Sarah W., aged 23, a healthy young woman, was admitted under the care of Mr. Holt, March 19th, on account of an abscess of the left breast which had been opened three days before her admission. Seven days after her admission she complained of pain in the right breast, which was much enlarged and tender to the touch; and on manipulation a hard lump could be felt deep in the gland. She had been suckling a child till a few days before her admission into the house, since which time the milk had been removed by a breast-pump. The pain and swelling were evidently referable to the confinement of the milk secreted; and in consequence of reports of cases in this JOURNAL in which this secretion had been stopped by the use of belladonna, it was resolved to give it a trial. The following ointment was therefore applied daily, spread on lint: One drachm of belladonna to an ounce of spermaceti ointment. Much relief immediately followed, the pain and swelling soon subsided, and on March 31st she was well enough to be discharged. The only treatment besides the application of belladonna consisted in the use of local support and of tonics, both of which she had been using previously.

HOSPITAL FOR SICK CHILDREN.

NECROSIS OF THE LOWER END OF THE SHAFT OF A LONG BONE IN CHILDHOOD.

Under the care of A. JOHNSON, Esq.

AN operation which was performed at the above Hospital on March 27th, affords another illustration of the fact pointed out in a recent number of this JOURNAL, viz., that necrosis of a limited portion of the shaft of a long bone near its articular end is much more frequent in children than is usually supposed. The patient in this instance was a little boy, who had suffered for several months from symptoms of disease of the ankle. There was much thickening of the lower end of the tibia from the deposition of new bone, but the articulation itself seemed quite free from disease. A sinus at the posterior border of the tibia, a short distance above its malleolar extremity, led into a cavity in the substance of the bone in which dead bone was easily felt with the probe; and on this opening being enlarged with the trephine two portions of loose bone were easily found and extracted. When put together, they were found to be about as large as a hazel-nut. All the parts in the neighbourhood seemed healthy.

ST. GEORGE'S HOSPITAL.

LIGATURE OF THE FEMORAL ARTERY FOR ANEURISM, AFTER THE UNSUCCESSFUL EMPLOYMENT OF PRESSURE.

Under the care of T. TATUM, Esq.

AN instance of the failure of the treatment by compression was witnessed here on March 16. The patient, an apparently healthy man, had been admitted previously with a small popliteal aneurism. The case seemed a simple one, and well adapted for the treatment by compression; as the sac was small, there was no implication of the knee-joint, nor any pressure on the venous or nervous trunks, and the man was in good health. Accordingly pressure was employed in the usual manner, and at first with good results. The pulsation diminished in power; solids began to be deposited in the sac. He bore the treatment well, and appeared well disposed to second the wishes of his attendants in regulating and directing the pressure. Still it was noticed that the size of the tumour did not much diminish. After three weeks use of the pressure it was omitted, as the pulsation had entirely disappeared. Nevertheless, the swelling did not subside; and after a few days it became obvious that it was, on the contrary, increasing, though no pulsation could be felt. The pressure was, therefore, resumed, and, as before, was borne perfectly well, but did not appear to produce any benefit, as the swelling continued slowly to enlarge, and an indistinct pulsation was thought to be perceptible in it. A consultation was now held as to the propriety of tying the artery; but as it was thought that the symptoms were not very urgent, and as it was possible that some error might have been made in the direction or application of the force, it was resolved to continue the pressure for a few days more, and even increased attention was given to the latter point. On the day before the operation, however, it was noticed that the tumour had nevertheless increased, and in the course of that day, after a severe attack of pain, the size of the swelling suddenly increased, and the diffused character of the semi-solid tumour left no doubt as to the rupture of the

sac. The operation had now become imperative, and was accordingly performed in the usual manner, by taking up the artery in Scarpa's triangle. Notwithstanding the lengthened employment of pressure, the cellular tissue did not appear in any respect unhealthy, and the artery was found as readily as is ever the case in persons who, like this patient, are of large and stout build.

REMARKS. In commenting on this case Mr. Tatum remarked, that the temperature of the foot had appeared, to those who were standing round the patient, to have fallen somewhat immediately on the ligature of the vessel, on which account the limb was swathed in cotton-wool before the man was removed from the theatre. He dwelt also on the unfavourable influence which the pressure of so large a mass in the ham, obstructing as it did the return of the venous blood from the foot, might have on the progress of the case. Otherwise the circumstances were tolerably favourable, as the man's health did not seem to have suffered, and no other disease was known to exist.

