

the last pair of valves, it is the time relations which determine the significance of the pulsation. If presystolic and systolic, or systolic only, we are dealing with a pathological state marked by a full auricle which transmits backward the ventricular stroke. The sufficiency of the venous valves thus has little more than an accidental value, though no doubt insufficiency, especially of the internal jugular valves, marks the severer cases of right heart congestion.⁹ But

⁹ Consult Struthers (op. cit.) on this question of venous valve sufficiency.

we know that such pulsations will depend for their force upon the vigour with which auricle and ventricle contract. We shall hence not be surprised if an over-distended auricle paralysed by this very distension ceases to give rise to any notable movement in the vein, and the like, though much less commonly and of much more serious significance, may obtain for the ventricle. The over-full auricle will in such case be there, but the force to be transmitted will be wanting. Then, too, shall we not expect cases to occupy a borderland position between the pathological and physiological states?—e.g., in a case of anæmia, whose full veins in the recumbent posture point to a full right side of the heart, is it not more than likely that this fulness may nullify the effect of the auricular diastole, the auricle having been unable to more than partially discharge itself of its burden into the ventricle during its own auricular systole? Towards this nullifying effect the tricuspid recoil will contribute. May we not, indeed, expect that in certain of these cases of anæmia the over-full ventricle may actually in part discharge itself backward through the inefficient valve, and not merely nullify the effect of the auricular diastole, but replace its negative effect by a positive regurgitant wave and beat? These borderland cases, however, do not in any way invalidate the value, clinically, of establishing, where possible, the time relations of venous pulsation.

THE ULCER OF THE EMIN PASHA RELIEF EXPEDITION.

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THE most formidable pathological obstacle to the success of the "Stanley Expedition" was the terrible plague of ulcers from which all of our coloured carriers suffered more or less seriously, and which even victimised some of the white officers, although in a slighter degree.

I saw little of this form of disease till after we had left Yambuya (our base where the steamers landed us), and struck into the dense primeval forest, which still occupies the central area of the African continent. There the mechanical obstacles which nature had imposed along our line of march, the permanent exclusion of the sun's rays, the stifling atmosphere reeking with vapours exhaled from the decomposition of enormous quantities of rank vegetable matter, the physical depression produced by prolonged and wearing muscular exertion without an adequate supply of food, the mental depression consequent upon the apparently hopeless character of the task which had been set before us, all combined to lower the physique of our men to an extreme degree. Under these circumstances, the scratching of the smallest papule, the bite of a flea, a louse, an ant, a tick, a "jigger," the more impressive attentions of a mouse or rat, the sting of a hornet, the puncture or scratch of a thorn, the abrasion of cuticle produced by a rub against a projecting stump or branch of a fallen log or sharp-cornered stone, or the vicious puncture of one of the wooden spikes (*makonga*) which the watchful natives placed in the pathways as we approached their villages—any one of these agencies produced a breach of continuity of the surface which not only made no attempt at spontaneous repair, but formed the centre of a rapidly-spreading ulcer. As the lower extremities were mostly exposed to small injuries, and are placed by nature furthest from the centre of circulation, the necrobiotic process displayed there its most destructive ravages. When our privations were at their maximum, a spot which had received some slight friction or irritation was soon distinguished by the seat of a bulla or vesicle, from which, after the cuticle had given way, the destructive process rapidly radiated. The subsequent history resembled in the worst cases that of hos-

pital gangrene. Rapid phagedænic ulceration spread from the seat of origin of the disease; the soft parts all yielded in succession, but some much more slowly than others. An ashen-gray slough covered the affected surface; the skin and subcutaneous tissues rapidly disappeared and exposed the sheaths of the muscles; the muscular tissue itself decomposed more slowly; the nerves and arteries were destroyed only after a prolonged resistance, and could be plainly seen lying on the floor of the excavated space; the tendons, which soon lost their muscular attachments, hung about in shreds, and sometimes trailed along the ground as the unhappy victim dragged the diseased limb slowly and painfully along. The bone was attacked when the soft parts had yielded and exposed its periosteum, and after the disappearance of the latter the superficial layers of osseous tissue always underwent a process of exfoliation. As will be easily understood, the treatment of these ulcers was, during the progress of our march, extremely difficult and extremely unsatisfactory in its results; and the endeavour to limit their ravages while I had little or no means of improving the physique of the victims, or of ameliorating the hygiene of their condition and surroundings, was depressing in the extreme. As we all dragged our weary limbs through the trackless forest from the southern bank of the Aruwimi till we reached the Manyema camp at Ipoto, the progressively increasing inanition reduced almost every individual in our ranks to a condition in which he was able to do but little for himself, except what he was compelled to do by the direst necessity, and next to nothing for the general welfare of his suffering comrades. The circumstances were, as can well be imagined, to the last degree unfavourable to therapeutics. The regular dressing and bandaging of each affected limb, although every available hour after the completion of the daily march was devoted to it, soon became a physical impossibility. I also encountered a good deal of obstinacy on the part of our carriers, who, like other aboriginal peoples, had their own primitive remedies, to the use of which they were for a considerable time disposed to cling tenaciously. I must, however, add here that the observation of the effects of better treatment, when they had had sufficient opportunity for forming an opinion, weaned them all thoroughly from their inherited faith in the native methods of cure.

