distinct—one produced by the left, the other by the right ventricle. Well recognised differences in character between them are recognised. How does Dr. Leared explain these, if the sounds be the product of collision of the blood, and not of tension of the ventricular walls and valves?

4. The first sound undergoes remarkable modifications—(a) in dilatation of the ventricles; still more (b) in stenosis of the mitral orifice. It is not weaker, and is indeed often louder, than usual; but it is short and sharp, like the second sound. This is easily explained in the case of dilatation, if the ventricular walls and valves are supposed to be the origin of the sound. An explanation on the hypothesis of collision of moving ventricular and standing aortic blood is requested.

5. In dilatation of the ascending aorta, and in aneurism, the aortic second sound is not only louder than in the normal state, but greatly changed in tone. The increased and modified resonance is easily understood, and is, indeed, strikingly suggestive of the change in the walls of the vessel, if the sound result from the tension and vibration of the enlarged area of resonant membrane, but could scarcely be the effect of increase in the size of the column of blood.

NOTES OF A CASE OF CYSTINE CALCULUS DIAGNOSED BEFORE OPERATION.

By F. A. SOUTHAM, B.A.Oxon, M.R.C.S.,
Physician's Assistant, Manchester Royal Infirmary.

THE rare occurrence of cystine calculi, and the few recorded instances of any examination of urine containing these calculi, followed by operation for their removal, have induced me to publish the following notes of a case which came under the care of my father, the late Mr. George Southam.

T. M., a parish sexton, aged 57, married, consulted my father in May 1874, suffering from the usual symptoms of calculus vesicæ. On sounding the bladder, a stone was readily detected; and, on my father's recommendation, he entered the Manchester Royal Infirmary in the following month to undergo an operation for its removal, as he was anxious to obtain relief from the symptoms from which he was then suffering.

Previous History.—The patient was a robust healthy-looking man, and, though in his occupation as sexton he had been exposed to damp and all kinds of weather, he had enjoyed good health all his life, except that, on four different occasions (the first occurring when he was twenty years of age), he has been laid up for a few weeks at a time with attacks of inflammation of the kidneys. On the last occasion, about Christmas 1872, he was confined to bed for nearly six weeks. From this attack he completely recovered, and was quite well up to the following July, when he began to be troubled with a feeling of irritation about the bladder. He consulted a medical man, who examined his urine, but found nothing abnormal. He was told that he was suffering from "liver-complaint", and was treated for some derangement of that organ.

During the following winter, he suffered considerably from symptoms referable to the bladder, and, in the spring of 1874, these increased in severity, becoming so well marked, that he himself became convinced that a calculus was present. He, however, was able to follow his occupation as usual all through the winter, working up to the day of his admission into the hospital. He had never noticed the presence of gravel, or anything abnormal about his urine, except that, during the last few months, blood had been frequently present, especially after much exertion. During the last few winters, he had suffered slightly from bronchitis. He had had six children, three of whom are now alive and healthy, the eldest twenty-six, the youngest ten years of age. One daughter, since dead, when fourteen months old, suffered from an attack of inflammation of the bladder, and passed gravel in the urine for some time. He had one brother and several sisters here all alive and healthy. No other member of his family had ever suffered from calculus, or, as far as he was aware, from any affection of the urinary organs. He was accordingly admitted into the hospital as an in-patient, under my father, on June 15th; and, on examination a few days later, the calculus was again distinctly felt. On this occasion, a lithotrite was used. The diameter of the stone was made out to be a little over one inch. From the dull sound obtained on striking it, it was evident that it was of a soft nature externally; but no suspicion as to its real structure was entertained until a few days later, when, on examination of the urine, I found that it presented the following characteristics. It was of specific gravity 1020, of a pale amber colour, with peculiar aromatic odour; acid; it deposited a whitish sediment