Original Communications.

CONTRIBUTIONS TO THE PATHOLOGY OF CARDIAC DISEASES.

By W. O. MARKHAM, M.D., Fellow of the Royal College of Physicians, Assistant-Physician to St. Mary's Hospital.

OPEN FORAMEN OVALE: LOUD SYSTOLIC BRUIT: TUBERCULOSIS OF THE LUNGS: CAN AN OPEN FORAMEN OVALE PRODUCE A BRUIT?

C. S., aged 4, had always been considered a delicate child. A year ago, she was, for some cause, under the care of my friend Dr. Sieveking, but had since then enjoyed good health up to the period of my seeing her. On Feb. 7th, 1857, the child was brought to the hospital by the mother, who informed me that she had been ill about three weeks, that she was falling away, had become thin and pale, had lost her appetite, and was occasionally sick; that she was also fretful and irritable, and had an occasional slight cough. On examining the chest, I found a rough loud systolic bruit, which was audible all along the base of the heart, and in the whole of the left subclavicular region; it was indistinctly heard below the nipple, and was scarcely audible at the heart's apex; its point of greatest intensity was to the left of the upper part of the sternum; it was not audible up the right edge of the sternum, along the course of the aorta. I found nothing abnormal in the sounds of the lungs, excepting only that I believed the subclavicular region of the left side was slightly duller, on percussion, than that of the right side. Taking into consideration the general condition of the child, the peculiar situation of the bruit, the absence of all symptoms of cardiac disease, and the possible presence of a left clavicular dull percussion-sound, I formed the diagnosis that the child was suffering from tubercular disease of the lungs; though at the same time, on account of the absence of other signs and symptoms of pulmonary disease, I placed a query by the side of the diagnosis entered on the paper.

During the following ten days, under the use of cod-liver oil and steel, the child appeared to improve in health. On the 18th, however, about twelve days after I had first seen her, she was brought to me, greatly altered in appearance. The mother informed me that, on the preceding evening, the child (who, up to this moment, seemed still improving) had been suddenly seized with violent convulsions and great difficulty of breathing, and that she had been struggling and fighting for life the whole of the night, the mother expecting that every moment would have been her last.

It was evident now that some serious mischief had fallen on the brain. Instead of being, as hitherto, restless and irritable, and hard to manage, she lay in her mother's arms, sleepy and drowsy, stupid, difficult to rouse, and partially senseless. There were also convulsive twitchings and jumpings of the right shoulder, but no paralysis. The face was flushed, the pulse rapid, and the skin hot and dry. There was no cough, nor was the respiration particularly affected: she breathed freely, in fact. On examining the chest, I found the heart's action violent; the bruit mentioned above was still present, but it was

now louder, rougher, and more prolonged; it was distinctly audible over the whole præcordial region, also over the upper part of the sternum, and along its right border. It was also heard remarkably loud in the whole of the upper half of the interseapular space—equally loud on either side of the spine. The lungs were carefully examined, but nothing abnormal could be detected in any portion of them. A note was made at the moment, that the respiratory murmur was every where loud and clear, and the percussion-sound good. Not the slightest râle was anywhere audible.

I may here observe, that the child was not altogether free from symptoms of cyanosis. It is true they were so little marked, that I should not have noticed them, had not the mother called my attention to the circumstance, that the child's feet were generally cold, and often of a blueish red colour; and that the small veins immediately around the nails of the hand were swollen and dark coloured. The serious condition of the child at the moment entirely distracted my attention from this particular fact.

Taking into calculation the signs and symptoms here recorded, I came to the conclusion that the child was now suffering from cardiac inflammation. I founded this opinion on the violence of the febrile action, the intensity and now wider distribution of the cardiac bruit, and the absence of signs and symptoms of pulmonary disease. The choreic twitchings of the arms, the strong beatings of the heart, and the cerebral symptoms, confirmed the opinion, that there was cardiac inflammation, and that the disease had secondarily involved the brain.

The child died about seventeen hours after I had seen her, and had made the above examination.

