disintegration of the peripheric surface. A good example of this may be found in the treatise on *Maladies Génito-Urinaires*, by Dr. Leroy d'Etiolles (Paris, 1855), which contains numerous engravings and simplifies the study of spontaneous fragmentation. The author, however, seems to prefer the explanation of the retraction of the nucleus, which in these stones is generally composed of uric acid, has a dense structure and is no longer saturated with urine.

I own to not well understanding what my regretted *confrère* meant by this, and I will not insist on the theory of exfoliation as an explanation of fragmentation, for during the last twenty-eight years I have never observed a case where exfoliation could have been said to have been the cause of fragmentation.

Now, the theory of the bursting of the nucleus is quite a different matter, and it is the most likely explanation of the numerous examples which I have collected at Contrexéville, and of those which I have been able to see in the museums of Paris (Hôpital Necker), London (College of Surgeons), New York, Boston, and St. Petersburg.

It is, moreover, the theory to which Dr. Ord gives preference.¹ Instead of believing with Dr. Leroy d'Etiolles in a contraction, Dr. Ord admits an expansion of the nucleus, which causes an explosion of the peripheric surface. Unfortunately chemistry has not been able, in this as well as in many other cases, to furnish us with the key to the problem, "Why certain calculi composed of uric acid and urates burst, while others do not?" It is not due to the age of the patient, for Olaus Borrichius related in 1671 the case of a child of 6 who passed fragments of stone broken in the bladder. On the other hand, I have at the present time an old patient of 84 years of age, who passed some fragments at Contrexéville, but who refuses on account of his age, and because he is free from suffering, to allow those which the bladder cannot expel to be broken up. Neither is it the number of calculi, for I saw a patient at Contrexéville, in 1875, who was sent to me by Dr. Durand Fardel, of Vichy, and whose case I related at the Academy of Medicine in Paris in 1876. This patient passed at Contrexéville the nucleus of a solitary calculus, spontaneously fractured.

I had already published in 1869 a similar case of a solitary calculus of small dimension, and of which all the fragments could have been expelled at Contrexéville. But in the great majority of cases these calculi are numerous, and one of the most typical specimens that one can see in the Museum of Professor Guyon, at the Hôpital Necker in Paris.

Here the bladder is three-quarters filled with these calculi, of which the largest has not the dimension of a hazel nut, and which are all more or less fragmented.

I can also quote the case of another old man, aged 76 years, presenting all the symptoms of stone, but who energetically refused all exploration. He took a cure at Contrexéville, consuming, however, a very small quantity of water, and passed fragments numerous enough to fill the two hands joined. After this he came to Contrexéville for eight successive years without suffering or expelling any more fragments.

Generally speaking, in cases of these numerous calculi composed always of uric acid and urates, the fragments are only of the thickness of an eggshell, and the nuclei are

Fig. 2.—Calculi broken in the bladder.

cleanly broken. But in some more rare cases, as, for instance, in that related in the following (Fig. 2), certain fragments adhere to the nucleus.

A man, aged 62 years, came to Contrexéville in 1892 who had had several attacks of renal colic, though he did not present any symptoms of vesical calculus. This decided me to order him the use of the waters. During his cure he expelled the two nuclei represented in Fig. 2. The expulsion continued for a fortnight after his cure, which he renewed in 1893. This time, however, he did not expel anything but red sand.

I am far from stating that the waters of Contrexéville produced the rupture of these calculi. They were of a size to pass by the natural channels. All I can affirm is that the waters in stimulating the contractibility of the bladder forced their expulsion.

In conclusion, I would say: "Do not be too exclusive in the explanation of spontaneous fragmentation of stones in the bladder." I think I have shown that, according to some cases, the theories of Drs. Civiale and Ord may be correct.

TWO CASES OF HEART DISEASE TREATED BY SALINE BATHS.

By G. V. POORE, M.D., F.R.C.P.,
Physician to University College Hospital.

APPROPOS of the discussion which lately took place in the BRITISH MEDICAL JOURNAL as to the effect produced by saline baths on patients with heart disease, the following brief recital of two cases may prove of interest. The point to which attention has been mainly directed is the effect of the baths upon the area of cardiac dullness.

The baths used contained 4 lbs. of sodium chloride and 6 ozs. of calcium chloride to 40 gallons of water. The temperature of the baths was 95° F., and the time of immersion was in every instance limited to eight minutes.

CASE 1.—H. S., aged 33, employed on the Midland Railway, was admitted on November 28th, 1895, suffering from double aortic disease. The heart was greatly enlarged, and the patient was liable to severe anginal attacks. He had been in University College Hospital on two previous occasions, and after a sojourn of some weeks on each occasion, had left considerably improved.

