issue in about six weeks. Cabot² mentions two cases of lymphatic leukaemia, one with 912,000 red cells and 23,000 white cells (97 per cent. lymphocytes), the other with 700,000 red cells and 600,000 white cells (99.8 per cent. lymphocytes) per cm.

The absence of any notable enlargement of the lymphatic glands is interesting, although there are undoubted cases of lymphatic leukaemia recorded in which a similar condition prevailed.

We are indebted to Dr. Heron, under whose care the patient was, for permission to publish this case.

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SPONTANEOUS GANGRENE OF BOTH LOWER LIMBS IN A MAN AGED 36.*

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THE following case is of interest as presenting not only unusual features in itself, but also from the diagnostic point of view, as it baffled the most careful efforts of all who came in contact with it in its earlier stages:

History.—A man, aged 36, first came under my care in November, 1899, and was then suffering from what appeared to be an influenzal attack, with a slight pleurisy at the left base; he was not very ill, but had a persistent temperature of half a degree above normal, which took nearly six weeks to subside. At that time I examined him as systematically and as carefully as I could, and could find nothing to account for this persistent temperature except the slight pleuritic friction above referred to. In the spring of 1900 he had another similar illness, which did not last so long. In June of 1900 I examined him on behalf of a sickness and accident insurance company, and found the heart and lungs normal, chest expansion unusually good, and chest very well developed; urine normal, liver dullness normal, nervous system normal excepting for the presence of a fine tremor of the tongue and of the hands, the voice was also somewhat tremulous. The pulse was normal as to frequency, but small and compressible; radial arteries normal; temperature normal. I was unable to elicit anything unfavourable in his personal or family history. (I may here mention, however, that I attended his wife in confinement in October, 1899, and that a few ham-coloured maculae appeared upon her face and arms during the puerperium. The baby had "snuffles" for a few weeks. There was no history of any miscarriages, and there has been no further evidence of specific trouble in either.)

As regards the husband's personal habits, I was informed by himself that he had always been temperate as regards alcoholic beverages, and his partner in business also informed me that he had never known him indulge in alcoholic excess of any kind. He was an inveterate smoker. I had, therefore, considering all that, no hesitation in passing him for insurance, but, considering the tremors already referred to, I recommended that he be accepted at an increased premium. He was passed for life insurance by another medical man about the same time and as a first-class risk. From that time till the beginning of the present year he remained in his usual health and attended regularly to his business.

State on Examination.—On January 17th, 1901, I was called to see him at his home, and found him suffering from severe pain—which had been present for about a week before—over the ball of the little toe of the left foot; the pain was very much increased by touching the part, and it extended along the sole of the foot towards the heel. It also extended for a few inches up the posterior aspect of the leg, but was not very severe in that region. The pain was worst at night. Sensation to slight touches was diminished over the little toe. There was no marked tenderness on deep pressure of or on squeezing the muscles of the calf. The knee-jerks and other reflexes were normal. The tongue was slightly coated with a light yellowish fur. The appetite was poor; the pulse varied from 80 to 100, and the temperature was 99° F.

Diagnosis and Treatment.—My diagnosis, failing anything better and in absence of the usual signs of neuritis, was rheumatism, affecting the ligamentous structures of the sole of the foot. I accordingly put him on antirheumatic diet and drug treatment, cutting off alcohol in every form and also tobacco. (It was at this time that I first became aware that the patient had for several years been in the habit of taking several "pick-me-ups" of brandy or whisky every day, and that he was in the habit of having a glass of brandy in his coffee before going to business every morning. It was then obvious that this was the probable explanation of the tremors of hands and tongue.)