When the starvation period was at its climax, the treatment of ulcerated surfaces went for little. The influence of antiseptics failed to keep pace with the decomposition of the dying tissues. Caustics merely laid bare a deeper stratum, which was rapidly attacked by the phagedænic action, and it was disheartening to the last degree to watch them day by day—to feel so powerless in the presence of these gigantic opponents, famine and disease. Whole feet and legs were destroyed in a great many instances. A slight abrasion or accidental scratch established a solution of continuity of the cutaneous surface, perhaps a little above the ankle. From this starting-point the ulcerative process proceeded upwards, downwards, and laterally. The lower end of the tibia and fibula became exposed, the tarsal bones were in their turn laid bare, and as the disease progressed the destruction of the tissues became so complete as to sever the connexions of the latter, and also of the metatarsals, so that the bones of the foot, protruding in a necrotic condition, dropped out one by one on the line of march, or were, when almost quite detached, picked out and thrown aside by the unhappy owner after he had reached the camping ground.

These terribly destructive processes were seen on a still larger scale during Mr. Stanley's return march from Yambuya, after picking up the remnant of the "Rear Column." A terrible period of starvation was encountered during the couple of weeks before they reached Fort Bodo, and one of the most vivid recollections of my life is the ghastly display of ulcerated and gangrenous surfaces which our poor Zanzibaris displayed on filing into our camp. When the opportunity was furnished, by rest and good food, the ulcers of all those whose systems had not been wholly undermined by the hardships to which they had been exposed healed up rather rapidly and completely under simple treatment; but many of them, while healing over the greater part of the circumference, would be simultaneously breaking down and extending rapidly at other points of the margin. Careful washing and bandaging, with the use of a little antiseptic application from my small store, sufficed for the more superficial lesions under the comparatively favourable conditions of our sick camp at Kandekoré. The small quantity of potassium permanganate which I had then left was

always used with good effect. When the diminution of my stock forced me to be very parsimonious in the use of my drugs, I resorted to the gunpowder of my cartridges, the application of which I found beneficial beyond my expectations. For the deeply eroded tissues which had been the seat of extensive phagedænic ulceration, the application of pure carbolic acid succeeded rapidly and perfectly, especially when the ulcer was situated on the sole of the foot. Its caustic action soon separated the dead from the living tissues, and the latter speedily developed a healthy granulating surface, which cicatrised without further delay, leaving a depression; and in the case of the white men an indelible pigmentary patch invariably remained.

The Zanzibari and native African have wonderful healing power, and appear to recover from lesions of great extent much more rapidly and completely than do white men. It must be remembered that, as there was little or no means of transport, the unfortunate sufferers were constantly on the march, except in a few instances when they were left at standing camps. It was fortunate for them that comparatively little pain was experienced. The mental apathy produced by the hardships and consequent physical depression, which was the great predisposing cause of the appearance and growth of these gigantic ulcers, was accompanied by the local anæsthesia induced by the early destruction of the sensory nerve-endings. This peculiarity was almost daily demonstrated to me in the most ghastly fashion during our residences at the standing camps of Ipoto and Fort Bodo.

The sufferers from the most extensive and deeply excavated ulcers were visited every night during sleep by hosts of rats, from whose advances they were unable to shut themselves in completely. These detestable parasites gnawed at the surface of every ulcer which was not completely covered, and morning after morning I was shown limbs on which the mischievous rodent had gnawed its way under the edge of a loosely-applied bandage, and had completely burrowed a track into the diseased tissues of the edge of the ulcer before the unhappy patient became conscious of its presence! These were trying experiences both to patient and medical attendant. May none of us meet with the like again.

Netley.

ON THE

USE OF TURPENTINE IN THE TREATMENT OF RENAL CALCULI AND GALL-STONES.