NECROPSY of the body revealed the following condition of the heart and lungs. The *Heart* presented, neither externally nor internally, the slightest trace of inflammation; nor was there, as far as the eye could judge, any deviation from their normal condition observable in any of the valves or of the orifices of the organ. There was neither constriction of the orifices, nor of the roots of the great vessels, nor any defect in the valvular apparatus. In all respects, the heart appeared healthy and normal, excepting one, and this was in an open condition of the foramen ovale. The foramen ovale, though largely open, so as to permit the point of a finger to pass from the right into the left auricle, was partially closed, on the left side of the septum, by a peculiar adjustment of the membranous valve. This membrane, about one-third of an inch wide, was attached at the upper and lower parts of the opening, but at its intermediate parts was free and unattached; in consequence of which, it would permit a stream of fluid to pass readily from the right into the left auricle; but, should the current tend to pass in an opposite direction—from the left to the right auricle—then the membrane, falling back on the opening, and acting as a valve, would prevent the flow of the fluid, excepting through two narrow semilunar slits which still remained unclosed, one on either side of the membranous valve.

The *Lungs* were dark coloured, and did not contract much when the thorax was opened. On incising them, I found that there was not a single portion of any lobe of either lung which was not studded with miliary tubercles. These tubercles, about the size of mustard-seeds, were equally distributed through all parts of the lungs, and were evidently deposited at a similar moment, for they all presented exactly similar appearances: they were placed at intervals of about half an inch apart. The lung-tissue intervening was perfectly healthy and crepitant, and readily distensible by inflation. Very little bloody serum escaped from the cut surfaces of the lungs, nor was any observed in the larger bronchial tubes.

REMARKS. Such was the history of the physical signs and symptoms carefully taken during life, and such the condition of the heart and lungs found after death, in this very interesting case. One or two points of considerable importance, affecting the diagnosis of the diseases of the heart and lungs, appear naturally to suggest themselves for consideration in connexion with the history.

What was the cause of the cardiac bruit? and how came it, that, with such a large and extensive deposition of tubercles in the lungs, no physical signs of disease of the pulmonary organs were present, when the chest was examined only seventeen hours before death, and that the respiratory murmur was then loud and clear, the percussion very good, and no râle anywhere audible?

When I first saw the child, I imagined that the bruit was in some way connected with, and in fact indicated, tubercular disease of the upper lobe of the left lung; for, as is well known,

we occasionally meet with a bruit in such case at the left of the sternum, taking the direction of, and therefore supposed to have some connexion with, the pulmonary artery; the hypothesis being, that the artery or its branches are at some point compressed by the swollen mass of the tubercular lung. The history and cause of such bruit, however, I may observe, are very obscure; and, whether the condition mentioned be the true one or not, it is very clear, from the nature of the bruit heard in the present case, its extent, its loudness, and the position where it was heard most intensely, that it is not to the tubercular condition of the lungs that we must look for its explanation.

It seems, then, not unnatural—as the valves and orifices of the heart itself were normal, and as no change of structure could be found in the aorta, or in any of the parts around the great vessels at the root of the lungs—to suggest, that the bruit had its origin in the open foramen ovale. On any other supposition, the bruit seems inexplicable. But here we are met with the difficulty, that, in all cases of open foramen ovale hitherto met with in which bruits have been heard during life, there have been found (where examinations have been made after death), in addition to the open foramen ovale, abnormal conditions in other parts of the heart, or of the great vessels, such as of themselves might be considered sufficient to produce the unnatural sound.* And then, again, it is asserted, *à priori*, that, from the very nature of the parts implicated, it is scarcely possible a bruit could be produced from an open foramen ovale. Let us consider shortly the value of these two objections.

I may, in the first place, safely conclude that, in this heart, there really did exist no abnormal condition beyond that of an open foramen ovale; for the organ was submitted, at the Pathological Society, to the inspection of some of our most distinguished cardiac pathologists, and they could discover none other.

If we consider the question, we shall find, that the fact of some other abnormal state of the heart having been always found present, coincidentally with an open foramen, in cases where the bruit had been heard during life, does not militate against the idea, that an open foramen ovale may of itself, under certain conditions, give rise to a murmur. For is it not very possible that such murmur may have been present in many cases simply of open foramen ovale, but was not discovered during life, because the disturbances to the circulation, produced by the simple lesion, were not of themselves of a nature marked enough to excite attention? In cases, and these are the most ordinary kind, where the pulmonary artery is at the same time constricted, it is evident that disorders in the heart's action must ensue, such as would inevitably demand notice. Cases where the foramen ovale must have been partially open during life, and yet where no symptoms to mark the fact had been observed, are frequently met with; and assuredly, in the majority of these cases, it would be a complete begging of the question to affirm, that no murmurs really existed during life. It is more correct to say that, in the very great majority of cases of simple open foramen ovale, disturbances in the circulation do not occur, and therefore no examination of the heart is made during life. Practically speaking, how many cases are there on record, where simple open foramen ovale has been found after death, in which the observer can affirm that no murmur existed during life? I suspect, very few; and if so, then it follows, that there is no evidence positively demonstrative of the non-existence of such a murmur; and that the objections to it are purely hypothetical.

