

Hospital for the second time in November last. He was discharged from the army in 1851, after an attack of "inflammation on the chest". Previously to this, viz., in 1849, he suffered from pleurisy; and when he recovered, he noticed his heart beating "on the wrong side". The surgeon who attended him used frequently to measure his left side, which gradually enlarged. In the autumn of 1850, his breathing was much affected, and his chest was tapped; 110 ounces of clear fluid being taken away. Five weeks later, 86 ounces were removed. A year after, when recovering from an attack of rubeola, 124 ounces were taken away; in another year, 90 ounces; and twelve months later, the same quantity. The last operation was performed in February 1854, when another 90 ounces were withdrawn.

He came in suffering from slight bronchitis, from which he soon recovered; and, although he had made up his mind to undergo another operation, yet the comparative freedom of his respiration led Dr. Wilson to advise its postponement until more urgent symptoms should arise. He therefore left in the course of two or three weeks. The girth of his chest, which in the summer had been forty-one inches, was reduced to thirty-six inches, as was discovered by the tailor who measured him for a coat prior to his admission. When he went out, the measurement was not more than thirty-five inches.

CASE IV. Under the care of W. E. Page, M.D. G. C., a blacksmith, aged 37, who came in on December 1st, had pleurisy three years and a half since; and great bulging of the left side and constant dyspnoea followed the attack. In five months he was tapped, and 66 ounces of clear fluid were removed; two months later, 156 ounces; three months after this, 96 ounces; in four months, 95 ounces; and finally, in December 1854, 65 ounces. From this date up to the time of admission he had been constantly at work; only making complaints of "fluid rolling about in his chest" when going up-hill or up-stairs.

The heart was pushed somewhat over to the right; and there was a difference of about three-eighths of an inch between the two sides. His tongue was coated; pulse quickish; face a little flushed; and respiration slightly hurried. In a day or two these symptoms vanished; he said that he felt quite well; and suddenly took it into his head to depart.

However, on January 28th, he again made his appearance, complaining of increased dyspnoea, and giving an account of some "inflammation on the chest" during his absence from the hospital, which attained its height towards the close of the first week in January. The cough and expectoration had not by any means abated, although the breathing was tolerably clear on the right side.

On February 7th, when the ear was applied just below the left scapula, a distinct metallic ring was audible on succussion. He still remains in the house; and, after taking calomel and opium until soreness of the gums supervened, he has been put upon iodide of potassium three times a day, and a morphia draught at bedtime. The heart is pushed a little over to the right; the affected side measures eighteen inches; the healthy one nineteen. He complains most of a burning pain at the lower part of the left side, and a sensation of faintness after succussion has been tried.

The case may subsequently afford matter worthy of a more extended report; at present, the chief point of interest is the metallic ring on succussion, indicating the presence of air in the pleural cavity. The sound, however, cannot be obtained by simply making him cough or speak; widely different from Case II, where the signs of pneumothorax were so well marked. That the communication with the external air was caused by ulceration and perforation of a bronchial tube during his late inflammatory attack, there can be little doubt; for when he was a patient in December, no splash of fluid in the chest was heard.

REMARKS. The two cases of hydrothorax here brought forward exhibited great bulging of the affected side, quite as marked as in any case of empyema—perhaps, more so. In many other instances of serous effusion, the same obliteration of the intercostal *sulci* has been observed; and it really does not seem very easy to explain what some writers mean when they speak of this dilatation of the chest as a condition peculiarly appertaining to purulent effusion. Great enlargement of the side, which contains a collection of pus, is exemplified in Case I; but in Case II, where there was also a difference between the two sides of the chest, the contained air must have had much to do with the distension of the left side. In this latter case, had time been afforded for puncturing the pleura, the relief would only have been temporary. With tubercles in

the lungs, the man must have sunk; but even had phthisis been absent, and the case progressed favourably, it could not have been set down as a *perfect cure*, if we are only to reckon as recoveries "the instances in which there is a perfect return of the affected side to its normal shape and capacity". Some deformity must have remained; for with a band of lymph stretching from the pulmonary to the costal pleura, such as was discovered after death, the dragging in of the parietes of the chest would have been considerable. If absence of contraction is the criterion of *cure*, then we must exclude Case I from the category. Yet, had cholera not seized upon the patient, there can be very little doubt, notwithstanding his broken constitution, that he would have gone out ultimately in comfortable health. And the very fact of an habitual drunkard, who had not one, but many, diseases to contend against, so far recovering, is a forcible warrant for rejecting the idea of the great danger of paracentesis thoracis; and adds another instance to those already adduced by Dr. Hamilton Roe, in confirmation of its safety.