after standing a short time. On heating and on addition of nitric acid, a small quantity of albumen was found to be present. Microscopical examination revealed the presence of numerous crystals mixed with pus-cells and a few red blood-cells; no casts. The crystals were in the form of colourless transparent hexagonal plates, varying in size and thickness; in some cases, forming perfect hexagons; in other cases, having their sides and angles unequal. Mixed with these were a very few prismatic crystals. The hexagonal form of these crystals was characterised by cystine; but, as uric acid is occasionally deposited in the shape of six-sided plates, the following chemical tests were employed to render the diagnosis certain. 1. On the addition of strong nitric or hydrochloric acid, the crystals all disappeared; 2. On the addition of acetic acid, no change took place, except that, after standing some time, the crystals appeared to be more numerous; 3. On the addition of a little nitric acid to some urine in a watch-glass, and allowing it to stand for twelve hours, the hexagonal crystals all disappeared, while numerous crystals of uric acid were present in the form of lozenges, and rhombic tablets of a brownish-yellow colour; 4. On the addition of liquor ammoniæ, the crystals all readily disappeared. Upon spontaneous evaporation of the ammoniacal solution, the cystine again appeared in its original form of six-sided plates. 5. On heating a little urine with liquor potassæ and lead oxide, a dark-coloured precipitate of lead sulphide was formed. This reaction was characteristic of cystine, as indicating the presence of sulphur; but it was here probably also in part due to the sulphur contained in the albumen, which was present in small quantity in the urine. 6. The transparency, absence of colour, and constant shape of the crystals, were also characteristic points as distinguishing from uric acid. 7. After standing forty-eight hours, the urine became quite neutral, with a strong disagreeable odour, and contained numerous crystals of triple phosphate and phosphate of lime. The cystine had almost all disappeared, a few perfect crystals, however, being still present, while others were seen to be gradually dissolving, becoming irregular in shape, with serrated margins. A few hours later, the crystals had all entirely disappeared, and addition of acetic acid was not followed by their reappearance. The examination of the urine, both chemical and microscopical, clearly indicated the presence of a cystine calculus; and, as the bladder was apparently healthy and capable of retaining a considerable quantity of urine, the stone of moderate dimensions, and, being cystine, consequently of soft consistence, the patient strong and of sound constitution, the case was considered one favourable for the performance of lithotripsy.

July 14th. Lithotripsy was performed, the patient having been put under the influence of chloroform. The stone was readily seized, and very little force was required to crush it, showing it to be of soft consistence. This having been repeated three times, the bladder was washed out with a Clover's bottle, several small pieces of calculus coming away at the same time and being caught in the glass receiver. These consisted of a soft yellow waxy-looking substance, having all the appearance of cystine. Microscopical examination showed the presence of the characteristic hexagonal crystals, and thus the diagnosis previously made as to the character of the calculus was at once confirmed. The operation was followed by slight irritability of the bladder, micturition being rendered more frequent and attended with some pain. The urine contained a quantity of detritus, pus, and mucus, but very little blood, and, on the following day, it had become alkaline, with an ammoniacal odour.

July 17th. The patient was a little feverish and perspiring a good deal; suffering from bronchitis, with a feeling of oppression about the chest; cough troublesome and accompanied with a considerable quantity of thick tenacious expectoration. Micturition was still painful, and he complained of pain over the region of the bladder, which was washed out daily.

July 21st. He was better as regarded the bronchitis and cough, expectoration being diminished. There was less irritability about the bladder.

July 24th. Lithotripsy was performed again to-day for the second time. Four pieces of calculus were successively seized and crushed.

July 26th. The second crushing had been followed by considerable relief, the irritation and pain about the bladder being much diminished. It was noticed that his breath had a sweetish odour, like that often present in diabetes; and, on examination of the urine, it was found to contain a slight trace of sugar; the specific gravity was 1012. It was strongly alkaline, with ammoniacal odour; it contained a small quantity of albumen, numerous crystals of triple phosphate, pus-cells, and a few blood-corpuscles. No cystine or casts were present.

