mapped out by many successors, and much, such as our acquaintance with the gouty and syphilitic conditions of the kidney, has been added to what Bright first revealed. The presence of albumen points with index finger to the diverging roads of many pathologic changes. If, by the process of exclusion, we find it is not owing to mechanical obstruction, the result of cardiac or pulmonary disease, we assign to it a humoral origin—a morbid condition of the blood. It is now admitted that the different forms of kidney-lesion come from a conservative effort in the system to free itself from the noxious materials diffused in the circulatory fluids. Their irritant qualities give rise to tissue-changes. We are aware also how retained urinary excreta produce inflammation of the serous membranes, and that uræmia often proves fatal. Again, as one more example of many consequent on this new knowledge, it may be said that cardiac complaints have received much elucidation. Blood thus poisoned gives rise to obstruction in the minute vessels and capillaries. The heart labours to overcome such obstruction. Excess of function has an hypertrophic tendency, and more especially in the left ventricle. But the result does not stop at mere hypertrophy: vital nutrition is impaired; tissue-metamorphosis eventuates, and thus molecular perversion supplants the sarcois element and substitutes olein. In other words, there is fatty degeneration; and then follow dilatation of the cavities, more especially of the right side, and visceral congestion with effusive products.

Our better acquaintance with the retrograde metamorphosis of the tissues is a prominent feature in the recent progress of pathology. Indeed, it may be said that a clearer conception of these degenerations can hardly, in a practical point of view, be over-estimated. To recognise these gradual mutations of structure, such as the granular, the fatty, the albuminoid, and the calcareous; to know that they thicken, diminish elasticity, and render brittle organs and structures concerned in vital processes, is to prepare us for sequential occurrences, and to confer knowledge of paramount clinical importance. To know in the young a tendency to *ramollissement* in the central commissures; and in those of advancing years, and the aged, to detect fatty waste in the cardiac ventricles, or to shrewdly suspect stiffening of the cerebral arteries, is to put us in possession of such information as may confer some power, at least, in deferring other contingencies. We can then comprehend the correlation between a soft heart and apoplexy, and between the narrowed calibre of some artery in the brain, and the circumscribed decay of white structure. The kind of knowledge now indicated, and which has latterly overgrown former attainments, has notably modified treatment. Practice, once strangely termed heroic, has passed into the domain of history; the old notion of a phlogiston has all but departed, and hence we hear less of antiphlogistics; we bear in mind that the sum total of disease means perverted function with correlated nutrition change, and that vice, in these interstitial processes, is from diminished rather than from excessive vitalism, and thus our remedial endeavours have become mainly supporting and sustaining, as contradistinguished from the hypotheses and convictions of a passing age. Next in importance may be named the discovery of Kirkes and Virchow. Embolism and thrombosis have solved problems which previously had received very different kinds of solution. They have explained morbid actions, which before were wrongly interpreted. A piece of lymph is swept afar in the current of the circulation, and plugs a distant vessel, it may be in the spleen, the liver, the kidney, or the brain. Disease, by this abrupt cutting off of nutrient blood-supply, follows, which used to be referred to the doctrine of crasis. Those pyramidal patches in the solid viscera, which are preceded by congestion, the consequence of blockage, and that pass into the suppurative state, and which Rokitsky explains on the dyscrasial theory, are doubtless caused by embola; and the purulent deposits spoken of by Rayer, in his great work on the kidneys, are now referable to a like cause. Nothing amongst our recent attainments, relative to pathologic and chemic changes in dead parts, are more interesting than embola and thromboses.

With regard to inflammation, a condition with which, both as physicians and surgeons, we have much concern, no great mutation of views has latterly obtained. Cellular pathologists have long told, and still tell us, that its leading phenomena are those of abnormal nutrition. The doctrines held respecting it may be looked upon as a sort of compromise between solidism and the humoral theories. From a truer conception of its essential nature has come great gain. The object now is to favour plastic exudation, and not to lower vitalism, and thus degrade effusive materials.