Progress.—During the first two or three weeks he improved somewhat under this treatment; the pain was not so severe, but he was still unable to walk. As he was anxious to return to business, I advised that he should go to a watering place and put himself under a medical man there with a view, if the latter thought it advisable, to having local hot-air baths. He therefore went to one on February 12th, placed himself under a medical man there, and was recommended to have the limb subjected to the local hot-air treatment. He was also put on a generous daily supply of alcohol. Notwithstanding this he gradually got worse, the hot-air applications caused excruciating pains in the leg, he lost flesh gener-

ally, and became extremely weak, and the calf muscles of the affected leg wasted considerably. I next saw him on April 24th, when he was seen by a consulting physician who diagnosed neuritis, with which diagnosis I concurred, although even yet the knee-jerks were normal or only very slightly diminished, but at the time no other diagnosis seemed possible. The patient again returned to the watering place, changed his medical man there for another, and the latter asked me to see the case with him on May 11th, the patient still getting rapidly worse. We went again carefully over his case and agreed that it was one of neuritis, although a slight bluish tinge and slight coldness of the foot made us take the question of Raynaud's disease into consideration. Opinions and treatment alike, however, the patient gradually got worse, and about a week later the coldness and blueness of the foot had become more marked, and definite gangrene set in. On May 22nd he was brought home, and on arrival I could detect no pulse lower than in the common femoral at the groin. I accordingly called Mr. Horrocks in, and he amputated the limb about 7 inches above the knee, on the following day.

Operation.—The method used was short anterior and posterior flaps of skin, with circular section of the muscles. The main vessels were thrombosed above the seat of amputation, and there was practically no haemorrhage. The anaesthetic used was ether. There was a very moderate amount of shock following the operation, and the pulse, which before the operation had been 106 and the temperature 102.4°, fell respectively to 84 and 98° the same evening.

Subsequent Progress.—Two days later the temperature had fallen to 97.4° and the pulse to 73. The following day—that is, the third day after the operation—the patient began to complain of severe pain in the calf of the right leg, and of numbness and tingling pain in the right foot. On inspection the foot was found to be somewhat pale and cold, and pulsation could not be detected in the posterior tibial artery at the ankle, and was somewhat doubtful in the popliteal space. By the fifth day the pulse had again reached 110, but the temperature did not rise over 99°, and gangrene of the right foot was evident. I then advised amputation of the right leg, and made arrangements for Mr. Horrocks to operate the same day, five days after the first operation.

Second Operation.—The operation was done in the same way as the former one, only an inch lower down, that is, 6 inches above the knee, and ether was again the anaesthetic. The same condition of the vessels was found as in the left leg. The shock was much greater than on the former occasion, the temperature dropping that evening to 97°, and the pulse being 131.

After-Progress.—The following day the temperature began to go up, and on the second day after operation reached 102.2°, and it became evident that sepsis had occurred. I therefore took out some stitches and irrigated the wound, and by the fifth day the wound had become fairly clean and healthy in appearance. From that time on recovery was uneventful: the temperature never rose above 99.4°. To prevent a tendency to gaping of the wound, where it had been necessary to remove the stitches, I applied extension to the stump. The left stump healed in about three weeks after amputation and the right in about four weeks. Five weeks after the first operation the patient was able to sit up, the tongue had become clean, it had almost lost its tremor, and the appetite was better than it had been for several months; the pulse, however, still kept between 90 and 100. Insomnia was a prominent feature throughout, and I had to use hypodermic injections of morphine pretty freely. On July 31st he went to the seaside, and came back in the middle of September looking and feeling better than he had done for six or seven years; his appetite was excellent, and he had gained 2 stone in weight. Since his return he has resumed his business; at present a pair of artificial legs are being made for him.

On examining the amputated limbs I found thrombi filling all the arteries from the popliteal downwards, and on dissecting the right leg I found that the gastrocnemius was of normal appearance, but on reflecting that muscle and examining the soleus underneath I found that the latter had lost the usual red colour of healthy muscle, and had assumed a colour resembling yellow ochre. This I take to be an indication that the thrombotic process had started below and spread upwards, thus cutting off the blood from the soleus (which in its lower part is supplied by a branch of the posterior tibial artery), before the supply was cut off from the gastrocnemius, which is supplied by one of the crural branches of the popliteal higher up. On making a considerable number of sections of the arteries of this limb I failed to find any cause for the thrombosis, but on examining sections of the posterior tibial and popliteal arteries of the left leg I found well-marked calcareous degeneration of the middle coat of the artery, and here and there patches of atheromatous thickening of the intima. When placed in acid and examined under the microscope the sections give an effervescence of CO₂, thus verifying the diagnosis of calcareous degeneration.

