circulatory and respiratory system leads to urgent dyspnoea; but we must not dwell upon this subject. Again, in simple gastric disease, we find that the afferent branches induce disturbance of the origin of the pneumogastric, which is expressed in the pulmonary branches, and there is truth in the assertion that a cough is "stomach cough"; too often, however, the gastric disturbance associated with a dry and hacking cough is itself, as we shall have to mention, the effect of disturbance of pulmonary branches of the pneumogastric by tubercular deposit, and not the cause of the cough. A stomach-cough is a very doubtful symptom in delicate patients, and one that should be watched with extreme care. In gouty subjects, and also in syphilis, in ague, and in remittent fevers, we have modifications of action of the respiratory nerves, and conditions are produced which are very different from ordinary inflammatory disease, and their causes require to be recognised, otherwise they baffle the practitioner in the treatment of them. In this way, iodide of potassium becomes a most important remedy for syphilitic bronchitis, if I may use such an expression, and quinine and arsenic are of great service in the severe asthma that is sometimes observed in aguish districts.

The conditions that are produced by *paralysis* of the pulmonary branches of the *par vagum* closely resemble those observed after experimental division of the nerve. We may take one or two instances to illustrate this fact, and we would premise by stating that this paralytic condition may be of *central* origin, or it may be due to local or to reflex influence. In reference to the first condition, the medulla oblongata and the origin of the nerve at the floor of the fourth ventricle is directly affected in severe apoplexy, in such cases as *in*gravescent apoplexy, when a clot has broken into the lateral ventricle, and the blood has passed onwards into the fourth ventricle, or, again, in apoplectic effusion into the pons Varolii. The respiration becomes very slow; one or two deep inspirations are followed by several slight and more shallow ones, then to be compensated for by a full and deep act. The lungs become congested, there is serous effusion into the air-cells, and a form of broncho-pneumonia is produced, if life be prolonged. In poisoning by opium, almost a similar condition is observed. This paralytic state of the pulmonary branches may, however, be the result of a *local* cause, as a severe chill affecting the extreme branches of the *par vagum*. Scarcely a winter passes—we might say no winter passes by—without many persons thus becoming struck down almost at once, especially in the extremes of life, the aged and the young. Sometimes the attack is spoken of as a mere cold or catarrh, but the shock is so great that the patient is unable to rally, bronchitis or pneumonia is almost at once produced, it may be without cough, and the patient quickly becomes prostrate. In a very few hours patients thus pass away; unless, perchance, by powerful stimulants, such as brandy, ammonia, ether, etc., there is a quick invigoration of these important nerves and centres. One other reference to this paralytic condition, in this instance due to reflex action. It is very common at the close of organic disease of the stomach and of the uterus to find that patients have broncho-pneumonia, and that this appears to exhaust the last spark of life; this condition may be quite independent of septic change and of alteration in the blood, but it is produced by the gradual exhaustion of nerve-power, until, at length, the respiratory act is inefficiently performed, and the least irritation suffices to produce these inflammatory changes in the lung-tissue. Sometimes, by watching the gradual progress by which life is fading away, we may for a short time retard dissolution and prolong life.

[To be continued.]

CASE OF SUPERNUMERARY TESTICLE.

THE following case of malformation is worthy of record as being rare. A private of the 4th Battalion Rifle Brigade, on being examined for transfer, was found to possess three testes, two of which were situated in their normal position, and were of moderate size, whilst the third or supernumerary testicle was situated about an inch above the testicle of the left side, midway between it and the external abdominal ring, and well in the sac of the scrotum. The two glands were distinct, and movable independently of each other. The supplementary gland was firm, elastic, and about the size of a nutmeg; and pressure produced a sensation similar in it both to the patient and to the fingers as that occasioned by squeezing either of the other two. The vessels, etc., of the two glands on the left side united to form a single spermatic cord above the smaller gland, in which, on manipulation with the fingers, two of its constituents, of firmer feel and structure than the rest, could be isolated, being most probably the deferent ducts of the glands. This state of things had existed since the man's earliest recollection. There was no complaint of inconvenience.

