imposed over the liver, is inaudible or but faintly heard (Fig. 6).

An effusion into the pleura is at once detected by the tuning-fork. As the diagram explains, the tuning-fork is heard only over the liver when the stethoscope is superimposed over that organ, and but faintly heard, or is wholly inaudible, when it is applied over the lung, over the seat of the effusion into the pleura, and over the abdominal contents below the liver. This is a fact of great clinical assistance, for neither by percussion, palpation, nor by auscultation can it be positively diagnosed whether the dullness and absence of breath sounds is due to effusion into the pleura or is due to the liver being pushed upwards towards the lung by abdominal distension, etc. In the same way a congestion of the base of the

Fig. 6.—When liver and spleen touch. s, Stethoscope over liver distinguishes—• loud sounds over liver; and, o, no sounds heard over spleen.

right lung—a not uncommon feature in the tropics—is readily distinguishable from congestion or inflammation of the liver (Fig. 7).

Passing from the solid viscera to a hollow viscus—the stomach—it will be found that the tuning-fork answers true, for by this method the dimensions of the stomach

Fig. 7.—Effusion into pleura. s, Stethoscope; Tract of tuning fork from lung to abdomen; • loud sounds; o, faint sounds.

Fig. 8.—With stethoscope placed anywhere over stomach. • Loud sounds heard; o, faint sounds heard.

are definable with precision; the writer has tested the accuracy of the method in question with that of x-ray examinations, whether by screen or photographs, and finds the tuning-fork is as accurate as the x-ray findings (Fig. 8).

The dimensions of the caecum can also be accurately told, and the difficulty at times to be certain whether an apparently movable caecum is not really a movable right kidney is at once settled. The track of the large bowel can also be followed for some distance, for when the stethoscope is placed upon the caecum the vibrating tuning-fork can be heard as it is carried along the ascending colon and across the body along the transverse colon as far at least as the middle line. In various abdominal, pathological, and other conditions, the tuning-fork method of diagnosis may be of service, and has proved so in the writer's hands. The dimensions of a pregnant uterus, of an ovarian cyst, of a large uterine fibroid, etc., can be readily gauged by the tuning-fork-stethoscope method.

In fractured bones the method under discussion is also applicable. When a thigh bone or any of the large bones of the limbs are fractured anywhere along the shaft, the stethoscope placed over one end, say over the great trochanter of a fractured femur, the vibrating tuning-fork placed on the lower end of the bone, just above the knee, cannot be heard so well as on the femur of the sound side. A fractured rib can also be recognized from its intact neighbours, and when the stethoscope is placed far back on the shaft and the tuning-fork far forward, it is easy to detect the difference between the note in the fractured rib or ribs and the sound given out by the ribs above and below. A doubtful fracture of the sternum or of the collar bone can be detected in a similar manner.

The dimensions of the heart, and its relation to the lungs, can be readily gauged when the stethoscope is placed on the chest over the cardiac area and the tuning-fork is made to pass in various directions over the area occupied by the lungs around the heart.

I have been making observations on the different tones which seem specific to different affections of the liver; that a fatty liver conducts sound less loudly than a cirrhotic liver is certain, and so with other ailments, but the evidence is not sufficiently advanced to tabulate the sounds peculiar to each condition.

When applying the tuning-fork it is better not to drag it along the skin, but to raise it and "dab" it on the skin at short intervals. As the limits are made out they may be marked by a pencil in the usual way.

EPIDEMIC CERVICAL ADENITIS WITH CARDIAC COMPLICATIONS.

By S. T. PRUEN, M.D.,

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DURING the autumn and early winter of 1912 I saw several cases of tonsillitis, accompanied by unusually tender cervical glands, but not by any other complications so far as I remember. Convalescence was very slow, and I accounted for their unusual severity by calling them influenzal.

In the middle of January, 1913, a young lady came from Hastings to stay at my house, and almost at once developed tonsillitis, with swollen and tender cervical glands. My daughter was attacked a day or two later; a few days after I developed the same condition, with, in addition, very troublesome subacute laryngitis, and it was some weeks before I felt quite well. Later in January I saw two more cases, similar in all respects, and equally tedious. In February I was called to see a man, aged 40, who had just come down from Sheffield.

CASE I.