With a more demonstrable and sounder pathology, is a clearer recognition of those eliminative efforts in the system, which may be deemed conservative. To favour, not to subdue and check their excess, is generally the aim of our remedies. We now are aware that blood-poisoning is frequently the etiological explanation of many morbid phenomena. In diabetes, the elimination of sugar is protective from

worse results. The flow of bile through the ductus communis, from some temporary or permanent cause, being arrested, the secretion is revulsed into the circulation, when the urine carries out that which would be harmful, if retained. In gout, the giving off of uric acid, and the deposit of urate of soda, are salutary. Malaria, or the specific poisons of typhus, enteric, or relapsing fever, are contracted when the bowels and skin form the great outlets whereby nature essays to cast out the noxious agents. The alvine evacuations in cholera, it is now held, are to be favoured rather than restrained, as by these outpourings the system is eliminatively relieved—a doctrine which has become widely accepted. In variola, the pustular deposits on the surface are a means whereby nature frees the blood from materials which could not innocuously be retained in the circulation. And of the other exanthems the same observation holds good. By this mode of reasoning, the majority of chronic cutaneous affections may be accounted for; because it is now allowed that certain alterations in the composition of the blood produce disturbances in the investments of the body, from modified blood-distribution, consequent on changes in the nerve-centres, the more apparent secretorial products being essentially eliminative, and consequently dermatologists, in these days, look deeper into the pathology of skin-diseases than the epidermis and the derma. This spontaneously curative effort of elimination may also occur without the expulsion of morbid products from the system. For instance, in dropsies; effusion is determined into the great cavities of the chest or the abdomen, or, it may be, into the pericardium, or the areolar tissue, when local vascularities become relieved, or, perhaps, saved from rupture, and the more continued congestive and inflammatory states are benefited. We then mark how such event mitigates the more urgent and distressing symptoms of an acute stage. For example, in pericarditis and endocarditis, when the heart labours and the pulse intermits, with the outcome of the fluid into the pericardium follow lessened præcordial impulse and intermittence, and often an expression on the part of the patient as being more comfortable. In pleurisy and in peritonitis, the advent of effusion, sometimes with much suddenness, cuts short the more prominent characteristics of the inflammatory phenomena. Various other illustrations of the salutary tendency of this eliminative secretion might be cited had time allowed.

Another great addition has been made to pathology by our being far more conversant with the affections respectively known as pyæmia, septicæmia, and ichorrhæmia. It is now allowed that the last named may have its origin in hospitalism, and from without, and that it may also be caused within the organism. From recent and extended discussions, it is also clear that this affection is by no means confined to hospitals, as it was once assumed, but that it may, and does, occur in the most healthily situated houses in the country, remote from deleterious gases, and in the purest atmosphere. We now acknowledge the difference between pyæmic and infective inflammation and septic action; and pyæmic disease can hardly be said to obtain without more or less of septicæmia as the concomitant, but the septic action is far feeblér and less irritative. Most pathologists now believe that the transference of pyæmic products from one part to another is by means of the lymphatic system or of the veins. Some have lately spoken of idiopathic pyæmia. In such cases, most probably the local starting point, or focus, has not been discovered. There still remains much that is uncertain relative to these affections; yet we can now anticipate a train of diseased processes which formerly were much less suspected, and, when they did occur, were far less understood.

[To be continued.]

CASE OF RENAL CALCULUS BECOMING VESICAL: LITHOTOMY: ABSCESS OF KIDNEY: PERITONITIS: DEATH.

By J. H. PORTER, Surgeon-Major, Assistant Professor of Military Surgery, Royal Victoria Hospital, Netley.

PRIVATE H. W., 103rd Regiment, aged 20, eight months in the service, on May 7th, 1873, whilst exercising in the gymnasium, pressed his abdomen against the horizontal bar, and immediately felt a most acute cutting pain in the right hypochondrium. He continued to suffer from acute paroxysmal cutting pains, which obliged him to go into hospital, where he remained a month under treatment, and was discharged apparently cured. A fortnight afterwards, the pain returned, and compelled him to again seek admission into hospital, whence he was sent to the Royal Victoria Hospital, Netley, on July 30th. On arrival, he presented a healthy aspect; his circulatory and respiratory systems, temperature, and urine were normal; he, however, could not rest on his

right side, and he complained of severe cutting pain in the right hypochondrium, which was tender on pressure, and somewhat fuller than the left. A tumour, about the size of the palm of the hand, was found to occupy the lower part of the right hypochondrium and upper part of the iliac region; it was smooth, firm, and elastic, with a defined circular border, on the left side, but on the right the margin was more irregular.