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THE CROONIAN LECTURES ON THE PATHOLOGY AND RELATIONS OF ALBUMINURIA.

Delivered at the Royal College of Physicians.

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LECTURE II.

THE alterations in the structure and tension of the arteries which, in my last lecture, I described as belonging to the granular degeneration of the kidney, supply the key to some of the more important secondary lesions which attend the disease. First, as most obviously associated with them, may be placed the *retinal disorder*, whether exudative or hæmorrhagic, which is so closely connected with the granular kidney, that if "albuminuric retinitis" be recognised with the ophthalmoscope, this type of renal disease may with but a small percentage of error be assumed to exist. But that the association is not invariable has been shown by the examples—rare though they be—in which the condition has been linked with the white smooth kidney of diffuse nephritis.

There is a transient blindness which comes on sometimes with other signs of uræmia in any condition from which uræmia can spring. This has been well described by Dr. Clifford Allbutt in his work upon the ophthalmoscope, in which he teaches us to look upon the retina not only as part of the machinery of sight, but as displaying upon its mirror, as if by some process of natural magic, the diseases of concealed structures and remote organs.

This form of uramic blindness, connected possibly with a toxic embarrassment of the intracranial organs of vision, gives no sign of which the ophthalmoscope can take note; nor has it any especial connection with the type of renal disease under consideration. Dealing only with visible and retinal changes, these are complicated by hyperæmia, serous infiltration, hæmorrhage, and, sooner or later, striking white spots, in regard to which there is some difference of opinion as to how far they are the mere records of past hæmorrhages, and how far they are the independent results of degeneration of tissue. These injuries are variously intermixed; they all originate alike in arterial leakage, whether from the increased blood-pressure, or from the deterioration and abnormal perviousness of vessel which are constantly present with the form of renal disease under consideration. Of these changes, which are conveniently spoken of together as *albuminuric retinitis*, the hæmorrhagic patches and white spots when together are characteristic. They are but the visible signs of a disorder which is as wide as the arterial system, involving not only conditions of arterial distension and degeneration, but almost as surely of cardiac hypertrophy and renal failure. This optic state is of great interest clinically. It must generally be accepted as evidence of advanced disease, though often of disease which as yet has had no result in dropsy, or given any other intimation of its existence which is understood of the vulgar; but has crept on in the subterranean fashion belonging to the granular kidney, and not struck the surface until after a long course it has reached the retina. Perhaps the most rapid form of renal disease which is apt to be thus accompanied, is the albuminuria of pregnancy; this, leading as it does to granulation, is more liable perhaps than any other form of albuminuria to acquire the retinal complication.

It would be of interest, were it practicable, to state how frequent are the exceptions to the general rule that retinal hæmorrhage denotes renal granulation; the rule is supported by hundreds, where the exceptions are counted by units. But they are enough to show that there is no necessary pathological connection or identity of kind between albuminuric retinitis and the granular or cirrhotic kidney, but that the retinal is only an expression of a state which, though most frequent with this form of renal disease, is not peculiar to it. The later stages of both the nephritic and the lardaceous kidney may be thus accompanied.

And in other organs and by other modes the same hæmorrhagic bias is evinced; most importantly within the *brain*. The very frequent concurrence of the granular kidney with sanguineous apoplexy is too familiar to need assertion in this place. With

a ventricle of abnormal strength, arteries full to repletion, and at the same time weakened by the process of fatty destruction which so often ensues upon or goes with the other albuminuric changes, it is little to be wondered at that they should not only leak but rend. At least two-thirds of the instances of extravasation within the cranium which are fatal in London, are accompanied with the form of renal disease under consideration. A striking fact, one which shows how directly the hæmorrhagic is connected with the renal mischief, is the occasional occurrence of cerebral extravasation even in childhood, where the kidneys are granular. An instance will be presently mentioned, in which a child of twelve died from a large cerebral hæmorrhage of renal origin; and, I believe, that most of the instances of the apoplexy of early life when not embolic are of this nature. Discharge of blood in less injurious modes under the skin, or from free surfaces, also marks the course of the disorder. This occurs, though infrequently, from the stomach, the lung, or bronchial membrane, and from the uterus. From the nasal cavities it happens often, inasmuch that severe or repeated epistaxis in middle or advancing life, must always raise a suspicion of renal fibrosis.

