necessary by this observer. (See, moreover, a most interesting case, detailed in p. 339 of his work.)

There yet remains a phenomenon in the case I have recorded which requires comment; I allude to the partial reappearance of a weak respiratory murmur over a portion of the postero-middle region, towards the close of the case. If this were not a conducted murmur from the right lung (which was doubted by some observers), I can only explain it on the hypothesis that a portion of the tumour had yielded, and permitted part of the left lung to expand into its place.

Finally, with reference to the differential diagnosis of intrathoracic tumour: when we consider the possible sources of error inseparable from the very nature of certain cases of chest affections and their associate signs, such as those very recently described by Drs. Moutard-Martin and Oulmont (*Med.-Chir. Review*, Oct. 1856); and when we find how, at times, the very ablest observers have been at fault in the diagnosis of malignant disease of the chest, alike from the consideration of the symptoms and the physical signs (the latter, perhaps, are at their minimum of value here), we cite, in special illustration, the well known cases of Boerhaave, Corvisart, Graves, and Stokes, etc., others of less ability may well be excused for hesitancy and doubt. Indeed, it would appear, from a careful collation of the cases extant, that where the family history shows an absence of cancerous disease, where the expectoration is simply catarrhal, marked signs of centric pressure absent, and no external tumour present, the physical signs and symptoms correspond so closely with those of pleurisy, either general or circumscribed, that the diagnosis of intrathoracic cancer, at its early stages, is in most cases difficult, and in others, perhaps, occasionally impossible. At the same time, it must be borne in mind that relapsing pleurisy, with pain more or less constant, and radiating far and wide, combined with alteration of the chest-wall, and obstinately intractable to treatment, should at all times excite grave suspicion.

Original Communications.

INFLAMMATORY ACTIONS, AND THEIR TREATMENT.

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

[Continued from page 216.]

If we regard therapeutic agents as *tests* of the character of the actions going on in the living body, it may be of much interest to consider some of them in their bearing upon the subject before us. Let us take first the ordinary reputed remedies for sthenic inflammation.

Venesection must be considered as addressed chiefly to the attending constitutional disturbance, rather than to the local affection; it works its end, when beneficial, by taking off the stress of the circulating current, and diminishing the force of the heart's contractions, as indicated by the softer, more yielding, and sometimes slower pulse. It is to be regarded as a heart and artery sedative. The sedative action upon the arteries is shown by their becoming less contracted, and yielding more to the force of the heart, and to the pressure of the finger in exploring the pulse. Thus a small, wiry pulse will become larger and softer under bloodletting, because the contractility of its coat (muscular) is diminished. The heart will now act more freely and send the blood more equally over the general system, and so the local determination will be relieved. The increased tolerance of bloodletting in sthenic inflammation is a very striking circumstance, and cannot be well referred, I think, to any other cause than to an increase of nervous force in those ganglia or centres which influence the heart's action. A strong contractile action of the heart, and a tense, contracted state of the arterial coats generally, must imply, I think, increased innervation of these parts, since the opposite state is observed in all morbid conditions wherein nervous power is materially lowered. At the present time, together with an absence of all conditions that require or justify venesection (speaking generally), I meet with instances of impaired action of the heart, sometimes amounting to serious danger. This is associated with other symptoms of depressed nervous power, which appear to be most reasonably attributed to some kind of epidemic influence, much resembling that of malarious disease. The reaction

which occurs after venesection, and which is stilled by opium, can hardly be otherwise regarded than as a phenomenon produced through the nervous system. That venesection (when performed so as to abstract blood rapidly) can produce also local effects, is shown by the occurrence of nausea and vomiting, and the breaking out of perspiration, which it not unfrequently occasions. In this case it acts evidently in the way of shock through the nervous system, as the same phenomena may result from the sudden rupture of a bloodvessel within the cranium.