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THE physicians of the seventeenth century undoubtedly employed turpentine, and apparently often with good results, in the treatment of renal and biliary concretions. It, moreover, seems to have been a popular remedy as well, since we find the great diarist, Samuel Pepys, records the fact of his taking that remedy during the winter of 1664, dividing the credit of his "good plight" between his hare's-foot¹ and taking every morning a "pill of turpentine." With the increase, however, of medical science and the general adoption of solvent remedies, the employment of turpentine for the relief, as far as renal concretions were concerned, was so entirely abandoned that quite early in this century Dr. Henery of Manchester² brought forward a case in which the discharge of a considerable number of uric acid concretions followed a dose of turpentine and opium as being something novel. For the treatment of gall-stones, however, turpentine remained in favour till almost recent years, especially in France, where the famous remedy of Durande, consisting of a mixture of one part of sulphuric ether to two of turpentine, was much in vogue, till Trousseau³ exposed the fallacy of believing that a mixture of ether and turpentine could exert a solvent action on a concretion in the gall-bladder, in the same manner that it might do so in a test-tube. Nevertheless, so highly did this distinguished clinical physician regard the action of this drug, whether due to solvent principles or not, that he

based his plan of treatment on a combination of the use of alkalies with that of turpentine, advising, however, that the latter should be administered in capsules, instead of in the form of Durande's elixir. With these facts in view, I feel that but slight apology is needed for bringing before the profession some cases which illustrate the value of this old remedy for calculous disorders, and supplementing a few remarks as to its mode of action in bringing about certain well-defined results.

First, as regards its use in the treatment of renal calculi. The great advance that has been made of late years in surgery, especially as respects operations on the abdominal viscera, has much assured the mind of the medical attendant as to the ultimate relief of the patient; so that the alternative of an operation, in itself not much more hazardous or difficult than lithotomy, can always be resorted to in case of our failing to remove the concretion by more persuasive means. Nevertheless, however effectual and unattended with hazard an operation may be, still it is only fair to the patient in every case to resort to a fair trial of simpler measures before having recourse to the knife, and this ought to be especially the case if we suspect the formation to be of recent origin. Besides this, other reasons may present themselves: such, for instance, as the impaired health of the patient rendering the operation more hazardous than it otherwise would be; or the fact that the constitutional tendency to form these concretions is fixed, as instanced often in elderly persons, who pass periodically that specially recurrent form of calculus, "pisiform," for long periods of time, and which, unless otherwise relieved, would subject them to continued surgical interference. It is therefore in cases where we have reason to suspect that the concretion is of recent origin, or when the patient's health is much broken, or when the tendency to the formation of stone is so marked that the relief afforded by surgery would have to be frequently exercised, that we ought to give a thorough trial to other means.

The object, then, of the administration of turpentine, in conjunction with so-called solvents, diuretics, &c., is (1) to assist in the expulsion of any concretion already formed, and (2) to prevent the formation of others.

The first experience I had of the value of turpentine occurred some years back, in the case of a gentleman who for nearly two years had been subjected to the "solvent treatment," and who, after several months of that treatment, began to pass small fragments of calculous matter, and to suffer greatly from frequent attacks of renal colic, as if the stone was making efforts to pass. At the same time there was much hæmaturia, and a considerable quantity of pus was discharged with the urine. For the relief of the hæmaturia and to diminish the pyelitis turpentine was prescribed, with the effect that in a short time an oat-shaped calculus was expelled. This concretion was a mere shell of what had evidently been a solid calculus. I showed it at the Pathological Society (1882) as an evidence of what might be effected by the disintegrating action of soft water and by the chemical action of alkaline remedies. At the time, however, I paid little regard to the action of the turpentine in hastening the expulsion of the concretion.

Shortly afterwards my attention was more especially drawn to this point in the case of a gentleman who was sent to me by Mr. Tweedy, and who for some years had suffered from gout and gravel. He had passed at times numerous small concretions without much difficulty, till at last one much larger than usual refused to descend, and which gave us much trouble. At last, after three months of more or less suffering, in order to diminish the hæmaturia and pyelitis I ordered him to take some small doses of turpentine, which were quickly followed by the expulsion of a fair-sized uric-acid calculus. I then began to credit the drug with having a decided expulsive action, and I also thought that if it had that power in bringing away a fully formed concretion, it might ensure their expulsion before becoming completely developed, and therefore save a patient who suffered from recurrent attacks from a tendency to form pisiform calculi, from the pain of passing them when they had attained a more considerable size. I therefore directed this patient to take at stated intervals a few doses of turpentine, with the result that, though for some years previously he had passed annually small concretions (generally in the autumn), from the time he commenced the systematic use of turpentine as I suggested he never again passed gravel in a concrete form.

Another case, illustrating both the expulsive as well as the preventive action of turpentine in the treatment of renal

¹ An old charm against colic. Pepys suffered much from calculous disorders. He was cut for stone in 1658, and after his death in 1703 his kidneys were found much disorganised by calculous concretions.

² Royal Medical and Chirurgical Society's Transactions, vol. x.

³ Clinical Lectures, vol. iv., Sydenham Society's Translation.