These observations appear to me to be opposed to the doctrine, that albuminuria is ever due to the transudation of a modified or more easily diffusible form of albumen.

I have shown that the coagulation temperature, as determined by Dr. Lauder Brunton (*St. Bartholomew's Hospital Reports*, vol. xiii) and Mr. D'Arcy Power, cannot be relied upon to afford any distinction between different forms of albumen, if such there be, as it depends upon the quantity of albumen and salts present. "The urine of a case of subacute nephritis, pale, faintly acid, specific gravity 1008, showed signs of coagulation when the thermometer, with its bulb immersed below the surface of the urine, marked 112° Fahr. Coagulation was looked for by the side of the bulb. The urine contained three-fourths of a column of albumen. Diluted five times, the coagulation point rose to 120° Fahr.; diluted ten times, to 130° Fahr.; twenty times, to 145° Fahr.; forty times, to 170° Fahr.; eighty times, to 180° Fahr. The same quantity of fluid and the same apparatus were used on each occasion."*

These facts appear to warrant the following conclusions.

1. The body present in urine which is coagulated by heat or precipitated by neutralisation is almost invariably serum-albumen, rarely paraglobulin.

2. The presence of paraglobulin alone in the urine is still somewhat obscure, and has not been correlated with any clinical group of cases.

3. The maximum amount of albumen excreted by the kidneys is during the after-breakfast period, and this relation is maintained in spite of the more albuminous character of the midday meal.

4. While there can be no doubt that nitrogenous diet increases albuminuria, this is not due to the absorption of undigested albumen, but to the increase of nitrogenous excreta, and the consequent stimulus to the usual functions.

CASES OF SYSTEMIC ARTERIAL AND PULMONARY EMBOLISM.

By W. VAWDREY LUSH, M.D., M.R.C.P.,

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CASE I. Embolism into the Right Axillary, Left Brachial, and Right Middle Cerebral Arteries: Recovery.—In December 1873, I saw in consultation a gentleman forty-six years of age. He had had varicose veins for some time, and was then suffering from an inflamed condition of the external saphena vein of his left leg. Subsequently, the right leg became similarly affected. In both, the pain, tenderness, and swelling gradually subsided, and the patient, being apparently convalescent, was left to the care of his usual medical adviser. His pulse was then 68. He was in no pain. His tongue was clean. But, although alkaline remedies had been administered, his urine after his dinner still remained turbid and acid.

On the evening of December 24th, the patient was sitting up in bed rubbing his left leg, the one which had been first affected, when he felt pain in his cardiac region, followed by some difficulty of breathing. His medical attendant was sent for, and examined his heart, also his lungs anteriorly and posteriorly, but could detect no morbid sound; but the pulse had risen from 68 to 98 in the minute. This increased frequency continued for two days. On each day, the patient sat up in his room.

About half-past seven in the evening of December 26th, he was carried by his wife and son from his chair across the room to his bed, supporting himself with his arms round their necks. He stated that, as they laid him on the bed, he felt a little palpitation, then slight giddiness, and then lost the use of both his arms. I saw him with his medical attendant at 10 o'clock. There was no pulse to be felt in either wrist; there was none in either brachial artery; there was none in the right axilla; but pulsation could be felt below the right clavicle, and also in the left axilla and in both carotids. The patient was perfectly conscious; he had no difficulty of breathing. He said he did not feel very ill, but complained of most severe pain in his right arm. There was no loss of motor power. He perspired freely. At one time, neither cardiac pulsation could be felt, nor cardiac sounds heard, but the patient revived on being laid down and given some brandy and water. The pain in the right arm continued for some hours, and then gradually subsided. The passage of an induced galvanic current through the arm seemed to afford relief. He was given five grains of carbonate of ammonia and ten drops of laudanum with some ether every two hours.

At 8.30 the following morning, the patient was free from pain, except at the tips of the fingers of the right hand. He was quite conscious

and composed, and related explicitly the circumstances of his attack. He had slept about twenty minutes. At 9.45, the patient appeared faint, and a twitch of the face was noticed. His voice, which had been hitherto clear, became muffled. He was partly comatose. The pulse in the temporal arteries was 84. Respiration was somewhat stertorous, 16.