To complete the catalogue of secondary lesions which follow in the wake of granular degeneration, we pass from the hæmorrhagic, which are the especial property of the disorder, to the inflammatory; which, though far less frequent on the whole than with the more rapid forms of renal disease have yet, as touching some structures, especial association with it. In this regard, pericarditis stands first. In a series of cases, about a fourth—sixteen in sixty-eight—displayed this lesion in a recent state on *post mortem* examination. The inflammation is generally confined to the outside of the heart; and, though much less declared in its symptoms and far less often accompanied with considerable serous effusion than is the pericarditis of rheumatism, it is as generally fatal, as the rheumatic form is usually free, from immediate danger.

Inflammations of the respiratory organs occur with the chronic as with more acute disorder; bronchitis as proper to advancing years, and as often associated with gout, is more common with the former as seven to four. On the other hand, pneumonia, pleurisy, and, it may be added, peritonitis, are none of them half as frequent with the granular as with the smooth kidney. As to a more rare complication of the complaint—if, indeed, it is to be regarded in this light—is a condition of ulceration of the lower end of the small bowel, unconnected either with typhoid or tubercle, and not to be accounted for otherwise than by supposing it related in some manner to the renal disease. This condition has come under my notice but in two instances, one of which I shall presently relate in detail. The ulcers in both had nearly penetrated the bowel and set up localised peritonitis. The condition was like that of dysentery save in its situation. It was attended in both patients with vomiting, distressing and persistent, beyond the wont of simple uræmia, and with intestinal or colicky pain, and abdominal tenderness.

As bearing upon the morbid associations of the granular kidney, I shall relate two of those rare instances of the disease of which children are the subjects. Their necessary freedom from the deteriorations of age, and in the general simplicity of their diseases, patients of this class are especially useful, as sources of information upon matters which are liable to gather complications as years advance and morbid and senile changes accumulate.

Charles Dodd, aged 14, a boy, with a wizened face and a parchment skin, applied at the ophthalmic department of St. George's Hospital in consequence of a failure of sight; and was thence remitted to medical care. For three years, he had suffered from headache and vomiting, symptoms which had been formerly supposed to depend upon a tumour in the brain. His complexion, however—the characteristic *pallor lutus*—and the absence of paralysis, or lateral inequality of muscular action, led to a suspicion of renal disease, which was verified by finding the urine excessive, pale, of low specific gravity, and with a trace of albumen. There was no dropsy, nor ever had there been. It was ascertained that the boy had had weak health since he was crushed for stone at the age of three. The cardiac dullness was increased. Not to follow the particulars of his illness, the only peculiarity of which was abdominal pain, attributed by the boy himself—he had served a butcher—to a “a twisting of the guts”, and attended with much nausea and vomiting, he died after an attack of convulsions.

The kidneys were both covered with well marked hemispherical granulations, but in size they presented much inequality, the left weighing three ounces and a half, the right but seven drachms. The pelvis of the smaller, together with the upper part of the ureter, was dilated as if by a bygone obstruction. Microscopically, the characters of both were the same; masses of shrunk or compressed tubes imbedded

in a copious formation of interstitial fibroid tissue, penetrated in masses wedgewise from the surface. The left ventricle of the heart was enormously hypertrophied, its walls nearly one inch in thickness; while the interior was practically healthy, only a few specks of athroma testifying to the contrary. The arteries of the pia mater were greatly thickened both in their muscular and fibrous walls, dotted with oil and irregular in contour. To complete the morbid appearances, it must be added, that the lower two feet of the small bowel were deeply excavated by the peculiar ulcers, of which I have spoken, neither tuberculous nor typhoid, generally linear, following the valvule conniventes around the intestine. A small quantity of semipurulent fluid was found in the peritoneal cavity.

