** By J. O. SCHLOTTERBECK. *Pharm. Rev.*, 18, 358-362.—Examination of several samples of commercial sanguinarine nitrate showed them to consist either of nearly pure chelerythrine, the methyl derivative of sanguinarine, or of a mixture of all the alkaloids of sanguinaria with more or less of its decomposition-products.

E. H. RICHARDS, REVIEWER.

**Principles of Water Analysis as Applied to New Mexico Waters.** By ARTHUR GOSS. *N. M. Agr. Expt. Sta., Bull.* 34, 55-106.—This bulletin gives tables of mineral contents of some 200 waters from different parts of the state, thus furnishing valuable data for future work. A case is given of the use of a water containing 440 parts of total solids per 100,000 without any inconvenience by those accustomed to it, though it was liable to cause severe illness in strangers. The usual limit of 57 parts for either potable or irrigation water cannot be adhered to in New Mexico.

G. W. ROLFE, REVIEWER.

**On the Digestion and Assimilation of Pentosans and Furfuroids.** By C. F. CROSS, E. J. BEVAN, AND J. S. REMINGTON.

*J. Am. Chem. Soc.*, 22, 630-634.—Attention is drawn to the fact that no pentosan is really known to exist, and that there is no proof that the pentoses as such are actually in the plant, the balance of evidence pointing to their formation by oxidation of hexose compounds. In fact, the authors lead us to infer that the processes employed in the separation and identification of the pentoses may possibly be the cause of their formation, a point already made by others. On this account the authors propose to define these reputed compounds identified by the furfural reaction, as *furfuroids* (furfural-gebende substances) confining the name pentosan to the theoretical "pentose-anhydride" or the pentose analogue of starch. The results of experiments with cellulose hydrolysis products fed to rabbits show that almost the whole of these "furfuroids" were digested. This is which quite contrary to the result obtained in feeding pentose sugars, are known to be practically indigestible.

**Sugar Beets, 1899.** BY J. T. WILLARD AND R. W. CLOTHIER. *Bull. Kan. Sta. Agr. Col.*, 94, 49-55. **Experiments in the Cultivation of the Sugar Beet in Nebraska.** BY H. H. NICHOLSON AND T. L. LYON. *Bull. Neb. Agr. Expt. Sta.*, 60, 3-34. **Sugar Beet Investigations in 1899.** BY J. L. STONE AND L. H. CLINTON. *Bull. Cornell Univ. Agr. Expt. Sta.*, 182, 368-385. **Sugar Beets in Sanpete and Sevier Counties.** BY LUTHER FOSTER. *Bull. Utah Agr. Col. Expt. Sta.*, 63, 3-22. **Sugar Beets and Sorghum Investigations in 1899.** BY A. D. SELBY. *Bull. Ohio. Agr. Expt. Sta.*, 115, 175-192.—The titles sufficiently indicate the scope of these bulletins.

**The Inversion of Cane Sugar in Various Pharmaceutical Preparations.** BY A. H. WALTERSDORF AND W. O. RICHTMANN. *Pharm. Arch.*, 3, 81-94; 102-109.—The article describes an extensive investigation into the inverting effect of the ingredients of the more common syrups and elixirs on the sugar present in these preparations. The work was carried out under three temperature conditions representing the greatest, least, and average room temperatures.

---

## ANALYTICAL CHEMISTRY.

### PROXIMATE ANALYSIS.

A. G. WOODMAN, REVIEWER.

**Estimation of Fat in Condensed Milk.** BY ALBERT E. LEACH. *J. Am. Chem. Soc.*, 22, 589-591.—Twenty-five cc. of the diluted milk, corresponding to 10 grams of the original sample, are measured into a Babcock whirling-bottle. Water and