

The danger of a calculus formation always attends the separation of cystin from the urine inside the body. Where a concretion exists, it is usual to find few (sometimes many) isolated crystals of cystin.

Cystin calculi vary in size from microscopic concretions to large calculi, and may, by their irritation, produce a mild or severe inflammatory process in that part of the urinary tract in which they are deposited. They usually have a grayish color at the time of their removal from the body, but very soon undergo a change of color, becoming greenish, due to the exposure to air and light (oxidation).

When a urine containing cystin decomposes, its decomposition is attended with the evolution of H_2S , for the reason that the cystin contains 26 per cent. of sulphur.

Its amount in the urine undergoes considerable variation at different times, and it may temporarily disappear. The daily quantity may reach as high as one and one-half grammes (Toel). Ordinarily, however, the quantity does not go so high, but varies between a few milligrammes and one gramme.

Cause of Cystinuria.— Previous to 1888–89 it was thought to be due to abnormal processes of oxidation in the liver, since, in some respects, cystin resembled *taurin*. Marowski² considered it a vicarious elimination of *taurin* because in his case there was an absence of bile in the intestine.

The experiments of Baumann and v. Udránszky, Brieger, and others threw new light on the causation of this condition. They found that certain products of intestinal putrefaction, called *diamines*, were eliminated in the urine and feces of persons afflicted with cystinuria. Baumann and v. Udránszky³ made frequent examinations of the urine of a case of cystinuria for diamines and found them regularly. They were isolated in the form of a benzoyl compound, which varied in amount from 0.2 to 0.4 gm. in twenty-four hours. Approximately one-third to one-fourth of these substances existed as Tetramethyldiamine, and the remainder as Pentamethyldiamine.⁴

According to Brieger, since these diamines arise only as the result of putrefactive processes due to specific bacteria, cystinuria can be considered the result of a specific infection of the intestine.

In Baumann's case (mentioned above) both diamines were invariably found in the feces as well as in the urine, and he observed that the relative amounts of these substances in the feces, particularly the cadaverin, varied inversely as those in the urine. Neither Brieger nor Baumann were able to discover these diamines in the feces of healthy individuals, or in those suffering from other diseases.⁵

So far as has yet been determined, no definite relation exists between the formation of cystin and the diamines, although the same conditions which produce diaminuria usually also produce cystinuria.

Hereditary predisposition certainly appears to have some bearing as a cause, since so many cases have been reported of the existence of the affection in several members of the same family. It is difficult, however, to explain the hereditary transmission of cystinuria by the theory of Brieger, unless we assume that such in-

dividuals are more susceptible to the action of the "specific bacteria," which produce the intestinal putrefaction, than others.

Cystin is met with in the urine of both infants and adults, but only rarely occurs in old age. It does not appear to be connected with any local or constitutional disease. It may be present and continue for years without any noticeable impairment of health, although there is usually more or less irritation of the urinary tract, as a result of its separation from the urine.

The evolution of H_2S gas from the urine should always lead to its examination for cystin, although H_2S is not always due to the presence of cystin. Oftentimes silver coins carried in the pockets of patients having cystinuria are blackened by the sulphuretted hydrogen evolved. (Cystin is sometimes eliminated by the sweat, hence the H_2S .)

It is important to distinguish between the crystals of cystin and other like crystalline elements. It can be distinguished from the pale six-sided crystals of uric acid by allowing a drop of weak ammoniac hydrate to mingle with the deposit on a glass slide, when either form of crystals disappears, evaporate, and if cystin be present the crystals reappear; if uric acid, crystals of ammonium urate will be found, instead of those of uric acid. Another simple method consists in treating the crystals with hydrochloric acid, which readily dissolves the cystin, but leaves uric acid unchanged. From triple-phosphate, it is distinguished by its behavior with acetic acid, which readily dissolves the phosphate crystals, while cystin remains unchanged.

Our case represents the importance of the chemical examination of all calculi, both from a diagnostic and prognostic point of view. A person who has once had a cystin calculus is very likely to have another, the liability, perhaps, being greater than when formed of the other crystalline elements, since, so far as I have been able to learn, no satisfactory treatment has yet been instituted for the relief of cystinuria.

TWO CASES OF SPONTANEOUS RUPTURE OF THE UTERUS DURING LABOR.

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DURING a practice of over twenty-five years I have attended upwards of three thousand confinements. It has been my lot to see about every anomaly and complication mentioned in the text-books. I have lately had a case of spontaneous rupture of the uterus, in a healthy woman, during labor at full term. Both mother and child died. This is the second case in my lifetime. The following are the notes of these cases:

CASE I. Mrs. M., aged thirty years, a large, fat woman, weighing 180 pounds. Had had several children, with tedious labors. Was called to attend her in confinement, November 18, 1872. Found her at 7.30 p. m., in hard labor, with head high up and not yet engaged in pelvis. Liquor amnii had escaped several hours before. The uterine contractions were so strong, with no advance of head, that I advised ether and forceps delivery. I could not obtain the consent of the family till 10.30 p. m. at which time the patient went into a collapse, Dr. Montgomery assisted me in giving ether and applying the forceps. A dead child was delivered and the placenta removed. I examined and found a large rent in the body of the

² Deutsches Archiv. f. klin. Med., iv, p. 449.

³ Ztschr. f. Physiol. Chem., 1889, xiii, p. 562.