This patient had a temperature of 102° F. and a sore throat, accompanied by swollen and very tender cervical glands, and was feeling very ill. A few days later a diphtheria-like growth appeared in both tonsils, and spread to the pillars of the fauces and the soft palate. I felt sure the case was not one of diphtheria, and sent a swab from the growth to Dr. Collins, who reported: "Streptococcus; no Klebs-Loeffler bacillus." Two days later Dr. Collins saw the case with me, and took a specimen, the examination of which confirmed the result of the first. Dr. Collins prepared a vaccine, and I inoculated the patient several times, but the entire diphtheria-like growths came away just before I injected the first dose. The patient was three weeks before he could leave his bed, and several more before he recovered his strength. The heart sounds were feeble, and occasionally intermittent, but there was no dilatation and no bruit. The urine was normal throughout.

CASE II.

My next case was a lady, aged 40, who had slight tonsillitis and a few rather enlarged, very tender glands. In a week or two a mitral murmur had developed. After many weeks she quite regained her strength, but did not quite lose the murmur. She was much weaker than could apparently be accounted for by the disease; and I tried to satisfy myself by saying that she had had an influenzal throat.

By this time I had heard that Dr. Kirkland considered these cases, of which he had seen several, to be instances of a new disease. Cases began to multiply, and I had six in one house. I realized that they were astonishingly like one another, but not quite like anything else I knew, and that they were infectious and bred true.

CASE III.

A boy, aged 9, at school, had an attack early in May. The right tonsil was swollen and congested, the inflammation spread over the anterior and posterior pillars of the fauces, and the cervical lymphatic glands on the same side became so enlarged that the case looked like a severe attack of mumps. The glands enlarged were the parotid and submaxillary lymphatic glands, and a gland which I shortly began to observe was almost unvaryingly enlarged in these cases, as it also is occasionally in other tonsillar troubles. It lies in the angle where the facial vein opens into the internal jugular, and when enlarged is easily felt a fingerbreadth below the angle of the jaw. I will speak of this as the jugulo-facial gland; Kuttner calls it the *Haupt-ganglion*. The boy had a temperature varying

from 100° to 104° F., with a good deal of headache and general ache. In a fortnight his doctor thought him cured, and I agreed with him. He was my nephew, and so was removed to my house to convalesce. Two days later the whole trouble started over again, but this time on the left side; the urine was normal, he had no heart disorder, and was convalescent in a fortnight, but it was several weeks before he was fit for his normal amount of exercise.

Whilst I was looking after this boy in my own house I was faced with an epidemic of the same disease at an institution where there are 120 men; about 22 men went down in the first ten days.

Child. Tonsils congested; glands slightly tender; mitral and aortic murmurs; dilatation of heart.

CASE IV.

One of the first was a man, L., who came in with a very slight sore throat, and slightly enlarged and tender glands, but with a temperature of 104° F. He appeared to be desperately ill from the first. For the first week he had constant rigors, axillary temperatures of 105°, 105.4°, 106.4°, and 106.6° F., violent delirium, incontinence of urine, and occasional haemorrhages from both mouth and bowel. A swab from his throat, taken at the commencement of his illness, was sterile. Dr. Collins drew off some of his blood, and found a long variety of strepto-

Case IV.—I, Inoculation. S, Sponging.

coccus with pronounced haemolytic properties. He then made a vaccine from it, but when it was ready the patient was so ill that he thought it hardly worth while to make an injection, yet he did so, and after several injections the man recovered. His life was saved, I have no doubt, by the vaccine. This patient never had any cardiac trouble, and four months later he was able to take a light post as teacher.

This contrasts with the previous one. In the one case severe glandular trouble and no serious complications. In the other case almost no gland trouble, but severe septicaemia. This has been my experience throughout—the more severe the gland trouble the less severe the complications.

CASE V.

The next case, W., came in with a temperature of 102° F. Like L., he appeared very ill, but had no severe disturbance of the throat or glands. In consultation with Dr. Collins I inoculated him with L's vaccine. In forty-eight hours he was well, though weak. He had previously been put to bed and a purgative given, as he was constipated and had a very foul tongue, so that the rapid recovery after the vaccine may have been a coincidence. In a week he was able to sit up a short time; in another week he was able to return home, but he was not fit for work for still another month.

CASE VI.

