then left town, from whom I subsequently learned that the ulcer had entirely gone. From that time to the present writing (a period of over three years) it has never returned.

CASE II. M. N., female, widow, mother of six living children. Her occupation, that of washerwoman, obliges her to be much upon her feet. She was troubled with eczema of one leg (which was easily cured), with varicose veins of the legs, and with a small, irritable ulcer, of about two years' standing, near the ankle of the right leg. The ulcer was treated in the same manner as in the first case under consideration; and in two or three treatments the ulcer healed. She was advised to wear a linen or cotton bandage in the place of the ordinary elastic one, on account of its causing so much irritation to the leg. I kept her under observation for nearly a year during which time there was no re-appearance of either eczema or of the ulcer.

Medical Progress.

REPORT ON PHYSIOLOGICAL CHEMISTRY.

BY J. BERGEN OGDEN, M.D., BOSTON.

ACID SECRETION BY THE KIDNEYS.

CUSHNY¹ who has made a study of this subject has found that the reaction of the urine varies within strict limits in diuresis; it is never alkaline to phenolphthalein nor acid to methyl orange, and thus corresponds approximately to the interval in reaction between mono- and di-sodic phosphate. The intravenous injection of most saline diuretics is followed by a marked fall in the percentage acidity, partly because the phosphates are present in only small amount, and partly because the absorption in the tubules is deficient. Phosphates injected intravenously give an acid reaction to the urine which is especially marked when the diuresis is partially prevented by increasing the absorption in the tubules. This is explained by the hydrolytic dissociation of the phosphates of the glomerular fluid which permits of the absorption of the cation along with the hydroxyl or carbonate anions; these are capable of permeating the epithelium, while the phosphate anion fails to penetrate it so freely and remains in the tubules along with the hydrogen cations replacing the original ones.

The essential features in the secretion of acid urine are (1) the presence of salts in the glomerular fluid which are capable of extensive hydrolysis, and (2) insufficient absorption in the renal tubules.

LIPASE IN THE URINE.

Hewlett,² in his work on the occurrence of lipase in the urine as a result of experimental pancreatic disease, has evolved the following method for the qualitative and quantitative determination of lipase in the urine:

Method: "Five cubic centimeters of urine are placed in each of three flasks. The urine in the second flask is then boiled. To the urine in the third flask are added three drops of a 1% solution of phenolphthalein and $\frac{N}{10}$ NaOH solution is allowed to run in from a burette until a pink color

appears. The amount of NaOH is read off and a like amount is added to the first and second flasks. To each of these two flasks, the first of unboiled urine, the second of boiled urine, is then added $\frac{3}{10}$ cc. of ethyl butyrate and $\frac{1}{10}$ cc. of toluene, and they are placed in a thermostat at 39° C. for about twenty-four hours. The toluene is added to prevent the growth of bacteria. At the end of this time each flask is taken out and sufficient $\frac{N}{10}$ HCl is added to more than neutralize the alkali previously added by $\frac{5}{10}$ cc. Each specimen is then shaken in a separating funnel with 50 cc. of redistilled ether, and the ether is separated. After adding three drops of a 1% solution of phenolphthalein to 25 cc. of pure alcohol, the latter is brought to the neutral point. The ether extract from the separating funnel is now added to the neutralized alcohol and its acidity is determined by titrating with $\frac{N}{20}$ KOH solution. Any decided difference between the acidity of the ethereal extracts of the boiled and the unboiled urine is due to the butyric acid formed by the cleavage of the ethyl butyrate, and when the difference in acidity is at all great, the odor of butyric acid can be easily recognized. This method of determining lipase is simple and is sufficiently accurate for the amounts of lipase which occur in the urine under certain pathological conditions."

From the author's extensive research he draws the following conclusions: (1) It is possible to show the presence of lipase in the urine and to roughly estimate the quantity present. (2) Very little, if any, lipase is present in normal urine. (3) Lipase appears in the urine after a variety of insults to the pancreas of the dog. (4) It was found in greatest quantity as a result of experimental acute hemorrhagic pancreatitis. (5) It was also found over a period of from three to five days after obstruction of the pancreatic duct. (6) It is probable that severe pancreatic trauma may cause the appearance of lipase in the urine. (7) The above are some of the conditions in which fat necroses are most apt to occur in human pancreatic disease.