December 28th. The tongue was pointing decidedly to the left when protruded. The cardiac pulsations were 92; respiration 16. He was taking nourishment well.

December 29th. The cardiac pulsations were 96; respiration 16; temperature 100°. Feeble pulsation was felt in the left radial artery.

December 30th. There appeared to be complete paralysis of the left arm and leg. The tongue still pointed to the left. Hearing was more acute than natural.

December 31st. Pulsation was felt in the right axilla; also in the left wrist.

January 1st, 1874. The pulse counted in the left radial was 84; the heart's pulsations were 84.

January 3rd. The pulse was felt in both wrists.

January 4th. There was perhaps slight movement in the left leg. On the 18th, he flexed it.

From this time, he gradually recovered. Upwards of five years have elapsed, and he is still living, can walk with the aid of a stick, has some power in the left arm, and is able to attend to his business and other duties.

I do not think there can be any doubt that this patient was attacked with arterial embolism. In my opinion, a thrombus had formed in the left auricle or left ventricle, had passed up into the aorta and divided, one portion passing into the right subclavian artery and another into the left, lodging in the one case below the clavicle, and in the other below the axilla. The next day, a portion of this clot was shot into the right carotid, passed into the right middle cerebral, and was followed by left hemiplegia. Eventually, the circulation became re-established, and there was partial recovery from the paralysis, that in the leg being as usual much more complete than that in the arm.

What was the cause of this blood-clotting? I believe, the excessively fibrinous or gouty condition of the blood. We know how prone gouty persons are to attacks of phlebitis; and throughout this patient's illness, his urine, in spite of alkaline remedies, was acid and deposited lithates.

Some who have heard of this case have supposed that the dislodgment of a clot from the veins of the leg would account for the symptoms; but a moment's reflection would show that such a clot would not pass through the pulmonary circulation to the left side of the heart, and be of sufficient size to block an axillary artery. In my opinion, the clot formed in the heart itself, and was thence carried into the arteries.

This case may be contrasted with that of a lady who no doubt suffered from three attacks of pulmonary embolism.

CASE II. Three Attacks of Pulmonary Embolism in One Individual: Recovery.—Some years ago, I was summoned to London to a near relative, who was dangerously ill. This lady, fifty years of age, had for some time suffered from profuse menorrhagia, associated with an uterine tumour, probably of a fibroid character, and she had had some swelling of her left thigh and leg. One day, just after a profuse catamenial period, she was attacked with pain in the chest, which became intense; her lips and nails became blue; she was apparently dying. On my arrival, she was somewhat better, but her pulse was rapid. There were most painful attacks of dyspnoea, the patient being obliged to sit up in bed, thirsting for air, as Trousseau describes it. This continued night and day; there was phlegmasia dolens of the left leg, which was swollen to a frightful extent. The patient's sufferings were most intense. During nine days and nights, she only once obtained two hours' consecutive sleep. Opium was of no avail, and a dose of chloral-hydrate caused her to leap out of bed.

At first, auscultation revealed nothing; but, on the seventh day, a pleural friction-sound was detected on the left side. She was then seen by my good friend and teacher Dr. James Andrew of St. Bartholomew's Hospital, who diagnosed embolism of one of the branches of the pulmonary artery. At his suggestion, five-minim doses of tincture of digitalis were given, and the patient was supplied with abundance of fruit, so as to lessen the liability to coagulation of the blood. The correctness of the diagnosis will be proved by the sequel. Finding opiates of no avail, I totally discontinued them, and sleep followed.