A few days before either L. or W. were taken ill, a man, A., came in with his throat congested but not much swollen; the cervical glands, though tender, were only slightly enlarged. The temperature, which varied between 99° and 100° F., subsided during the week, as did most of his other symptoms. The heart was examined night and morning. On June 1st, about ten days after A's admission, when he was apparently convalescent, I noticed a very slight systolic bruit with the first sound. Next day there was a loud murmur with the first sound, and a less marked one with the second. The following day both murmurs were equally well marked, and the heart's apex was half an inch beyond the nipple line. On June 4th the murmur with the second sound was diminishing in

CASE VII.

intensity, and on the day after the murmur with the first sound had begun to diminish and the dilatation decreased. In a few more days the murmur with the second sound had almost disappeared. The temperature during the whole cardiac trouble had varied between 97° and 98° F., and the pulse between 60 and 70. Four months later he could walk two or three miles, but he had not regained his full strength, and had not recommenced work. The mitral murmur still remains.

CASE VIII.

On the same day that A. developed endocarditis, another man, D., was seen with slight throat and gland trouble, so

CASE VIII.

he felt quite well. By evening the murmur was much more distinct, and by the next day there was a murmur with the second sound as well, and the heart's dullness had extended beyond the nipple line. During the next ten days the murmurs

diminished in intensity, the pulse varied between 64 and 74, and the temperature between 97° and 98° F. By the middle of June the apex had retreated to the nipple line, there was a systolic murmur still at the mitral, a reduplicated second sound, and a loud systolic murmur over the pulmonary valves; the pulse was 83, and regular in force. He can now walk slowly for two miles, but cannot manage hills or walk quickly. On standing up the pulse goes up from 80 to 96. The murmurs are still present, but not so well marked.

CASE VIII.

Another man, B., who came in at the same time with still slighter throat and gland trouble, was at once sent to his home in the town, and told to send for his doctor. A week later he came back to visit his fellow sufferers, but said he had been so well that he had not sent for his doctor. I found a very slight systolic murmur with the first sound. I told him he must call in his doctor, who informed me in the evening that B. had loud murmurs with both sounds heard over all the areas. I saw him again next day and verified the diagnosis. In this case the murmurs developed in about six hours, whilst the heart dilated and began to beat irregularly. In a few days matters quieted down, and left him with only a mitral murmur, but the dilatation did not quite go down for over two months. During all this time the temperature was subnormal, and the pulse about 80. He still has a systolic murmur, an irregular beat, and the pulse when he stands up rises from 84 to 104.

We had about twenty cases at this time at the institution, and amongst them four cases of endocarditis and one of acute septicaemia, besides other complications; I was at the same time having similar experience outside, as were also some of my colleagues. Altogether I had about sixty cases, fourteen with cardiac complications.

CASE IX.

In the middle of May I was called to a master at a school, D., aged 27. He seemed so ill that I removed him from his lodgings to a nursing home. I examined his heart daily for a fortnight. At the end of that time a faint murmur could just be noticed over the mitral area, both before and after the second sound. The next day there was a very obvious murmur over the aortic valves, and the pulse became of the water hammer

Case IX.

type. On the following day there was a well-marked murmur with the first sound audible all over the heart, and the heart itself became noticeably dilated. The temperature was subnormal from early in the illness. Four months later the heart condition had improved, and the patient looked and felt better, but there was still some dilatation. There was a diastolic and possibly systolic murmur with the second sound, a rough first sound, and an accentuated pulmonary.

The onset and progress of the heart condition in this case was so similar to that found in my previous cases,

Case x.—Adult. No throat trouble; gland very tender three days; mitral murmur persistent.

that I felt sure this must be another case of the same disease, although there was no history to support my conclusion, and no evidence of sore throat or enlarged glands during the entire illness.

CASE X.

In the beginning of June I was called to see a lady who had an enlarged and very tender gland between the sternal and clavicular heads of the left sterno-mastoid muscle. There were some other slightly enlarged glands behind the sterno-mastoid and in the posterior triangle on the same side, but they were of old standing, were not tender, and apparently had nothing to do with the present attack. The gland diminished in tenderness and daily decreased in size, so that as I had examined the heart and found nothing wrong with it, I felt, after a week, that I could not reasonably go on visiting her.

CASE XI.

Three days later I was asked to see, in a house where I already was attending the mistress, who had been suffering from a severe attack of the disease, a lady's maid, who had congested fauces, red and swollen tonsils, but only one gland enlarged and very tender. It was the same gland as that in my previous case. This condition of throat and neck, with the obvious source of infection, left no doubt in my mind that this patient also was suffering from the disease.

I now felt more than ever sure that my previous patient must have been suffering from it too. I accordingly examined her chest, and found a distinct systolic mitral murmur. The next day this was more marked, and there was slight dilatation, which passed away in a day or two, and there has been no extension to other valves; the cardiac condition has improved, so that the patient, four months later, could take moderate walks, but the mitral murmur has not disappeared. As in the other cases the temperature has been subnormal throughout.