As to the precise cause of atheroma everything is not definitely known; probably it is but part of that general fibrosis which, sooner or later, causes each one of us to "shuffle off this mortal coil"; and probably gout, rheumatism, syphilis, and alcoholism are simply accidental factors which accelerate its onset. Heredity in many cases is an important factor, as is evidenced by its appearance occasionally in children who are too young to have suffered from any self-contracted vice. Young found it in an infant, Wilson in a young child, and Andral found it in the aorta of a child 8 years old.¹ It may be taken as an axiom in medicine that "a man

* Read before the Bradford and District Medico-Chirurgical Society.

is as old as his arteries," and that, comparatively speaking, it is possible for a man of 80, without atheromata, to be younger than a man of 30 who is the subject of it.

Atheroma is essentially a form of chronic arteritis affecting chiefly the middle and inner coats of arteries, but occasionally to some extent the adventitia as well. This chronic inflammatory process, like most inflammatory processes when chronic, leads to hyperplasia of the tissues affected, but chiefly to hyperplasia of the subendothelial connective tissues of the intima, giving rise to opaque, milky-looking, non-vascular patches, somewhat raised above the general surface of the intima. These patches may organize and become converted into dense fibroid tissue; or, on the other hand, the deeper parts may undergo fatty degeneration, break down and form a fluid, or semi-fluid cheesy mass constituting the so-called "atheromatous abscess." This may in time be entirely absorbed, leaving a thinned and weakened spot on the vessel wall. Sometimes an area which has undergone atheromatous degeneration may become impregnated with salts of lime, and form the calcareous plates so frequently found in the arch of the aorta. Instead of becoming absorbed or infiltrated with lime the atheromatous abscess may burst internally and its contents be discharged into the blood stream, leaving behind a raw surface on the intima known as an "atheromatous ulcer," on contact with which the blood will clot and form a thrombus.

Associated with this degenerative process in the intima, the middle or muscular coat of the artery frequently becomes thickened, and usually more so on one side than on the other, so that on transverse section it appears to be of a "signet ring" shape. Associated with this thickening of the media there may be a deposition of lime salts giving rise to calcareous degeneration of the middle coat. But this process, although present in the specimens shown, is no essential part of atheroma as such. It may be found quite independently of atheroma, and atheroma may be present where it is absent. It is met with as an independent disease, chiefly affecting the smaller arteries such as those of the limbs or viscera, converting the vessels into rigid tubes, through which the blood flows in a sluggish manner.² Generally speaking, however, it is a concomitant of atheroma, and gives valuable assistance in the diagnosis of the latter. It affects considerable tracts of the smaller arteries, and it may be present in one part of an artery and absent in another. Thus it may be present in the radial and absent in the brachial, or vice versa. It may exist in the femoral and be absent in the tibials, or it may be present in the tibials and absent in the femoral.

As regards diagnosis of atheroma, we are accustomed to associate it with cardiac degeneration and granular kidney, but as this case shows it may be independent of either. Most of the textbooks give the arcus senilis as one of the concomitant symptoms which may help us to form a diagnosis, but the arcus senilis is often seen in people with no suspicion of atheroma or vascular fibrosis of any form, and again it may be present, according to published cases in quite healthy young people, and absent as this case shows in cases of marked atheroma. Probably the most reliable sign of atheroma is the presence of calcareous degeneration of the radial, brachial, temporal, and tibial arteries or cerebral symptoms, such as hemiplegia due to thrombosis, where a sound heart enables embolism to be excluded, and when there is not the loss of consciousness usually associated with cerebral haemorrhage. Loss of memory for recent events may also be taken as one of the cerebral symptoms of atheroma.³