Opinion at that time differed as to the nature of the tumour, some thinking it probably hydatid, growing from the under surface of the liver, others that the kidney was implicated. About the beginning of October, he began to suffer from rigors and perspirations, which were excessive at night; his temperature rose to 99.5, his pulse to 90. The tumour increased a little in size, and became more painful.

These symptoms continued off and on until October 28th, when they became greatly aggravated. The rigors became more frequent and severe, as did also the nocturnal sweats; the pain became worse, and his appetite failed. On the following day, he complained of scalding sensation accompanying micturition, which became very frequent. His urine was found to be turbid, of a pale yellow, nearly white, colour, depositing, on standing, a yellowish sediment; specific gravity, 1014; reaction faintly acid. Pus-cells were found to be present, also some very large cells, most of which were round or oval, though some had processes. Each of those cells was nucleated, and contained large brilliant nucleoli; crystals of triple phosphate were also present. The appearance of these large cells led to the belief for a short time that the tumour was of a cancerous nature, the kidney, in all probability, being the seat of the disease. During the next two days, the tumour decreased in size, the pain diminished, and large quantities of pus came away in the urine.

On November 1st, he again experienced very severe paroxysmal pain along the course of the ureter, and the right testicle became retracted. On the 2nd, he was suddenly seized with difficulty of micturition. An instrument was introduced to relieve him, and, after the urine was drawn off, the bladder was sounded, and a distinct click of a calculus heard. The tumour now began rapidly to decrease in size, large quantities of pus passing through the urethra.

On the 11th, the tumour had nearly disappeared; the urine was slightly turbid, containing only a few pus-cells and triple phosphate crystals.

On the 17th, the tumour had entirely disappeared. The urine was quite clear, but contained a few pus-cells; his general health was good; he slept and took his food well, but occasionally suffered from slight shooting pains in the right hypochondrium and slight frontal headache. The bladder was occasionally examined, the sharp click of a calculus being always present.

Little change took place in his condition from the latter end of November to December 16th. He was most anxious to have the calculus removed; and the general opinion was that, if the operation of lithotomy were to be performed at all, it should be done at once, though the case was grave and unpromising. It was not suited for lithotripsy, on account of the hard nature of the stone.

The lateral operation was decided on, and performed in the usual manner, occupying four minutes, some delay being experienced in finding the calculus on entering the bladder. The calculus resembled the pointed end of a gum elastic bougie, having been apparently moulded by the ureter. It was partially increased by a phosphatic deposit, the remainder of the surface having a polished coppery, metallic lustre. It measured $1\frac{1}{2}$ inch in length, and was one-third of an inch in diameter. It was composed of uric acid.

His temperature fell after the operation to 98.7, and he progressed satisfactorily till December 26th, when intense febrile symptoms set in. No cause could be found for this, as the condition of the wound was satisfactory, healing from the bottom, and urine passing through it. He now steadily lost ground; his appetite failed; he became greatly emaciated; the temperature varied from 102 degs. Fahr. to 104 degs. Fahr., and the pulse from 100 to 130.

On the morning of January 4th, 1874, he expressed himself as feeling somewhat better. His pulse was 100, and his temperature 101 degs. Fahr. Towards evening, his symptoms became greatly aggravated; he had several rigors; his temperature rose to 103, his pulse to 104, while his respirations were 44 per minute. For the first time since the operation, he now complained of slight tenderness over the site of the original tumour, but there was no pain on deep pressure. On the 5th, he was much worse; the rigors had recurred, and most profuse diarrhoea and perspirations came on. He lay on his back with his legs drawn up, though there was still no pain on deep pressure; his abdomen became tympanitic, and he gradually sank, expiring at 10 P.M. He was conscious to the last.