July 29th. The bladder was washed out again to-day, a considerable quantity of detritus coming away. He felt much easier since the

second operation. The cough was very troublesome again, with considerable expectoration. The urine presented the same condition as before, and the addition of acetic acid did not show the presence of cystine. The saliva, sputa, and sweat were examined for cystine, in each case by adding acetic acid, but no evidence of its presence could be found.

August 1st. From this date, the bronchitic symptoms gradually increased in severity, becoming of a more acute character and attended with a sense of great weakness. Along with these symptoms, there was no increased irritability or pain about the bladder. Signs of adynamia and deficient aëration of the blood set in, followed by coma, and the patient, gradually sinking, died on August 8th.

Post Mortem Examination.—Both lungs were much congested; the bronchi were dilated and filled with mucus. On the left side, there were some old pleuritic adhesions. The aortic valves allowed regurgitation, and had calcareous plates at their bases; the other valves were healthy. The kidneys were surrounded by a large quantity of fat, which was abnormally adherent to their capsules; both contained numerous abscesses, the lining membrane of the pelvis being, too, inflamed and suppurating. The capsules were thickened and adherent. The ureters were thickened and dilated. The bladder was thickened and fasciculated.

Nature of Calculus.—The fragments passed with the urine during life consisted of yellow waxy-looking particles, varying in size (the largest being about the size of a pea), readily breaking down and crumbling on slight pressure. The weight was seventy-seven grains. The fragments removed from the bladder after death were six in number; the largest portion was a little over one inch in length and about three-fourths of an inch in thickness; the other particles varying in size. Their external surface was rounded, but rough and somewhat tuberculated, of a dull yellow colour, and glistening in places as though studded with minute crystals. The fractured surface of the fragments showed a radiated structure, somewhat transparent, crystalline, and glistening. There was no trace of any nucleus or development of concentric layers, the structure being perfectly homogeneous throughout. On scraping with a knife, it readily crumbled, forming a white powder.

Though two years have elapsed since the removal of the calculus, none of the particles show the pale green colour which is commonly described as appearing after a time. If a small portion be treated with liquor ammoniæ, it readily dissolves, and, on evaporation, the characteristic six-sided crystals are deposited. The weight of the fragments was one hundred and eighteen grains. The total weight of the calculus was, therefore, one hundred and ninety-five grains, and it appears to have been egg-shaped and in size about one inch by one inch and a quarter.

REMARKS.—It is strange that, with such extensive organic disease of the kidneys, evidently of long standing, so little evidence was present during life; for the amount of irritability about the bladder and the quantity of pus and albumen present in the urine were no greater than the presence of the stone would explain. The condition of the bladder and kidneys, as revealed after death, were certainly not favourable for the performance of lithotripsy, as the introduction of instruments and the presence of the fragments of calculi would be calculated to increase the mischief in these organs. The slight amount of irritation excited by the operation may, perhaps, be accounted for by the soft and light character of the calculus and the absence of any sharp angles or spicula in the broken fragments. The condition of the kidneys that existed has probably no special relation to the presence of cystine in the system, although it is notable that, in a case of Mr. Luke of the London Hospital, extensive disorganisation of the kidneys was found associated with a cystine calculus.

Of the pathological conditions of the system which give rise to the formation of cystine, very little is known; Dr. Golding Bird believes that there is strong evidence of its connection with the scrofulous diathesis; but, in the present case, there was not the slightest evidence of such a condition either in the deceased himself or in any member of his family. The close resemblance in chemical composition between cystine and taurine, both substances containing about 26 per cent. of sulphur, suggest that the liver is the seat of its formation; and Scherer has, in fact, demonstrated its presence in this organ; while taurine has also been detected in the urine. It is, perhaps, worthy of notice that, in this case, before there was any evidence of the existence of a calculus, deceased was treated by the medical man whom he consulted for some hepatic derangement. In the majority of cases where cystine has been found in the urine, the general health and nutrition of the patient have been bad; but, up to the last, deceased was robust and well nourished, following the duties of his laborious occupation with more than ordinary energy up to his admission into the hospital. One of the most interesting circumstances in the history of cystine is its