That *local bleedings* exercise a sedative effect upon an irritated tissue in sthenic inflammation seems to be certain, not only from the good effects so commonly observed from it, when performed on a part whence blood can be directly abstracted from loaded vessels, but much more from the benefit obtained when this is not possible. No one can doubt that leeches applied to the epigastrium will very materially relieve an inflamed stomach, yet how is it conceivable that this relief is effected? It surely is not by the quantity of blood abstracted from the general system (as in venesection), and it certainly is not by any direct depletion of the gastric vessels themselves. We seem to be absolutely shut up to the conclusion, that the modification of one part in its nutrition can affect an adjacent, in such wise that a state of irritation, and active determination of blood thither, shall be diminished. The same remark applies to the leeching of the temples to relieve hyperæmic and irritated conditions of the encephalon, and to many other like cases. Had it not been for experience, we should have thought the proceeding quite irrational; but in this, as in other instances, we are instinctively, if not divinely, led to do the right thing first, and at a later period we come to reflect, and try to discover the principle, or reason, of our practice.

Cold, it will not be questioned, exerts a sedative action on an irritated tissue. It benumbs nerves, and impairs the play of muscles, if at all considerable, and it is, therefore, likely to act similarly on an inflamed part. In orchitis, Mr. Curling has proved its adequacy to cure by repeated and prolonged applications; and in meningitis and maniacal excitement, its beneficial action is well known. Similarly, in inflammatory states of the stomach, lumps of ice are administered with much advantage; but, if the vomiting depend merely on deranged innervation, they are productive of little or no good. In all these cases, it seems impossible to refer the good effects of the cold solely to its causing contraction and shrinking of the bloodvessels, though this operation may have some share in the result. In fact, the sedative power of cold is most strikingly shown by its power of arresting the circulation in a part, and causing it to become blue, or livid, from stagnating or slowly moving blood. This is unlike the usual action of cold in rendering a part pale and bloodless by contracting its arteries; the retardation of the blood must depend on a paralysis of the normal nutritive processes, which have so much influence in modifying its distribution.

Antimony and *ipeacacuan* have strong claims to be regarded as sedatives of certain tissues, although their local application in a more concentrated form is strongly irritant. That they will subdue sthenic pulmonary inflammations is for me a certain fact, as also that they will aggravate and increase asthenic. I suppose also that their power, when given early as emetics, to arrest or check acute tonsillitis, orchitis, and adenitis, may reasonably be admitted. The benefit produced by ipecacuan in sthenic dysentery, when given in frequently repeated doses, is also, I believe, unquestionable. The powerful effect of antimony for good in croup is not a matter of doubt. Whatever be the exact way in which these remedies act, whether directly on the tissue, or through the nerves, it must be, I think, admitted that they do modify that morbid tendency to accumulation and arrest of blood in the suffering parts, which we have regarded as a main feature of sthenic inflammation. They are contrastants. The muscular relaxation and general debility induced by full doses of antimony and ipecacuan, as well as their diaphoretic action, show that they must act powerfully on contractile tissue, voluntary and involuntary, and this in a way of paralysing and weakening its power. This points also in the direction just indicated.

Colchicum, with its magical action in reducing the articular inflammation of sthenic gout, must also be alluded to. Its action in acute rheumatism, though much more uncertain, is also, according to Dr. Watson's testimony and Dr. Fuller's, almost as striking. My experience agrees with that of these physicians, as to its being most appropriate to the synovial or articular form of rheumatism. These instances of the beneficial operation of colchicum are not necessarily connected with its

purgative effects. I cannot think we are far from the truth, if we assume that this drug acts on the articular tissues in such a way as to nullify the morbid nius to inflammatory congestion. It is an articular sedative. From one experiment which I made on a healthy individual, it resulted that colchicum neither increased nor diminished the quantity of uric acid in the urine. The amount before the experiment having been in 24 hours 6.10 grains, it was during the administration of the drug 6.11 grains. The urea, on the other hand, was diminished from 336.600 grains to 272.075 grains in twenty-four hours. The acidity was somewhat diminished.