Then, again, a loud, prolonged, and purely systolic murmur heard over the aortic area, and conducted upwards towards the right clavicle, may reasonably be accepted as evidence of atheroma of the aorta, since pathologists tell us that narrowing of the aortic orifice due to endocarditis of the aortic cusps is of extreme rarity in the *post-mortem* room when contrasted with the frequency with which such murmurs are heard during life.⁴ As in this case, numbness and tingling pains of the extremities, when persistent, may be due to progressive anaemia from atheroma of the vessels supplying the affected parts. The personal history and personal habits of the individual may also afford valuable information, as there appears to be no doubt that alcoholism is a most powerful factor in the production of atheroma; but, after all is said, cases like

the present will probably occur when one can only be wise after the event.

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ON TREATMENT OF HAEMOPHILIA WITH CALCIUM CHLORIDE.

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IN May, 1901, a patient, A. S., aged 25, came to the Dental Department of King's College Hospital for advice as to her teeth. It appeared from her story that two months previously a tooth had been removed for her at another hospital in London, and that the haemorrhage resulting therefrom continued for thirty-six hours. This so alarmed her that she was compelled to return to the hospital, where the bleeding was arrested by plugging, though even this procedure was not for some time successful. She was advised by the surgeon who attended her at that time that in future she must always warn any dentist of her tendency to excessive bleeding should he find it necessary to perform any further extractions. On investigation it was found that she gave a very definite history of haemophilia, which seemed to manifest itself on the very slightest provocation, though, as far as I could ascertain, the rest of her family were free from this diathesis.

Her appearance was very unhealthy indeed, that of a more or less chronic dyspeptic, which fact was entirely borne out by the foul condition of her mouth and general dyspeptic symptoms; she was not anaemic, and not subject to "purpura" or other condition associated with excessive haemorrhages except as stated. Her teeth were almost without exception carious and foul, many of them having abscesses, and all beyond hope of such conservative dentistry as we are able to employ in the dental department of a general hospital.

Before proceeding with a general clearance of her mouth, which the hopeless condition of her teeth necessitated, I decided to give her a preliminary course of calcium chloride internally, with a view to increasing the coagulability of the blood. She was ordered a mixture containing 10 gr. of this salt thrice daily for a week, and at the end of that time to return to the hospital, when, so as to be on the safe side, I contented myself with extracting one tooth only, and that an incisor, so that the socket could be very easily plugged if necessary. The haemorrhage resulting was, if anything, slightly more than one sees in the ordinary way, but at the same time nothing that could be regarded as in any way serious, and there was no recurrence on her return home.

She was directed to continue the calcium chloride, and after the lapse of another week I extracted three teeth, or rather what remained of them, with a similar satisfactory result as regards absence of excessive haemorrhage. She had then to leave London for three weeks, and, though she had been provided with a sufficient supply of the medicine to cover that period, for the last week of the three she neglected to take it. Hoping, however, that her previous dosing would at least have produced some effect, I extracted one tooth, and on this occasion the haemorrhage was more than on any of the previous ones, though at the same time not such as to require heroic measures.

I then increased the dose of calcium chloride to 15 gr., to be taken as before, and gradually removed all the remaining septic stumps, extracting as many as three or four at a sitting, each and every occasion being perfectly normal from the bleeding point of view.

Since the above case I have had one other typical haemophilic under my care who was treated in the same way, and with a similarly satisfactory result. Of course one cannot state positively that the absence of excessive haemorrhage in these two cases was due to the preliminary dosing with calcium chloride; but the fact remains that though previously both of these cases bled to excess on receiving the smallest wound, yet after a course of this calcium salt no trouble of this kind was manifested, except as stated above, when the patient neglected to take it for a week. Beyond the unpleasant taste,