Original Communications.

INFLAMMATORY ACTIONS, AND THEIR TREATMENT.

By C. HANDFIELD JONES, M.B., F.R.S., Assistant-Physician to St. Mary's Hospital.

THERE is a pathological state in which, while the functional power of a living tissue is greatly lowered, or wholly arrested, its attraction for the blood is greatly increased. More of this fluid rushes to the spot through dilated arteries, reflux thither takes place through the veins, heat is considerably increased, and fibrinous exudation is poured out. This state is familiar to us all. We call it *sthenic* inflammation. It is often also called *acute*, but this term is less appropriate, because *asthenic* inflammation may run a rapid course, and *sthenic* again may be *chronic*, or slow in its progress. If the focus of disordered action in *sthenic* inflammation be extensive, or if the system be irritable, the heart's action is accelerated, and general pyrexia takes place. *Sthenic* inflammation requires that the general vital power shall not have been lowered either by preceding circumstances, or the exciting cause. I wish to lay particular stress on the part which the local attraction plays in *sthenic* inflammation. True, it is what we cannot see itself, but its existence seems to me positively determined by the following facts. There is increased arterial afflux, there is venous reflux, the red and the white corpuscles adhere to the sides of the capillaries, and do not become detached until the inflammation is subsiding. Whoever has carefully watched, in the frog's web, stasis occurring, and undergoing resolution, will be convinced, I think, that a dynamic relation between the blood and the tissue is mainly concerned in producing the phenomena observed. The existence of local attraction is also strongly evinced by the common experiment of applying pressure to the inflamed part. In *sthenic* inflammation it is ill borne, and scarcely excludes the blood even for the time it is applied. Hughes Bennett, W. Jones, Paget, Weber, Virchow, not to mention others, look upon this local attraction as the prime element in *sthenic* inflammation. I adopted this view in the *Manual of Pathology*, and will now further add, that I think the term *tissue* inflammation is in several respects preferable to *sthenic*. It specially puts forward the part played by the affected structure in the morbid process, and serves an important distinctive purpose.

The typical condition which I desire to contrast with the foregoing is *asthenic* inflammation, which in some respects might advantageously be designated *nerve* inflammation, for reasons which we shall immediately see. In this the part affected is hyperæmiated, overmuch blood being poured in through relaxed arteries; its functional power is impaired; its temperature is elevated, though less than in *tissue* inflammation; and it is often the seat of exudation. Respecting the microscopic appearances in such a state, we cannot say anything certainly, but it is probable that the arrest of the blood in the capillaries, and the adhesion of the corpuscles to their walls, would be wanting, or exist in only a slight degree. From naked eye observation, however, we are sure that there is much less local attraction than in *tissue* inflammation, the hyperæ-

miated parts are much more readily emptied by pressure, and the blood returns into them again much more slowly. If pyrexia exist, and the heart's action is accelerated, the pulse is not hard as in the former case, but yielding. Between these two states there is very much of apparent resemblance, and indeed that which positively differentiates them is only their dissimilar reaction when tested therapeutically. Thus one case of eczema, or psoriasis, will be aggravated greatly by the administration of arsenic, another will be cured quickly by it. One case of bronchitis will be greatly relieved by frequent doses of ipecacuan, another is not in the least benefited by it, but soon gets well under nitric acid and tonics. One case of pleuritis does admirably under calomel and opium, in another the same remedy is only prejudicial. Iritis, though for the most part yielding to mercury, is sometimes controlled better by oil of turpentine. The origin of such inflammations as we are considering is perfectly illustrated by the phenomena observed when the sympathetic is divided in the neck of an animal. The arteries of the part, to which the nerves divided are distributed, immediately dilate, throb strongly, are turgid with blood as well as all the vessels they supply, while the temperature rises considerably. If the animal be weakly, severe conjunctivitis may ensue with muco-purulent exudation. Stimulation of the divided nerve brings about contraction of the arteries, and cessation of the hyperemia and heat.