⁴ Brieger gave new names to these two substances, calling the first *putrescin* and the latter *cadaverin*.

⁵ According to Noubauer and Vogel these diamines have been found in the intestinal discharges of patients with Asiatic Cholera. Analyse des Harns, Ninth Edition, 1890, p. 87.

uterus extending transversely about half the circumference of the uterus, the lower segment including the lower third of the body. The weight of the child was fifteen pounds. Death of the mother followed immediately on delivery.

CASE II. Was called, February 17, 1898, at 9.30 P. M., to attend Mrs. M. T., in her fifth confinement. Previous confinements had been normal. Nothing in the condition of the patient on this occasion to warrant any apprehension. She was a strong, healthy woman, having up to the time of labor setting in done her own housework. Shortly after my arrival the bag of waters broke; amount large. Head not yet engaged at brim; R. O. P. Expulsive pains came on, and head advanced rapidly. At 10.30 P. M. the head was distending perineum; occiput had passed under pubic arch; and I expected immediate termination of the labor, when all pains suddenly ceased and the patient went into a collapse. The head receded to brim of pelvis and the body of the child could be felt under the abdominal wall, I summoned assistance, and in a few minutes Dr. C. C. Day arrived. Ether was cautiously given and forceps applied. The head was easily delivered, but the extraction of the shoulders gave me considerable difficulty; all of the child had, in fact, escaped from the uterus except the head, and it required no little tact to disengage the shoulders and press them into the hollow of the sacrum while my assistant made traction downwards by means of a fillet around the child's neck.

I made an examination, and found a transverse rent extending about two-thirds of the circumference of the uterus, the posterior wall being intact, and the lower segment, including about the lower fourth of the body of the uterus. The placenta was easily separated and delivered; it was attached to the upper posterior portion. When I removed the placenta, some coils of small intestine came down through the laceration in the uterine wall into the vagina. The patient continued in the collapse, and died immediately after delivery.

I am unable to assign any cause for the untoward accident that brought about death in both the above cases. Both women were young—one of fair, the other of more than average vigor; and no ergot or other medicine provocative of uterine contractions was used.

Medical Progress.

PROGRESS IN PUBLIC HYGIENE.

BY S. W. ABBOTT, M.D.

CONVEYANCE OF INFECTIOUS DISEASES BY MEANS OF THE AIR.

DR. E. GERMANO¹ reports the results of a series of experiments in continuance of those already reported. The later series relate to diphtheria, erysipelas and pneumonia. He reports the following conclusions in regard to the spread of diphtheria:

(1) The diphtheria bacillus can resist drying for a long time, both in the membrane, in the tissues and when present in dust.

(2) Increased rapidity in drying, even by means of sulphuric acid, does not affect the resisting power of the bacilli either in the tissues or in the dust.

(3) The bacillus survives better the more it is surrounded by dust, probably on account of its greater protection from oxidation.

(4) When dried completely, the bacillus retains its virulence until it dies.

(5) The air can carry diphtheria while living, by means of dust.

With reference to streptococci, he says:

(1) The power of surviving the drying process depends largely on the mode in which this is carried out, and the material with which it is mixed.

(2) At any rate, its power of resistance is great and can continue for months.

(3) The rapidity of drying has no effect on the vitality of the streptococci.

(4) The resisting power increases with the amount of material in which it is implanted, and which protects it from the air.

With reference to the streptococcus pneumoniae, to which he attributes pneumonia and sometimes meningitis, pleurisy and acute nephritis, he concludes:

(1) The diplococcus is a micro-organism which can resist drying for a long time.

(2) It survives better when dried than when moist.

(3) As it can under some conditions exist in a dry condition for a long time, but not to the same extent as the *streptococcus erysipelatosus*, the possibility of its conveyance through the air is established.

THE SPREAD OF INFECTIOUS DISEASES BY MEANS OF BATHS AND SUMMER RESORTS.²

The following propositions are laid down by Dr. Battlehner, of Karlsruhe, at the close of a discussion by the German Society of Public Health, with reference to public resorts, camp-grounds and places where people congregate in large numbers:

(1) It is quite possible that summer visitors may carry and spread infectious diseases at bathing-places and summer resorts.

(2) In such places care should be taken to secure a good water-supply. The buildings should be provided with good sanitary arrangements. The streets should receive especial care, the sweepings should be regularly collected and taken care of, and the foul water and surface drainage should receive attention.

(3) Where bathing tanks are in use, the water should be frequently renewed and examined.

(4) Sanitary police regulations should be enforced as in other places.

(5) Notification of infectious diseases should be required of all physicians as a means of preventing their spread.

(6) Disinfecting apparatus and well-instructed attendants should be provided.

(7) If there is no hospital a separate room should be provided for persons ill with infectious diseases.

(8) There should also be a house for the reception of dead bodies.

THE CONTAGION OF SPORADIC DYSENTERY.

During the past fifty years dysentery has gradually diminished in its destructiveness throughout New England and the severe epidemics of the period from 1840 to 1870 have been followed by a similar period of comparative immunity from the disease.

In 1849, an epidemic year, dysentery attained the very high death-rate of 25.4 per 10,000 of the living

¹ Zeitschr. f. Hygiene, vol. xxv, No. 3, and xxvi, No. 1.

² Vierteljahrsschrift f. öff. Gesundheitspflege, 1898, vol. xxx, p. 22.