hereditary character and its tendency to be present in several members of the same family. Out of twenty-two cases collected by Poland, ten occurred in four families. Mr. T. Pridgin Teale has described its presence in three members of the same family, and Dr. G. Bird has recorded a case where it was found in three successive generations. I have lately examined the urine of the three surviving children and also of a brother of deceased, in each case adding acetic acid and allowing the urine to stand for twenty-four hours, but in no instance have I been able to detect any evidence of the presence of cystine. In one instance (viz., in the brother of deceased), the urine was of low specific gravity, neutral, pale amber colour, peculiar odour, depositing a whitish sediment of mucus and triple phosphates, and readily decomposing. Microscopical examination did not, however, show the presence of any hexagonal crystals, and in no case was the addition of acetic acid followed by their precipitation, its action being simply to cause a copious deposit of crystals of uric acid.

A COLD AND ITS CURE.

By W. J. HARAM WOOD, L.R.C.P.ED.

It was with great pleasure that I read an article in the JOURNAL of December 9th headed "A Cold and its Cure", by Dr. Jukes Styrap, as I have a personal and peculiar interest in this subject, having been considerably plagued—and that frequently—with coryza. The antimony and morphia treatment was not unknown to me; it is clearly laid down in Sir T. Watson's *Lectures*, and is undoubtedly very good—perhaps the best that can be followed when dealing with private patients, who can be nursed in the house if necessary. I have several times tried it myself—certainly with some relief; but I cannot say that I have found it to shorten or cure the attack, though I am far from denying that it may do so in many individuals. It is, however, a method peculiarly unfitted for medical men and others who cannot remain indoors for a few days, and perhaps would not if they could; and its chief weakness is shown in Dr. Styrap's words, "Confinement to the house for a day or two should be insisted on whenever practicable". Exposed as we are to night-work and sudden changes of temperature, it will not do to be sipping morphia and antimony. What we really require is a method of cure sure and speedy, during which our usual daily work and exposure can be gone through without incurring fresh danger; and such a desideratum has certainly been described by Dr. C. J. B. Williams. It may be widely known, but I fear it is not so extensively appreciated and practised as it deserves. It has been called the *dry plan*, and consists simply in abstinence from drink of any kind until a cure is effected. The theory upon which it is based cannot be better expressed than in the words of Sir T. Watson. "The principle here concerned is that of cutting off the supply of watery materials to the blood. The wants of the system exhaust from the circulating fluid all that can be spared for the sustentation of the tissues, or for the natural evacuations, and there is nothing left to feed the unnatural secretion from the inflamed mucous membrane. Its capillary vessels cease to be congested; the morbid flux is diverted, and the inflammation starved away."

For several years I have made personal trial of this method, and have the highest opinion of its efficacy. The only drawback is the great thirst, which is at times distressing; but this is felt more, I believe, during the first twenty-four hours than subsequently, when one seems to become accustomed to it; and really it is as nothing, compared with the advantages of a diminishing defluxion, a freedom to follow one's occupation, and a certainty (I believe) of cure. But the chief advantage of the *dry method* has yet to be stated, and that is, it almost never leaves even a trace of bronchial irritation or cough of any kind; and I think this result is rarely attained by any other plan, especially where there is a tendency to anything of the sort.

Good as the method is, I think it may be made more complete and satisfactory by observing the following simple directions.

1. Begin with a sharp aperient in the solid form of pills, swallowing them with as little water as possible.
2. The food should be rather less in quantity and more digestible than usual, and at first should be dry; later on, the moister forms of food are more easily swallowed and digested.
3. As much exercise as possible should be taken in warm clothing, to promote the action of skin and bowels.

The thirst often keeps one awake at night; but this may be prevented by taking a small opiate or fifteen minims of chlorodyne, if necessary; and it is probable that the cold is also benefited by such a dose, but with this difference, that, when the dry treatment has been carried so far as to produce great thirst, it is almost certain that opium will not