Now, in the case of an asthenic inflammation, when we give a nerve tonic, arsenic, strychnine, or quinine, and find the train of morbid phenomena cease and disappear, is it not reasonable to conclude that the remedy acts by stimulating the vascular nerves, and so causing the same effects as in the experiment just detailed? It may further be remarked, that in cases of this nature, the persistent tendency to congestion of a tissue which has been inflamed illustrates well the deficiency of the capillary walls in contractile power. A patch of asthenic eczema, or psoriasis, may be cured by arsenic, so that there shall remain nothing more than an increased redness of the part, effaceable easily by pressure, but returning slowly after the pressure is removed; this, however, is most slow to yield, persists long after all other trace of the disease has ceased, and forms a basis (so to speak) on which this morbid action readily recurs. The cause of this is that the arteries leading to these capillary vessels have contractile coats, which readily respond to the nerve stimulus, while the capillaries, having only walls of simple homogeneous membrane, remain but little affected. As the sympathetic plexuses do not accompany the arteries of the limbs, or but scantily, there appears a difficulty in understanding how the vaso-motor nerves of these parts are supplied. In careful microscopic examination of the fingers, I have found nerve-bands, exactly resembling those of the sympathetic given off from the cerebro-spinal nerves, and it is probably through these that the vessels are influenced. I do not, of course, doubt that the arteries are often directly contracted by cold, but the phenomena of an algid fever could not be thus explained. Though the temperature of palsied limbs is usually lowered, I have observed a case in which it was more than two degrees above the sound one. In this, the paralysis may have involved the vaso-motor filaments.

Could we always have to deal with marked typical cases of sthenic and asthenic inflammations, our practice would be very simple and clear. Annul the tissue irritation in the one case, and give tone to the vessels in the other, *et voicî tout*. But it can never be repeated too often, that types are far more rarely met with than intermediate instances, and therefore all our skill and acumen is constantly called into exercise to determine whether a given condition approximates more to the one type or the other, and to regulate our treatment accordingly. We must describe types to have landmarks, otherwise all safe proceeding would be impossible, and I by no means join with them who sneer at book descriptions and say they never meet them in practice. It is possible they may not; but every case they treat they ought to be able to refer to a position marking its approximation to one type or another. In sthenic systems, to annul tissue irritation may be all that is requisite, and it may be needless or even injurious to endeavour to tone the nerves. In multitudes, however, of weakly systems, the first of these indications is very speedily satisfied, or the time for it has passed away; and the second requires long efforts, perseverance, and management. The nerve power is weak and low, and is depressed again and again by trifling causes.

In the above remarks I have taken the case of pure and simple inflammations, not depending on the presence of any actual *materies morbi* in the blood. Among these I include many of the commoner diseases, the every-day instances of

conjunctival, bronchial, gastric and intestinal catarrh, the scaly and vesicular eruptions, and inflammations produced by injury. From the therapeutical point of view, appealing as it does to vital reactions, and thus, as it seems to me, penetrating farther than others, we might extend the above list, and include the inflammations of measles, scarlatina, and, I think, continued fever. We deal with these on the same principles as we do with other non-specific inflammations; we do not trouble ourselves much about eliminating the supposed poison, but counteract its effects as well as we can. Even in syphilitic disease, where the system is under the influence of a communicated poison, what is more likely to bring on a relapse, after apparent cure, than any deterioration or breaking down of the general health, and what constitutes a better prophylactic than the maintenance of a vigorous state of the system? Our best curative endeavours do not, I think, go much in the direction of elimination; they rather counteract local manifestations of morbid action, and then seek to raise and maintain the general health and vigour.

Parallel with the inflammations, forming a kind of sister group (*"facies non una, nec diversa tamen"*), are the fevers. Viewed in a very general way, they present the same types, the sthenic, and the asthenic or low. The former (of which we see scarce anything nowadays) requires and is benefited by venesection, purgatives, antimony, refrigerants, and such treatment as is appropriate to sthenic inflammation. The latter commonly requires a large amount of wine and support from a very early period. The chief character of the first is excitement and irritability of tissue; of the second, vascular paralysis, the contractile power of the heart as well as of the arteries being much impaired.

Two other groups which may be noticed are the fluxes and the hemorrhages. The *asthenic* form of each depends essentially upon paralysis of vessels, the difference in the profluvium being attributable to some condition of the capillaries or of the surrounding tissue that cannot be exactly defined. Whatever tones the nerves of the vessels will arrest, whatever has the opposite effect promotes these discharges. Depressing mental influence (*vide* Dr. Basham's case in the *Lancet*, Jan. 31st, 1857), cholera miasm as observed by Dr. Prout, and low fever poison as in a case which I recently saw, will all induce hæmaturia. Sthenic hemorrhages resemble fevers of the same type in being attended with great excitation of the heart's action, the arteries of the part affected being, however, uncontracted, from paralysis of their vaso-motor nerves. The bleeding from the nose, which occurs sometimes during the paroxysm of tropical remittent fevers attended with cerebral determination, is a case of this kind. The sthenic fluxes have, as their principal character, a superexcited state of the tissue whence they proceed. The condition is akin to inflammation, but, owing to some peculiar modification of vital power, the exudation is thrown off on the free surface as fast as it takes place. Choleric purging is the most marked example of this kind. Nerve-toning remedies which will arrest asthenic fluxes will not stop sthenic; resort must be had to means which will modify the excited state of the affected surface. This may be effected, in some cases, by castor oil (according to Dr. G. Johnson's plan); in others, by repeated small doses of calomel, or calomel and opium; in others again, by repeated mustard emetics; in others, by frequent doses of diacetate of lead and opium. The effect produced by all these when successful (as all have been), is to nullify the excitation of the gastro-intestinal mucous surface. Dr. Billing's treatment by tartar emetic has the same therapeutic intention. The frequent failure of all these measures to attain their end does not show that they were not appropriate, but either that they could not avail to overcome the morbid action, or that the peculiarities of functional power which would make one preferable to another, do not reveal themselves by any outward indication.