The phlegmasia of the right leg gradually subsided, and then the left became similarly affected. At length, the patient recovered sufficiently to be wheeled on a chair into an adjoining room, where she lay on a couch and went to sleep. In the evening, she was wheeled back to her bed; and, not wishing to disturb her attendant, endeavoured to get into bed herself, giving her leg a jerk in doing so. Im-

* *Birmingham Medical Review*, 1879, p. 227.

mediately, she was seized with a recurrence of her old formidable symptoms, gasping for breath, her pulse 140 and upwards, rapid respirations, blueness of the nails and lips. This fight for life continued for hours, when she fell asleep apparently from exhaustion, and gradually the distress subsided; and the leg, which had been so swollen, rapidly returned to nearly its normal dimensions.

At that time, there was no repetition of the evil; but, fourteen months afterwards, the patient, who had continued to suffer from her pelvic troubles, awoke from sleep with a third recurrence. This attack, which was sufficiently alarming, but not so severe as the former, lasted for about eighteen hours; and, at a venture, I tried a hypodermic injection of morphia, which appeared decidedly beneficial. Gradually the distress subsided, and there was never another attack.

To summarise: in the case of systemic arterial embolism, we had immediate cessation of the pulse in both brachial and radial arteries, without any orthopnea, distress of breathing or lividity, but tendency to death by syncope and, later on, hemiplegia. In the case of pulmonary embolism, we had urgent dyspnea and orthopnea, the thirst for air of Trousseau, rapid pulse, lividity, and tendency to death by asphyxia.

In conclusion, I would add that, although but too frequently the physician has to deplore that his practice is a "meditation upon death", still recoveries from such grave cases as I have narrated call upon us to persevere and take courage.

NOTES OF A CASE OF RHEUMATIC PERICARDITIS, WITH TETANY.

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THE patient who forms the subject of these "Notes" exhibits features of more than ordinary interest, inasmuch as the affection termed tetany is one not often met with, or at least one which is seldom noted by authors. So far as I can make out, no English writer has described this interesting condition of spasms, almost idiopathic in nature. The subject has been treated of by French authors under varying titles; at one time being called "intermittent tetanus," and at others, "idiopathic muscular spasm", "contraction of the extremities", and "idiopathic paralysis with contraction". Trousseau, one of the chief writers hitherto on this point, was at first in the habit of calling it "rheumatic contraction of nerves", but soon gave up that description for one first applied by Corvisart in 1852—viz., *tetany*.

The first mention of the disease in the many authors at my command is that by Dance, in 1831, in the shape of a memoir, entitled "Observations sur une Espèce de Tétanos Intermittent," to be found in the *Archives Générales de Médecine* of that year. It would appear from those writers, particularly Trousseau, that the puerperal and menstrual periods, as also the conditions diarrhoea and rheumatism, were states favourable to the accession of those interesting muscular spasms, though nothing definite is known of the pathology.

With a view to the eliciting of further information, through the medium of the Association's JOURNAL, on this most interesting complication of commonly recurring conditions, I shall detail a few facts ascertained by me in my case, which has been under careful notice since Nov. 28th, 1878.

The patient, E. H., aged 13 years, residing at Stockton-on-Tees, first came under my notice on the above-mentioned date, suffering from pericarditis, with effusion and aortic insufficiency. The symptoms were: pains over the cardiac region, extending over the left shoulder to the scapula and down arm to the finger-tips; tumultuous heart's action, irregular pulse, dyspnea, inability to lie on the left side; anxious expression, and tendency to syncope. On auscultation, a distinct to-and-fro friction-murmur was to be heard all over the cardiac area; and on percussion, which was most painful, dullness was found to exist over an enlarged area, the extent of which, however, was not ascertained, owing to the agony caused by manipulation of the left chest. The previous history tells us that the little patient had rheumatic fever two years and six months ago, with which she was confined to bed for five weeks, and on recovery her friends were informed by their then medical attendant that "her heart was affected." Four days before I was called in, she had pains resembling subacute rheumatism from the description given me; the reason I was sent for being the presence of intense pain over the cardiac region, and the accession of spasmodic contractions of thumb and fingers of the left hand on the palm. Not knowing what to make of those spasms, I merely treated the case as if they did not exist; that is, at the first; as shortly I had no doubt in my own mind as to the nature of the contractions, attributing them, as I did, to the condition