In the next place, why should we judge such a bruit to be improbable, on account of the nature of the conditions under which it must be produced? Let us shortly consider what these conditions are. It must be remembered that the bruit was heard during the time of the systole of the heart's ventricles, and must have therefore been *coincident with the diastole of the auricles*. A bruit arising at an open foramen, coincidentally with the systole of the auricles of the heart, appears to be an impossible occurrence, for the reason that (the foramen being open, and consequently the blood in the two auricles freely communicating) the pressure on the blood during the auricular systole would be equal in both auricles, and consequently there would be no tendency of currents of

* Dr. Walshe, who must be as well acquainted as any one with the real position of the case, states in his work on the *Heart and Lungs*, p. 711:—"I do not know that we are in a position to assert positively, that patency of the foramen ovale will in itself cause murmur; for in all the records that I have met of the coexistence of the two things, either constriction of the pulmonary orifice is actually stated to have existed, or it may have existed."

blood to pass from one auricle to the other. But a very different condition of things obtains during the diastole of the auricles; then, the blood, rushing from the venæ cavæ and the pulmonary veins into the relaxed auricles, might readily find its way through an open foramen ovale, and, under certain conditions, conceivably produce such vibrations as would be represented by murmurs to the ear of the auscultator. How, indeed, can it be asserted with confidence, that, in those cases of open foramen ovale associated with other defective conditions of the heart, in which murmurs were heard during life,—how can it be asserted, that none of the murmurs ever arose at the open foramen? Why is it assumed that they always take their origin in those other defective conditions, whatever they be, of the heart?

In the present case, the anatomical condition of the aperture of the foramen was plainly most favourable for the production of vibrations, viz., a thin membranous band stretched across the opening, and attached only at its two extremities. A current of blood rushing through such an aperture, from the right to the left auricle (and we have seen that the current could not pass from left to right) would hardly fail to throw the membrane into a vibratile state. Any impediment to the passage of the blood through the lungs, and consequently through the right side of the heart, would naturally tend to increase the flow of blood through the foramen ovale, by obstructing its ready exit from the right auricle into the right ventricle. In this case, we must suppose that the tubercular condition of the lung impeded the circulation, and so might have increased the intensity of the bruit, as it was last heard during the life of the patient.

Again, it has been objected that the force of the blood flowing into the auricle from the venæ cavæ is not sufficient to give rise under such circumstances to a bruit. To this I will answer, that great force in a current is not always necessary to produce a bruit, and that under a favourable combination of things a weak current may occasion a very loud murmur. Let me call to mind: a prolonged loud and thrilling diastolic mitral murmur; the roaring bruit, which is so often heard in the necks of anæmic girls, produced by the least pressure of the stethoscope on the cervical veins. Even over the radial artery of anæmic persons I have on two occasions heard a bruit which, if heard over the cardiac region, would have been called a loud blowing murmur. If such currents of blood give occasion to such murmurs, why not one resulting from the rush of blood from the venæ cavæ—the venous trunks of the body—into the right auricle, and then through the open foramen ovale.

For such reasons, I think the objections to the probability of the bruit being in this case formed at the foramen ovale untenable. One argument in favour of the view I hold I have not yet mentioned, though I think it a very powerful one; it is this: If the bruit was *not* formed at the foramen ovale, what produced it? I certainly think it much more rational to believe, that a long and loud bruit, such as this, heard on several separate occasions (and most carefully observed) at a peculiar part of the thorax in front, and loudly also in the interscapular region, arose at the open foramen, than to acquiesce in the proposition that some inexplicable mystery involves the subject. I have given, I think, fair reasons why, *a priori*, there is nothing improbable in the existence of such a murmur; and the facts, as here related, appear to me to justify the conclusion, that a murmur so produced really did exist in the present case.