THE BLOOD AND URINE IN ECLAMPSIA.

Zangemeister³ has made a comprehensive research of the blood and urine in eclampsia. He determined the alkalinity of the blood, the amount of chlorides, concentration of the serum, and the freezing point; and in the urine, the proportion of constituents, and the "chloride quotient," — the relation between the chlorides and the total salt molecule. He found that the blood contained an abnormally high percentage of globulin evidently due to loss of plasma. The "chloride quotient," which was found to average normally 40%, in eclampsia was found to be as low as 20%. This phenomenon he considers probably the result of an interference with the circulation through the kidneys, manifestly due to contractions of the blood vessels in the kidneys causing anemia of these organs; furthermore, that these contractions are synchronous with the labor contractions

¹ Journal of Physiology, vol. xxxi, nos. 3 and 4.

² Journal of Medical Research, vol. xi, 1904.

³ Zeitschr. f. Geburts. u. Gynäkologie, vol. i, no. 3, 1904.

of the uterus. He also argues that the anemia of the kidneys, which checks the elimination of water and salts through them, is a very potent factor in causing eclamptic convulsions in many instances. This conception of eclampsia does not however, exclude the action of toxins as a cause.

CHOLINE: A NEW METHOD OF TESTING FOR ITS PRESENCE IN THE BLOOD AND CEREBRO-SPINAL FLUID.

Allen ⁴ has published a new method for the detection of choline which he considers an improvement over the older platino-chloride method.

Ten to 20 cc. of freshly drawn blood are mixed with 4 to 6 times its volume of 96% alcohol, allowed to stand for two hours, filtered, and the filtrate evaporated to dryness at 30° to 40° C. The residue is extracted with 3 cc. of 99.6% absolute alcohol, filtered, and the filtrate again evaporated to dryness. A third extraction with 1.5 cc. absolute alcohol having been made and the filtrate evaporated to dryness as before, 0.8 cc. of distilled water are added, the whole well mixed and transferred to a small dialyzer and dialyzed for twenty-four hours into 4 cc. distilled water. The resulting clear aqueous fluid is then evaporated to dryness in a small porcelain capsule, and to the residue one drop (0.1 cc.) of distilled water is added and shaken round in the capsule. An approximately saturated solution of iodine in 30% alcohol is then carefully added, drop by drop; the addition of 5 to 10 drops of the iodine solution results in the production of a reddish brown precipitate or coloration if choline is present; this color, however, quickly disappears on standing or on the addition of an excess of the test solution.

Reactions were not obtained in the blood of healthy people, but did occur in the blood of cases of general paralysis with convulsions, acute diphtheritic paralysis, cerebral syphilis, and in a case where a number of nerves had been severed high up in the axilla.

THE END-PRODUCTS OF THE SELF-DIGESTION OF ANIMAL ORGANS.

Levene ⁵ has investigated the autolysis of different organs in the hope of throwing some light upon the metabolic processes in life, since he believes that autolysis is similar to the processes going on in metabolism. In this investigation the products of the autolysis of the pancreas and liver were studied. Alanin, aminovalerianic acid, leucine, pyrrolidine carbonic acid, glutaminic acid, phenylalanin, uracil and thymine were obtained from the autolysis of the pancreas. From the liver he obtained glycol, leucine, aminovalerianic acid, alanine, phenylalanine, tyrosine, asparaginic acid, glutaminic acid, thymine, uracil and lycine. For the separation of these bodies, the methods of Fischer were used.

ON THE SELF-DIGESTION OF NUCLEOPROTEIDS.

Jones ⁶ has found that the self-digestion of nucleoproteid of the thymus gland yields xan-

thine, a small amount of hypoxanthine and uracil, but neither guanine, adenine, nor thymine, although the last three are formed by the action of mineral acids upon thymus nucleic acid. Xanthine and a small quantity of hypoxanthine are formed as a result of the self-digestion of suprarenal gland. The spleen when subjected to autolysis yields guanine as well as in the hydrolysis of nucleic acid. On the other hand, hypoxanthine is found in the autolysis while one might expect to find adenine; uracil is formed instead of thymine and cytosine which appear in the hydrolysis of nucleic acid.