It is needless to go into details, and it will suffice to say that all the signs of aortic disease (obstructive and regurgitant) were present in a marked degree, and that the murmurs were, perhaps, exceptionally loud.

The cardiac dullness was limited by the upper border of the fourth rib, the mid-sternal line, and a line extending obliquely from the upper limit to a point three inches outside the left nipple. The "apex beat" could be felt in the sixth interspace, 3 inches outside the left nipple.

The patient was admitted on November 28th, and the first bath was administered on November 30th, but as the patient was seized with anginal pain the bath was discontinued after a minute or so. This first attempt led me to think that the patient was too ill to continue with the treatment, but as he volunteered the statement on the following day that he "had felt better after the bath, which seemed to do him good," it was resolved to continue.

On December 2nd the bath was brought to the bedside, and the patient, without the fatigue of walking to the bath-room, stepped leisurely and quietly out of his bed and into his bath. This bath was borne well, and between this date and January 3rd the patient had twelve baths, and careful observations and measurements were made immediately before and immediately after each bath.

When the patient got into the bath and assumed a more recumbent position than he had previously maintained, the apex beat on two occasions was observed to move directly upwards into the fifth space, but on sitting upright it moved back again into the sixth space. Beyond this no alteration of the position of the apex beat took place. Immediately after every bath the apex beat was precisely in the same position as it was before the bath, and when he left the hospital the apex beat was in exactly the same position as it occupied on his admission.

The area of cardiac dullness was invariably diminished after the bath, and both the transverse and vertical measurements were proportionately decreased. The appreciation of dif-

¹ Path. Soc. Trans., vo. xxviii, et. seq.

ferences in percussion sounds and the inherent difficulties of taking exact measurements, doubtless afford scope for considerable error, but as these examinations were repeated on many occasions, this error will be minimised by taking the average of many examinations.

The diminution of the cardiac dulness immediately after the bath averaged 1 inch transversely and $\frac{1}{2}$ inch vertically, and on no single occasion did we fail to note a diminution in both directions. On one occasion (December 23rd) the diminution of transverse measurement amounted to $2\frac{1}{2}$ inches, while on December 15th only $\frac{1}{4}$ inch of diminution was noted, the average of 11 measurements amounting, as has been said, to 1 inch. Moreover this transverse measurement tended steadily to diminish from the first. Thus on the 11 occasions between December 10th and January 3rd the measurements were (in inches):

Before bath	...	8 $\frac{1}{2}$	8 $\frac{1}{2}$	7	6 $\frac{1}{2}$	7	7 $\frac{1}{2}$	6 $\frac{1}{2}$	4 $\frac{1}{2}$	6 $\frac{1}{2}$	5 $\frac{1}{2}$	4 $\frac{1}{2}$
After bath	...	8 $\frac{1}{2}$	8 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	5 $\frac{1}{2}$	6 $\frac{1}{2}$	4	3	5 $\frac{1}{2}$	4 $\frac{1}{2}$	3 $\frac{1}{2}$

There was no permanent alterations in the upper level of cardiac dulness, only a transient diminution after each bath.

Chest measurements were also taken before and after the baths. Thus the circumference of the chest was taken on twelve occasions; (a) at the upper border of the fourth rib; and (b) at the upper level of the hepatic dulness. Both these measurements were slightly decreased after the bath on eleven occasions. Measurement a (at upper border of fourth rib) gave an average diminution of slightly more than 1 inch, and measurement b (at upper border of liver dulness) gave an average diminution of $\frac{3}{4}$ inch.

The antero-posterior diameter of the chest, from the second rib in front to a corresponding point behind, were taken with calipers on both the right and left side on six occasions, and it was found that there was an average increase on both sides of $\frac{1}{4}$ inch.

On two occasions it was noted that the upper level of the liver dulness had slightly descended after the bath. On one occasion this amounted to $\frac{1}{4}$ inch, and on another occasion to $\frac{3}{4}$ inch, but this fact was not so systematically noted as the others which have been dealt with. There was no permanent change in any of the chest measurements. On no occasion was any difference in the cardiac sounds noted as a result of the bath. The character of the murmurs remained unchanged.

The patient's condition improved, and on January 22nd, after fifty-five days in hospital, he felt well enough to ask for his discharge. The improvement has taken place on two previous occasions, and whether that which took place on the present occasion is to be attributed to the bathing or the rest in bed, or both, is necessarily a matter of doubt.