To resume: in inflammations, in fevers, in fluxes, in hemorrhages, we see the existence of the same great types of morbid action; the asthenic, where arterial paralysis (through vaso-motor nerves) dominates; and the sthenic, where tissue excitement and irritation come to play the more prominent part. Nearly the same therapeutic proceedings are appropriate in each of the four sets, the character of the type being the all important circumstance.

Regarding tissue irritation as a prime element of sthenic inflammation, we ought to find notable differences between different parts in the frequency with which they are affected by it. It ought to appear that the greater or less amount of tissue proper is influential on the occurrence of inflammation. Now, it is notorious that membranous tracts and expansions are far

more prone to inflammation than solid parenchymatous organs. Inflammation of the substance of the brain, of the muscles, the heart, the liver, or the spleen, is decidedly rare; of the serous, mucous, or cutaneous surfaces, exceedingly common. One considerable cause of the difference seems to lie in this, that the considerable masses of living tissue persist more steadily in their own normal mode of nutrition, and are not so easily diverted from it into anomalous modes of action. Their functions are all eminently vital, and generally of a higher and more active kind than those of investing membranes. Such parts even of the latter as are more highly organised, and have more important functions to fulfil, are less prone to inflammation. Thus gastric catarrh is infinitely common, but is almost entirely located in the pyloric region, and in the fossulæ of the surface; the special gland-like structure of the splenic and mid regions being very little implicated. The liver, as long as its vital force is unbroken, is rarely the seat of abscess; when, however, it has been overstimulated, and consequently enfeebled, by tropical heat, a casual congestion may produce this effect. The lungs, themselves, though their function be in one sense eminently vital, yet are as liable to inflammation almost as their investing pleura, because their living tissue is scarce more than a mere homogeneous membrane, through which the function of respiration is performed on physical, not vital, principles. The point now referred to certainly puts in a striking view the influence of the tissue of a part on the occurrence of inflammation.

In the foregoing observations, I have frequently made use of the expression "tissue irritation"; and it may be well to attempt to define it somewhat more exactly, and to show what reasons there are for using it. This is the more desirable, because it is what we cannot estimate by itself, or observe so well as we can relaxed and dilated vessels. The term seems legitimate, because the condition to which it refers can be brought about by the application of irritants, such as mustard, or cantharides. The actual condition appears to be one of excitement, as the increased sensibility, blood-flux, and heat would indicate, together with the great tendency to cell development in the exudation. Probably, however, the excitement stage is the earlier, and ceases as soon as general or extensive stasis of the blood has occurred. Indeed, we seem to have evidence of this in meningitis, when the cineritious cortex of the hemispheres is involved, and fierce delirium and raving mark the stage of excitement, while collapse and coma mark that of paralysis of the tissue. In this there is a close analogy to fevers (*vide* Dr. Copland's description, p. 973-983), with their stages of excitement and collapse. In using the term excitement, it is of course not intended to imply that there is any increase of real vital activity and functional power. The action, though an excessive, is a perverted one, tending only to waste and loss of the normal endowment of the part. The difference between this state, and that of healthy excitement, is the same as there is between a sensory nerve in the fulfilment of its natural function, and the same numbed while tortured by the agonies of neuralgia (*vide* Romberg on *Anæsthesia dolorosa*).

[To be continued.]

NOTES ON LIQUOR PEP SINIÆ.

By DAVID NELSON, M.D. Edin., formerly Physician to the Queen's Hospital, and Professor of Clinical Medicine, Birmingham.