THE CHEMISTRY OF BACILLUS COLI COMMUNIS.

Leach ⁷ took pure colon cultures obtained from feces and grew them on agar in a large tank. After seven to fourteen days the growth was removed, freed from agar, extracted first with alcohol and then with ether, dried and pulverized. This material was treated with 1% H₂SO₄ and filtered. The extract was poured into alcohol, and then purified by solution in alcohol. After drying at 100° C. for long periods, a dry powder was obtained which was very hygroscopic. Determinations on the ash showed that 5.3% of the substance was phosphorus. Sulphur was present to the extent of 9.22%. Nitrogen determinations gave 6.49%. This acid cleavage product dissolved in water, giving an opalescent solution acid to litmus. The solution became clear and transparent on the addition of a trace of alkali. It gave a very faint biuret reaction and a good xanthoproteic reaction. In this article the presence of the hexone bases — histidine, arginine, and lysine — in bacterial cells has been indicated. The methods used were modifications of those of Kossel and Kutscher.

EXPERIMENTS ON THE PRECURSORS OF URINARY INDICAN.

The experiments of Underhill ⁸ tend to show that the presence of indican in the urine owes its origin to the activity of bacteria in the intestines. Since tryptophan has been regarded as a precursor of indol, substances containing no tryptophan group, notably gelatine, were fed to dogs for the purpose of determining whether indican would be found increased in the urine. The results show that, under these circumstances, the urine contained a marked decrease of indican.

THE USE OF FORMALDEHYDE AS A PRESERVATIVE IN URINE.

Kenney ⁹ who has conducted a series of experiments on the use of formaldehyde in the urine as a preservative concludes that formaldehyde as an artificial ingredient of the urine is very apt to lead to deceptive results in the analysis of the urine by (1) making the urine appear albuminous when it is free from albumin, and (2) not giving a typical reaction when albumin is present. The so-called "Iatrona test" for albumin by the use

⁴ Journal of Physiology, xxxi, no. 5.

⁵ Ztschr. f. Physiol. Ch., xli, 393-404.

⁶ Ztschr. f. Physiol. Chem., xlii, 35-55.

⁷ J. Am. Med. Assn., April 16, 1904.

⁸ Am. Journal of Physiology, x, 21.

⁹ N. Y. Med. Journ., lxxix, 403-405.

of a solution of formaldehyde should, therefore, never be used. Furthermore, it should be borne in mind that a perfectly normal urine may give a positive reaction for albumin by either the nitric acid test or by the heat and nitric acid test when the urine contains formaldehyde.

THE CEREBRO-SPINAL FLUID IN HYDROCEPHALUS.

Coriat¹⁰ obtained about 1000 cc. of the fluid from a congenital hydrocephalic imbecile and found that it was clear, straw-colored, and did not coagulate spontaneously. It had a faintly acid reaction, sp. gr. 1.012, and contained lutein as the coloring matter. Pyrocatechin, cholesterol and choline were absent, while the presence of fat, urea, serum globulin only, and a reducing substance, probably dextrose, were demonstrated. The inorganic constituents consisted of phosphorus, potassium and sodium; also traces of calcium and magnesium. Iron was absent. The presence of a diastatic ferment was also found.

THE PRODUCTS OF GLYCOLYSIS IN BLOOD AND OTHER ANIMAL FLUIDS.

Austin¹¹ has made a thorough investigation of this subject and his results are interesting. Normal blood of almost all animals when freed fresh from its albumins shows a reducing body which is unquestionably largely made up of dextrose. When, however, the blood is allowed to stand for some time, even when kept free from bacterial decomposition by antiseptics (thymol), this reducing body disappears, and only a substance which is able to hold copper in solution in an alkaline medium is found, but no reduction takes place. The author directed his efforts to finding out what became of the sugar thus destroyed, and to determining whether the products of glycolysis of the blood might be glycuronic acid, saccharic acid, oxalic acid, or carbonic acid. He finds that there is evidence that paired glycuronic acid exists in ox blood and in human serum, but no evidence that dextrose is converted into that substance by any glycolytic ferment existing in the blood. Where this change takes place, if it does, we do not know. He has also demonstrated that the large amount of dextrose failing to reappear in these experiments is not converted into carbonic or oxalic acids.