We thus had three cases occurring simultaneously. One had a typical throat with one typical enlarged and tender gland, in a house with other cases of the disease. Another had no apparent throat trouble, but the same typical gland, followed within a week by cardiac trouble. The third, after being unwell for a couple of weeks, with no obvious symptoms, suddenly developed a very typical attack of endocarditis of a more serious nature than that of any other cases, but not otherwise different from them. I have seen other complications in a few cases.

CASE XII.

A man, P., developed spreading phlegmonous inflammation of the left tonsil and surrounding parts, which pushed the structures half an inch beyond the middle line, blocking the faucial opening. I tried to evacuate the pus by inserting a cataract knife for 1½ in. into the tonsil through the distended soft palate, but without result. Finally a small abscess burst behind the tonsil, and the swelling subsided, but so gradually that for weeks afterwards the palate was still damaged to such an extent that it might easily have been mistaken for partial paralysis following on diphtheria.

These large phlegmonous inflammations, concealing a quite small and deep-seated focus of pus, seem to be a not uncommon feature both in throat and neck in these cases. I think, too, they explain one point in a letter from America which I will refer to further on.

CASE XIII.

Another man developed orchitis, a not very painful swelling of the body of one testis. This subsided within a fortnight.

CASE XIV.

W. M., aged 19, developed a curious train of symptoms. On July 5th his right tonsil began to swell, but did not cause much discomfort. The jugulo-facial gland on both sides, and one just behind it on the left, were enlarged and moderately tender, as also was one just behind the sternal notch. Two days later spots, tender on pressure—due, I imagine, to inflamed glands—appeared at the sternal ends of the right first and second and left first intercostal spaces. Next day the humeral chain of glands in the left axilla became swollen and tender, and on the following day those in the right axilla. On this same day a harsh, stridulous sound, so loud as to mask the heart sounds, and best heard in the first right intercostal space near the sternum with both expiration and inspiration, was observed. It had the character of the sound which would be expected to be produced by an enlarged gland pressing on the trachea. Next day, July 10th, it was hardly audible, and the glands in the axilla had almost ceased to be tender. The tender spots in the intercostal spaces and the glands in the neck also improved. On July 12th he sat in an easy chair for a short time, and next day for a few hours, but felt giddy on standing. He had a feeble heart-beat between each ordinary beat; this disappeared after two hours' rest in bed. He was several weeks before he felt quite himself again. With the exception of the first day or two, when the temperature was slightly raised, he had a subnormal temperature and a pulse varying from 54 to 64 throughout his illness and a good part of his convalescence.

That a gland could make such an impression on the trachea as I have described is evident to me from a case which I attended this year. I was called one night to see

CASE XIV.—YOUTH. Slight tonsillar congestion; glands enlarged three days; stridulous breathing two days; intermittent irregular beat.

a boy, aged 15, with urgent dyspnoea. No air could be heard entering the right lung; the heart was labouring heavily, and the right side so distended that it could be detected by palpation and percussion 2½ in. to the right of the mid-sternal line. There were no other signs or symptoms. Hypodermic injections of strychnine, the inhalation of oxygen, and the application of poultices relieved him. Twenty-four hours later the dyspnoea suddenly came on more urgently than before, and artificial respiration only staved off the end for an hour. Dr. Kirkland saw the boy with me during life, and also attended the *post-mortem* examination next day. We found the right heart extremely engorged; the middle and lower lobes of the right lung were quite black with engorgement, and a fragment sank in water. There were some enlarged glands pressing on the right bronchus, which was flattened, contracted, and for the space of 1½ in. below the branch to the upper lobe intensely congested inside. Dr. Collins examined the engorged lung, and found it sterile. Whether this was another instance of the glandular infection we have been considering I do not know; but if W. M.'s gland on his trachea had been twice as swollen as it actually was I think he must have died, and that his end would have been even more speedy than was this boy's.