Another fact of considerable interest was observed in connection with the lungs. I have stated that, seventeen hours before death, a careful examination detected no alteration whatever from the healthy state at any part of the chest, either in the percussion or auscultation sounds of the lungs; and that, nevertheless, there was found, after death, no portion of either lungs in which were not thickly strewn miliary tubercles. The fact that tubercular matter may be deposited, under certain conditions, in the pulmonary tissues, and yet produce no alterations in the physical signs, such at least as our senses can detect, has long been admitted by our best auscultators; but it is one which we have not frequently an opportunity of positively demonstrating, and I venture to think has been of late somewhat overlooked. There are writers, for example, who speak of a pretubercular stage of phthisis; but how do they prove the non-existence of tubercle in the lungs in such cases? Evidently they can only do so by forming their judgment on the absence of those physical signs, which indicate the presence of foreign matters in the pulmonary tissue. How fallacious such a mode of judging is, seems proved by this case.

The absence of morbid physical signs is no *proof* of the absence of tubercle in the lungs; and therefore to speak of a pre-tubercular stage of phthisis (or indeed of pulmonary phthisis at all, apart from the presence of a tangible materies morbi in the lungs) appears an abuse of language, unwarranted by true observation or by fair hypothesis. Let me put the case in another form. Would the warmest supporters of pre-tubercular stages of phthisis venture to call *that* a case of tubercular disease of the lungs, in which, however strongly marked during life had been the signs of their (so-called) pre-tubercular condition, no tubercle could be found after death? In this respect, and as demonstrating the difficulties which beset the auscultator, I venture to think this case well worthy of record.

The reasons why physical signs of disease are absent in cases of this nature are, I think, plain. Skoda says: "There are no distinct signs by which we can with certainty diagnose the existence of acute miliary tubercles; we can only surmise their existence. Solitary tubercles do not of themselves produce the slightest change in the percussion-sound of the lungs, even though they be scattered through these organs in very considerable quantity." In this case healthy air-containing tissue intervened between the tubercles; and so no alteration occurred in the percussion-sound. The respiratory murmur was clear and loud; because the air entered freely into all parts of the lungs. There were no râles; because there was no inflammatory exudation; indeed, the tissues when cut across were, comparatively speaking, remarkably dry.

The pathological specimens on which the above remarks are founded, excited some discussion at the Pathological Society, and I have therefore detailed the case at length. It appears to illustrate a new fact in relation to the origin of cardiac bruits; and to demonstrate a point of great practical significance in the diagnosis of pulmonary disease. In another respect the case is instructive, and exemplifies a well-repeated apothegm—(too rarely illustrated practically) viz., that our errors are sometimes full of instruction. I know not whether some exceedingly cunning observer might not have escaped the complete error of diagnosis into which I fell; but of this I am sure, that the majority of us would have infallibly agreed with me at the moment in the false diagnosis, had they seen and heard the symptoms and signs as I saw and heard them. At all events, if the views I have taken regarding the origin of the cardiac bruit be correct—and I do not see on what grounds they can be disputed—it is certain that there is established by this case the existence of a source and mode of origin of a cardiac bruit, as yet neither recognised nor admitted in the history of the physical diagnosis of the abnormal sounds of the heart.

ON THE LOCAL ENCOURAGEMENT OF SCIENCE BY THE STATE.

By HENRY W. RUMSEY, Esq., Cheltenham.

AN important question has been mooted at the two last anniversaries of the British Association for the Advancement of Science, namely, "Whether any measures could be adopted by the Government or Parliament that would improve the position of science and its cultivators?"

Before offering any suggestions of my own, I wish to express my unqualified assent to the principal propositions which have been already made by eminent persons, and which are embodied in the printed reports of that association; such as—the institution and liberal endowment of professorships of physical science, where these do not exist in sufficient number and variety, at our universities; the encouragement of the study of physical science by the foundation of scholarships, fellowships, and other similar rewards for proficiency therein; the localization and accommodation of various learned and scientific societies at the cost of the nation, in an appropriate building in the metropolis; and the constitution of a central board of science, composed partly of persons holding offices under the Crown, and partly of men of the highest distinction in science, to whom the Government might refer for aid and advice in the application of national funds, and in the public execution of projects for the promotion of science.

But the object of the following suggestions is to endeavour to show that the Government and Parliament might, with equal reason, be called upon to establish and maintain, in every district of the kingdom, an organised system of scientific investigation and statistical record in the various departments of