termed tetany, carefully eliminating any symptoms of hysteria and epilepsy. The progress of these spasms was most interesting; the thumb and fingers of the left hand being first affected, then those of the right similarly, the thumbs being forcibly adducted, and the fingers tightly overlapping them. Next, the toes of the right, and then of the left foot were flexed, and the heels somewhat retracted; and on December 9th the condition was, the fingers and thumbs flexed on the palms, the hands on the forearms, and these on the upper arms; the toes flexed, the heels retracted, the legs flexed on the thighs, and a semi-lateral decubitus to the right. Several attacks occurred to-day, lasting for about ten minutes each time, the contractions being forcibly relaxed.

This state of matters obtained off and on, with varying intermissions as regards time, up to January 20th, when the spasms ceased until the 31st, at which time she had three slight attacks, but without contractions. From this time up to February 23rd she had several minor spasms, but on this day she was very ill, having had a series of spasms during her sleep, though being only partially roused. Blueness was observable round the mouth, and extending from the *alae nasi* over the cheeks; there was intense cardiac oppression. Up to this time, she has been much better, though not clear of spasms.

The treatment throughout was applied in accordance with the rheumatic condition which obtained, with its consequent cardiac complications and albuminuria, with the result that the patient is now able to do some light household work and take exercise in the open air. I think there can be no doubt but that the rheumatic affection in this instance was the cause of the spasms, there being nothing else to be found at all likely to account for them. There have been no attempts at menstruation.

May 30th, 1880. Her condition is much the same generally. There is a well-marked mitral systolic murmur.

ON APOPLEXY OF THE LUNG FROM CARDIAC DISEASE.

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I SEND the following cases for publication, as they may be interesting to the readers of the JOURNAL.

The first is a case of bronchitis, with apoplexy of the lung, occurring in consequence of a fatty and much dilated condition of the heart; the other is an example of the same accident arising from mitral-valve disease.

I was sent for by A. B., aged 43, by trade a roller, on June 3rd, 1874. He was a stout well-built man, who had evidently indulged freely in eating and drinking all his life. He had never ailed much before, except from slight attacks of hepatic derangement brought on by drinking too heavily. He was now suffering from great difficulty of breathing and severe cough. He complained of a sense of tightness across his chest. The expectoration was frequent and great in quantity, principally of a mucous character; the pulse was 95 per minute, very weak, almost imperceptible; the tongue was foul; his appetite poor, and bowels costive. The urine was high, of specific gravity 1021, acid, small in quantity; no albumen. The liver was slightly enlarged. There were no head-symptoms, but slight general anasarca. Bronchial *râles* could be heard all over the chest; there was no dullness. The sounds of the heart were hardly audible; its impulse was exceedingly weak. The arcus senilis was evident. On June 8th, his cough was much worse, and he now brought up a large quantity of blood. On examination, I found the lower third of the right lung quite dull in front; and on the following day the lower two-thirds was dull, and respiration was quite bronchial. Bronchial *râles* could be heard as before in the upper third and the whole of the left lung. The pulse was 85, exceedingly weak. The heart-sounds were hardly to be heard, and the impulse was scarcely perceptible. Respiration was difficult and frequent. The skin was moist. He continued to cough up blood every day, and to become weaker. On June 10th, his pulse rose to 120. Breathing became more difficult. The skin became dry; its temperature rose to 103°. He still continued to cough up blood, which was now accompanied by rusty sputum. On June 13th, he died.

On making a *post mortem* examination, I found the heart very much dilated; the walls were exceedingly thick, and the whole organ had undergone fatty degeneration. There was not any valvular disease. The left lung was comparatively healthy, but congested and slightly cedematous. The right lung was large, of a dark colour generally. The upper third was very cedematous. Certain portions of the middle and lower lobes were quite solid and dark, perfectly airless, and blood could be scraped from the surface. In one part of the lower lobe could be seen a portion of hepatised lung. The localised pneumonia