HAVING received, through the Editor of this JOURNAL, an inquiry in what manner liquor pepsiniæ is prepared, I have to say, in reply, that I never either prepared it, nor knew how it was prepared, excepting as laid down in the ordinary standard works on pharmacology; the following of which directions, however, often leads to failure. After using the remedy of gastric juice, in the shape of raw or of dried membrane, I desired to have an elegant and efficient preparation, and requested the chemists to make the attempt. After repeated experiments and failures, as to dimness, thickness, and tendency to putrescence, they at length succeeded in producing that pellucid, savoury, and effective fluid, to which I gave the name of *liquor pepsiniæ præparatus*; but I could not ask them, as *men of business*, to explain their mode of procedure, and have never done so.

Other correspondents have opened up other matters of inquiry, as to the comparative virtues of pepsine, so called; and the question of priority, etc.; which I shall, therefore, touch

upon. Recent writings and advertisements have laid stress upon the production of such an article; but I think there are sundry objections to it, not the least of them being the price, and the consequent temptation to adulteration, of which more anon. Let me premise my observations by stating that, while I much admire and use extensively several of these essential principles, such as quinine, hydrocyanic acid, etc., and while the researches of chemists are much to be applauded, even while following out non-practical paths, I yet see no more necessity for pepsine, so called, as an article of the official *matéria medica*, than I do for digitaline, ergotine, lupuline, castorine, emetine, lobeline, theine, and caffeine, or the other thousand and one niceties, highly interesting, but practically useless. As long as we can obtain, from sound plants, etc., good tinctures and infusions, we have all that we want for medical purposes; and so is it with the extraction and the preservation of the mysterious gastric juice from the maw of the sucking calf. Nay more, this pepsine, so called, is but a portion of the wondrous gastric juice. It is not, like iodine or sulphur, a simple body, the purer the better; but it is a complex and theoretic substance, the existence of which as a distinct efficient compound is denied by Liebig himself. But, accepting it as a compound radical, it yet acts within the stomach as only co-operative with other agents; and this gives rise to the danger of its losing its peculiar action in the very attempts at over-refinement. The iron of the blood, like the iron of nature, is always allied with a minute amount of manganese; and it is very questionable if over-purified or chemical iron would serve either as a medicine or a nutrient. Porters, ales, wines, and all spirits, possess one common and fundamental principle of spirit of wine; but the common sense of the profession and of the world would rebel against any attempt to supersede the use of these composite beverages by introducing absolute alcohol, or perhaps, by a further refinement in abstracting the useless water, treating us to medicinal or social doses of ether. Recent writers have remarked of the so called pepsine (a theoretic name, be it remembered, for a mysterious essence known only by its effects), that it is exceedingly difficult to separate it from admixtures of acids and salts; but I believe, with Liebig and Gregory and others, that the chlorides, phosphates, and lactates, etc., of the gastric juice, are potent accessories, or even necessities, to the action of the pepsine; and that, in short, as the whole matter is somewhat dark, the nearer we approach to the imitation of nature the better.

And now for the economical part of the question. An eminent brother physician at a celebrated watering place writes to me, saying, "I have used pepsine in pills. My chemist gives twelve shillings the ounce, and I find a scruple not too large a dose." Now, let us think of the practical working of such a thing. A patient consults a physician, who might order twenty-four doses, to last a week; and, after paying the fee of a guinea, he finds he has nearly as much to pay to the druggist for his medicine. Either the French must be a much more wealthy nation than we give them credit for, or they think they can extract no end of gold out of the dyspeptic tendencies of *milord anglais*. The liquor pepsiniæ, on the other hand, is *retailed* at sixpence an ounce; and a drachm is a good dose. Besides this, it contains all the peculiar salts and acids, as well as the pepsine, which go to constitute the peptic liquor or gastric juice; and it acts with perfect certainty, and is pleasant. We all understand the position and wants of the hard worked practitioner of our country districts. He does not wish to be troubled with niceties requiring this and that series of tests, but to be furnished by a respectable house with a really efficacious and reliable remedy. This is found in the liquor pepsiniæ, useful either by itself or in mixture; and the test of its efficacy may be applied by his good lady in making a milk custard for the youngsters, as one fluid drachm should coagulate sixteen ounces of milk in thirty minutes.

The aforementioned physician also writes, "I read that the pepsine is already shamefully adulterated." This is only to be expected, from the temptation held out by the exorbitant price of the article.

Touching the other question put to me, in regard to priority of introduction (which, however, is but of secondary importance), I beg to say that I have had nothing to do with this recent matter of so called pepsine from France or elsewhere. As may be seen by reference to a correspondence in the *Lancet* for 1856, in connexion with an article on Diabetes in the same journal for 1855, I derived the idea of the employment of gastric juice or peptic liquor from the beautiful experiments of Spallanzani. Other physicians, both before and after, seem to have used it with more or less result, and great merit is due to them. At