POST MORTEM APPEARANCES.—*Abdomen*.—There was a quantity

of sero-purulent fluid in the peritoneal cavity. Flakes of recent lymph coated the coils of the intestines and other viscera. On separating the coils from the right lumbar region, a purulent collection, situated at the upper end of the right kidney, was set free. *Kidneys and Bladder*.—The right kidney was coated with thickened lymph externally; its measurement after dissection was 8.9 inches in length by 4.3 in breadth. On section, it was found to be excavated with sacculi, no normal texture remaining. One very large sac, about four inches in diameter, projected from the upper end. The walls of this were thin, and in two places had become perforated, hence inducing peritonitis. The infundibulum of the kidney was enormously dilated; the mucous membrane of the ureter was thickened, granular, and vascular. All the coats of the ureter were greatly thickened to nearly half an inch in diameter. Six inches from the kidney, the ureter was occupied by a calculus; above, it was pouched. This pouch contained two more calculi, and measured one inch and a half in circumference. At the lowest calculus, there was a ring of ulceration three-eighths of an inch in depth, and with a very unhealthy aspect; hence, from the kidney downwards, the ureter was pouched as far as the impaction of the lowest calculus. In the pouch and sac of the kidney there was purulent fluid. The left kidney was congested, otherwise normal. The bladder was comparatively healthy. The wound of the operation was closed and healthy throughout.

THE RELATION BETWEEN ARTERIAL TENSION AND ALBUMINURIA.

By GEORGE JOHNSON, M.D., F.R.S.,

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I HAD intended to be present at the reading of Mr. Mahomed's paper at the Royal Medical and Chirurgical Society, but unfortunately I was detained elsewhere. I have now read with much interest the abstract of the paper and the discussion thereon in the *JOURNAL* of May 2nd, and I beg permission to make a brief comment on one or two points.

Mr. Mahomed's clinical observations show that in certain cases of scarlet fever there is a condition of high arterial tension before the occurrence of albuminuria. This is believed by the author to indicate a poisoned condition of blood. I have always maintained that the albuminuria and the renal disease frequently complicating scarlet fever are results of blood-poisoning, and it is especially interesting to me to find in Mr. Mahomed's paper additional evidence in favour of that doctrine. But the statement that the albuminuria and the renal disease are due to "congestion under high pressure", appears to me questionable; and, if I could have been present at the reading of the paper, I should have asked the author for an explanation of his views on this point. I assume that the increased arterial tension is a result of contraction of the terminal muscular arterioles, excited by a morbid condition of blood; but I do not see how this arterial tension explains the albuminuria. We know that increased pressure on the walls of the Malpighian capillaries, consequent on the impeded return of blood through the veins, in cases of valvular disease of the heart, for instance, is a common cause of albuminuria; but undue contraction of the renal arterioles excited by morbid blood would tend to lessen capillary engorgement in direct proportion to the increase of arterial tension to which it gives rise. In the April number of the *Edinburgh Medical Journal*, Dr. Begbie has published a very interesting paper on the Association of Albuminuria with Vascular Bronchocele and Exophthalmos. Two of the cases whose histories are given in that paper, I had, through the kindness of Dr. Begbie, the opportunity of seeing. Dr. Begbie explains the albuminuria in these cases by the engorgement of the Malpighian capillaries, which results from a want of tonicity in the afferent arteries, the congestion being increased periodically by the afflux of blood which takes place after the ingestion of food. This explanation appears to me reasonable and intelligible; but the condition of the vascular system which exists in these cases of exophthalmic goitre is the exact opposite of that which Mr. Mahomed describes in the prealbuminuric stage of scarlet fever. In the one class of cases, there is diminished arterial resistance, and a consequent increase of capillary engorgement; while in the other there are increased arterial resistance and tension, and, *pro tanto*, diminished pressure on the walls of the capillaries. It is intelligible that albuminuria may result from engorgement of the Malpighian capillaries consequent on an impeded return of blood through the veins, or an increased afflux through unduly relaxed arterioles; but it is difficult to understand that albuminuria can be a direct mechanical result of increased arterial resistance and tension, and still more difficult to explain in this way the desquamation of renal epithelium and the other phenomena which occur in cases of acute Bright's disease.