CASE II.—R. D., a coach painter, aged 26, admitted on December 21st with all the signs of double aortic disease (obstructive and regurgitant). The upper level of cardiac dulness was at the lower border of the third rib, and the transverse dulness extended from the left border of the sternum to $1\frac{1}{2}$ inch outside nipple. The apex beat was in the sixth interspace, just outside the nipple line. This patient had four baths only, and on every occasion the cardiac dulness was diminished both transversely and vertically after the bath, the averages being $\frac{3}{4}$ inch transversely and $\frac{1}{2}$ inch vertically. The apex beat moved about $\frac{1}{4}$ inch inwards after every bath except one, but its position when the patient left the hospital had undergone no permanent change. The bath usually caused a considerable eructation of flatus from the stomach.

Chest measurements were also taken, but the variations in the measurements were so slight that the result of them may be regarded as negative.

I am much indebted to my house-physician Mr. Bates, and to Mr. Ernest Stock, the clinical clerk who had charge of the patient, for the care with which they assisted in making the observations detailed above.

THE Ohio State Legislature has passed a Bill which provides for the execution of criminals by electricity instead of by hanging. The law will come into force on July 1st.

PRESENTATION.—Dr. H. Rogers-Tillstone, of Clevedon, has been presented with a black marble clock by his (female) ambulance and nursing classes, in token of their esteem.

AUSCULTATORY PERCUSSION: A REPLY.

By W. BEZLY THORNE, M.D.

I NEITHER expected nor desired that the paper which I read before the British Medical Association on the subject of Auscultatory Percussion would be allowed to pass without criticism. Allow me, at the outset, to point out that I carefully avoided connecting the name of Dr. Schott with that method of physical examination. He has long practised percussion in a manner, devised by himself and his brother, for which he claims special advantages.

The auscultatory method of percussion was first introduced to my notice by Dr. P. Watson Williams, of Clifton, in the autumn of 1894, as one which "would probably enable me to determine the relative diminution in the area of deep cardiac dulness with greater accuracy than ordinary deep percussion or any other method of physical examination known at present." After a continuous experience of a year and a half, during which time I have had recourse to the ordinary method for purposes of comparison only, I gratefully and emphatically bear witness to the correctness of Dr. Watson Williams's view. I would state that my paper embodied nothing more than my own views, as, at the time when it was written, I was quite unacquainted with the literature on the subject.

In 1876, however, Dr. Noel Gueneau de Mussy published in the *Union Médicale* (3e. serie) an interesting paper on the subject under the denomination of "auscultation plessimétrique" but it is necessary to state that in matters of detail and application there are differences between the practice of Dr. de Mussy, Dr. Watson Williams, and of myself. Such as they are they do not touch the fundamental acoustic facts upon which auscultatory percussion is based. Dr. de Mussy stood at the side of his patient and percussed lightly and sharply on the spinal column near to the vertebra prominens, or on the sternum and clavicles, while his ear, applied to the chest, was moved from place to place on the opposite side of the thorax. Dr. Williams and I practise percussion by somewhat different methods on the same side of the body as that to which the chest piece of a binaural stethoscope is applied to convey the waves of sound to the ear.

On the subject of the acoustic basis of the method Dr. de Mussy suggests two alternative theories, namely, that the waves of sound, starting from the periphery, are either transmitted directly through the body, or conveyed by the enclosing structures, and are in either case modified by the varying densities of the subjacent tissues. It is also laid down that increased density of subjacent tissue diminishes the sonorosity and raises the pitch of the note elicited, and tuberculous, inflammatory, and other indurations as well as the heart and the liver are enumerated as causing the change of note. The author further states that where ordinary percussion yields but doubtful and equivocal results, the auscultatory method may yield diagnostic indications of great value.

My own observations would lead me to believe that the waves of sound are, as regards the thorax, mainly conducted by the walls. The effect of percussion on the clavicles, while the chest piece is made to travel to and from the region of the heart in different directions, as compared with those obtained when percussion is practised on the vertebrae, seems to me to be opposed to the idea that the vibrations are in the main conducted directly through the deeper structures.

Although Dr. de Mussy is able to quote the names of William and Trousseau as practical adherents of auscultatory percussion, it is evident from the following passage that he did not find the path of the innovator to be strewn with roses: "I foresee that one objection will be raised against this, as it has been against every other novel exploratory method; it is formulated in good faith by those who object to being disturbed in the enjoyment of opinions and of habits already formed, or who, without realising that it is so, dislike the labour of initiating themselves in a practice to which they have been hitherto unaccustomed. All this they say is very fine drawn and subtle; you are endeavouring to establish delicate distinctions, so delicate that it is not given to everyone to discern them."