I will pass from this case without remark to the next. Emily Tillet died at the age of twelve, at the Hospital for Sick Children. She had long been subject to attacks of headache and vomiting. For one of these more than ordinarily severe she was admitted. She had walked from her home to the hospital, and upstairs to bed. In the evening, she was noticed to be in a condition of much excitement, crying and throwing herself about. In the early morning, attention was drawn to her cadaverous pallor; the breathing was irregular, the action of the heart tumultuous. Upon this, she rapidly became comatose, and in half an hour was dead.

The kidneys were unequal in size, the left weighing two ounces, the right but half an ounce. The capsules of both were adherent, the surfaces roughened, and uneven though not definitely granular. The cortices were atrophied, the pelvis of size more than due to the atrophied glands, though not positively dilated. The mass of both kidneys largely consisted of a profuse growth of nuclear fibroid tissue in inseparable connection with the matrix of the organ of which, indeed, it was but an exaggeration. The new tissue was often seen in stellate masses lying at the junction of several tubes, and insinuating its processes between them. The arteries were in close relation to this nuclear formation, and were generally thickened. Where the growth existed in bulk, it had acquired to itself a regular system of capillaries which, though of inappreciable thickness, could be easily traced by the blood-corpuscles within them. The tubes were variously separated, compressed to threads, and irregularly dilated. It is to be observed that, with the granular degeneration of childhood, the disease is more rapid and characteristic, the new growth more abundant, more active, and more encroaching, than when the subjects of the disease are older. The active nutrition of youth is imparted also to its diseases. In this instance, the condition of the renal cirrhosis, as it has been termed, were displayed with an almost diagrammatic point; and the associated changes were equally declared. The heart weighed eight ounces and a half, the left ventricle was enormously hypertrophied, the valves natural. The arteries of the pia mater were most irregular in contour, those above the smallest thickened in both coats; others, smaller, nearly transformed by fatty degeneration.

A recent clot as large as a goose's egg was found in the posterior lobe of the left hemisphere; it reached from the superficial pia mater to the outer wall of the lateral ventricle, both of which had been slightly torn.

To these instructive instances of what may be termed precocious granular degeneration, I might add two others, one in a boy of eleven, in whom the disease had succeeded upon scarlatina; one in a girl of five years and eleven months, the earliest instance I have seen, whose organs I was enabled to examine by the kindness of Dr. Barlow of Manchester. In both cases, the kidneys were in a state of characteristic granular contraction, with much thickened arteries; in both there existed cardiac hypertrophy, and in the boy, in addition, extensive retinal hæmorrhage.

[To be continued.]

THE COLD-WATER BED AS A THERAPEUTIC AGENT.—The cold-water bed as a new method of reducing temperature is recommended by H. D. Felton, in the *New York Medical Record* of October 3, 1875. In the case of a patient in the fourth week of typhoid fever, whose temperature was 103.5 deg. to 104 deg., Dr. Felton made use of a water-bed constructed from an India-rubber air-mattress, with inlet and outlet at opposite ends, to which he coupled an India-rubber hose, one pipe being attached to the aqueduct faucet and the outlet conveying the water from the house. His patient lay upon the bed eighteen days, the water being renewed every five hours. It was found that at the time when the temperature of the atmosphere was 62 deg., and that of the hydrant water 68 deg., the water in the bed, after remaining unchanged seven hours, was 79 deg., an increase of 17 deg. over that of the atmosphere, and of 11 deg. above that of the aqueduct water; therefore the patient imparted 11 deg. of heat to a barrel of water in seven hours, and still his temperature remained at 102¾ deg.