Reports of Societies.

AMERICAN PEDIATRIC SOCIETY.

SIXTEENTH ANNUAL MEETING AT DETROIT, MICH.,
MAY 30, 31, JUNE 1.

(Continued from No. 19, p. 520.)

SECOND DAY — (Continued.)

EDUCATIONAL FEATURES IN PEDIATRICS.

UNDERGRADUATE teaching might be carried out by means of didactic lectures and bedside instruction; post-graduate teaching should be systematized on a

strictly clinical basis; and physical diagnosis, laboratory work and dietotherapy and hydrotherapy made a prominent feature in the course of pediatrics. In giving clinical instruction in pediatrics, Dr. Caillé during the past fifteen years had adopted the following plan: The first forty minutes of the clinic are devoted to a more or less rapid demonstration of ten or fifteen sick children who were placed on tables accessible to the matriculates, the balance of the hour being taken up by a discussion of the principles of treatment of important groups of disease, or a demonstration given of stomach washing, bowel irrigation, spinal puncture, intubation, tracheotomy and other subjects.

In conclusion, Dr. Caillé thought it would be feasible that the annual transactions should contain a running record of the world's progress in pediatrics by presenting at each meeting a critical review of it during the year under the following headings: (1) Home, School and Hospital Hygiene and Prophylaxis; (2) Teaching Methods in Pediatrics; (3) Diagnosis: Bacteriological, Chemical and Regional; (4) General Therapeutics, including Nutrition, Diet, Hydrotherapy, Phototherapy, Electrotherapy; (5) Surgical Therapeutics; Orthopedics and Mechanotherapy. At each annual meeting the council should designate the members who would be expected to furnish a critical review of progress for the next annual meeting, thus giving them a year's time in which to collect material.

ANALYSIS OF ONE HUNDRED AND EIGHTEEN CASES OF LOBAR PNEUMONIA IN INFANCY.

DR. J. L. MORSE, Boston, read this paper and gave the following summary: Lobar pneumonia is more common and occurs relatively more frequently in comparison with broncho-pneumonia in infancy than is generally supposed. The analysis of these cases shows the following points: The onset was less stormy than is generally supposed. It was often ushered in by vomiting, but rarely by a convulsion. It usually began with fever and cough, which were often accompanied by apathy or drowsiness. Movement of the *alæ nasi* was not a constant symptom. A whole lobe was more often involved than a part. The left lower lobe was the one most frequently involved. The right upper and right lower lobe came next in frequency. The portion of the lungs involved was relatively the same in the fatal cases as in those which recovered. As a rule, the area involved was larger in the fatal cases. The average duration of the fever in the cases that recovered was about eight days, being nearly the same in both years. The course was more often short in the first year, however, than in the second. The average duration of the fever in the uncomplicated cases that were fatal was 12.8 days; that is, the duration of the fever was longer in the fatal cases than in those that recovered. The highest temperature was usually between 103 F. and 106 F., the number of cases being nearly the same for each degree. The temperature fell by crisis in 68.8%. Crisis was less common in the first than in the second year. Collapse during the crisis was very unusual. Pseudo-crises were not very common, but irregularities and remissions in the temperature were not at all unusual. The mortality was lowest when the temperature did not rise above 103 F., and highest in those cases in which it went over 106 F. The degree of fever between 103 F. and 106 F. had no apparent effect on the mortality. A high temperature was no more fatal in the second year than in the first year. The usual pulse rate was between 150 and 170. No case died in which the pulse was not over 140. The rate of the pulse, when it was above 140, had little or no apparent effect on the mortality. The usual respiratory rate was between 55

¹⁰ Am. Journ. Physiology, x, 111-115.

¹¹ Am. Journ. of Med. Sciences, May, 1904.