Pain in the occiput and back of the neck, and even tenderness on deep pressure in this region, were frequent, and as the retropharyngeal glands are so easily injected experimentally from any portion of the naso-pharynx and tonsillar region, I am inclined to think that the enlargement of these glands must be a constant accompaniment of this disease. If they were much involved the trouble would easily spread through the suboccipital triangle, and account for the symptoms described. The tonsil drains both directly into the upper cervical glands, especially the jugulo-facial, and indirectly into them through the submaxillary glands. The tonsillar inflammation, even when quite slight and superficial, extends over the pillars into the mouth and pharynx both very freely and very early, and the wide-spreading nature of this primary trouble is no doubt responsible for the wide-spread glandular infection which follows the onset of the disease. But the still more widely-spread glandular infection which is apt to follow later is no doubt due to the virulence of the poison spreading rapidly from gland to gland. This was shown by many of my cases, but by none quite so conspicuously as by that of W. M., whose glands were evidently infected through one another, for there was quite obviously no mischief in any of the areas, for instance, drained by the lymphatics of the humeral glands.

I have seen letters describing extensive epidemics of this disease in two or three towns in England. I have myself had cases who arrived in Cheltenham with the disease on them from three other towns in England, and medical friends, nurses, and laymen have told me of, or written to me about, epidemics or groups of cases occurring in fifteen

other towns of Great Britain and Ireland. I also know of cases in Belgium, France, Saxony, and America. Some of my correspondents may be mistaken, but it is highly improbable that all are.

A nurse wrote to me from a town in North America to say that there had been an epidemic in the boarding house in which she lived, and that thirteen patients had been ill with it. They had inflammation of the tonsils and adjacent structures, and swollen necks. They had been attended by two physicians, who called in a specialist, and one patient had her tonsil lanced seven times. There has evidently been an epidemic of a similar but much more serious nature in the United States, but I will not refer to that as Dr. Kirkland is describing it in detail.

The incubation period in my cases seemed to be three or four days.

The feature of this disease that most strikes an observer is the unusually large, unusually tender, and unusually numerous glands, so large and so tender that on more than one occasion both medical men and laymen have asked me the question, "Are you quite sure that this is not a case of oriental plague?"

But, though the swollen and tender glands are the features that at once arrest the observer's attention, yet the importance of this new disease lies in the insidious onset of cardiac lesions, which are in most cases slight; the dilatation, under rest, is temporary, but a murmur may persist. So devoid of premonitory symptoms is this complication, and so very widespread the disease, that one cannot help feeling that there must be at the present time a large number of unsuspected cases with cardiac lesions who are walking about and, by doing so, endangering the integrity of their hearts. We have to deal with a "silent endocarditis," not as a clinical curiosity, but as a prevalent disease.

I am not prepared to determine the nosology of this epidemic disorder. It is not mumps or rheumatism, nor septic tonsillitis; nor, as I was at first disposed to call it, for want of a better term, influenza; nor is it glandular fever, from which it differs by the absence of nephritis, except in some cases, and of enlargement of the spleen, liver, mesenteric, inguinal, and axillary glands, and by the presence in almost all cases of tonsillitis and pharyngitis, and in many of mild carditis or endocarditis. Moreover, adults are more frequently attacked than adolescents, and adolescents than children. I am disposed to think it is a new or hitherto unrecognized infectious disorder, and that it is caused by a streptococcus, probably a new variety.

EPIDEMIC CERVICAL ADENITIS WITH CARDIAC COMPLICATIONS.

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In October, 1912, I saw, in consultation with Mr. Buckell, a boy aged about 14, with cardiac mischief quite unlike anything I had previously seen.

Some time before he had consulted Mr. Buckell on account of not feeling very fit. Mr. Buckell examined his chest and found nothing amiss. He told him to rest in bed; the temperature, taken morning and evening, was normal, and the pulse was quiet and regular. But in a few days a murmur appeared at the mitral orifice. It was then I saw him. The boy was healthy looking, there was no pallor, the tongue was clean, there was no definite evidence of throat trouble, no glandular swelling in the neck, no rash on body or limbs, no joint pains or swelling; no history of growing pains or past chorea. The pulse was 72, regular in volume and rhythm, the temperature was normal, there was no sweating, and there was nothing abnormal in the urine. The apex beat was in the normal position, but there was a soft systolic bruit at the apex conducted towards the axilla, and a slightly accentuated second pulmonary sound.

Sixteen days later Mr. Buckell again asked me to see the lad. The mischief now had extended from the mitral to the aortic valve, and we had the see-saw murmur of aortic obstruction and regurgitation. The slow smouldering endocardial fire had done this great damage without the boy feeling or looking ill, for his temperature all this time had reached 99° F. on one occasion only, and his pulse was never quick and always regular; there was no joint pain or swelling, and no sweats; there was no enlarged painful spleen or haematuria or embolitic phenomena on skin or in the lungs. We could call it an infective endocarditis, and there our knowledge ended, for Dr. Collins examined the blood and found it sterile.