In the list of tissue sedatives, I think *alkalies* may be enumerated, at least when given in such quantities as to influence the system decidedly. Among these, the citrates, tartrates, etc., may be included, which are converted into carbonates in the blood. Dr. Fuller testifies to their "acting most powerfully as sedatives, and calming the action of the heart and arteries." In more precise language, this means that they quiet the action of the heart, as shown by the great diminution in the frequency and force of the pulse. The increased action (throbbing) of the arteries is of course only apparent, as these tubes can have no other active function than that of contraction; a hard, wiry pulse would indeed indicate increased arterial action, but this was not the character of the pulse in the cases referred to by Dr. Fuller. Their effect also on the inflamed joints in rheumatism is very positive, and equally so on the inflamed patches of sthenic eczema, lepra, and psoriasis. Dr. Bennett treats eczema effectually solely by alkaline lotions; and in the squamous skin diseases, there is much evidence of the good effect of liquor potassæ given internally. In prurigo senilis, I have found marked benefit result from the use of alkaline baths. I strongly suspect that much of the benefit produced by the administration of soda in irritable state of the stomach and intestinal canal, depends not on its neutralising the acidity (which is normal), but on calming the irritable tissue when conveyed to it by the blood. The advantage which Dr. Owen Rees states to be derived from the employment of alkalies in cases where the mucous membrane of the urinary passages is inflamed and secreting muco-pus (so rendering the urine alkaline), depends, I conceive, rather on the general sedative action of these remedies on inflamed tissues, than on their rendering the urine less acid and irritating. This is rendered the more probable from a circumstance which he himself states, viz., that small doses of liquor potassæ, ℥xv-xx ter die, sometimes render an alkaline urine acid. They surely do this rather by a direct action on the inflamed tissue, than by rendering the urine less acid. Maunsell and Evanson speak of the alkalies and alkaline earths as exercising "a decided sedative influence, especially upon the mucous membranes when in a state of irritation or chronic inflammatory action." Competent observers have assured themselves of the good effects of alkalies in the less severe degrees of bronchitis. An over use of alkalies induces a cachectic condition, "characterised by paleness, debility, general tumefaction of the tissues, passive hæmorrhages, and finally emaciation." (Trousseau.) The general tenor of all these statements accords very much with the view that alkalies act as tissue sedatives.

The influence of *mercurials* given so as to affect the general system is yet a moot point. Some, and more particularly those of the Edinburgh school, seem to deny their efficacy altogether, or rather to think them injurious. On the other hand, the testimony of Tyrrell, Watson, Copland, Williams, Graves, Wilde, not to mention a host of others, is as positive as anything can be to the powerful remedial action of mercury *properly administered*. But in that word, *properly administered*, lies a great deal; and how much it implies is, I think, not sufficiently considered by those who speak of mercury as useless or injurious. Mr. Tyrrell, writing nearly twenty years ago, has given in his work as excellent directions as any that I know for the proper management of this powerful agent; and all that need further be added is, I think, that the type of disease which reigns at present, and which seems to have prevailed more or less since the appearance of pestilential cholera among us, is decidedly unsuited to the beneficial action of mercury. There is now little of sthenic inflammation; bleeding and tartar emetic are but sparingly needed, while quinine, strychnine, and other tonics, with opium and cod-liver oil, are continually in requisition in our efforts to raise and maintain failing power. Remembering the tendency of mercury to destroy red blood, to cause prostration, and even fatal syncope (as in hydrargyria), I am sparing of its use in all feeble systems, especially seeing, as I do occasionally, embarrassment or partial paralysis of the heart's action from some morbid influence

telling upon the nerves. But even now, in appropriate cases, I think there is much evidence in favour of the view that mercury acts as a sedative of sthenically inflamed tissues. The testimony of my friend Mr. White Cooper is most express as to its good effects in iritis independent of depletion. Just at the time that the gums become affected, the red zone declines, and all the other symptoms begin to improve. Mr. Critchett has some excellent remarks also testifying to the efficacy of mercury, and pointing out the best means of bringing it to act beneficially in cases where unskilfully employed it would be most injurious. (*Lancet*, Jan. 20th, 1855.) Of its efficacy in orchitis we cannot doubt, nor in myringitis, nor in many cases of pleurisy and peritonitis. In lichen agrius, I have found the good effect of mercurials very positively marked; and, except alkaline baths, I know of scarce any other remedy that is of much avail. Now, according to my observation, the subjects of lichen agrius are generally possessed of much vigour and strength of system, so that mercury might be expected to suit their disorders. Dr. Watson states "his persuasion that in the early period of acute inflammation of the encephalon, if the mercury comes in a short time to produce its specific influence upon the gums, a great change for the better will often be perceived." The highly interesting cases published by Mr. Solly, afford valuable evidence of the good effects of mercury in conditions more or less similar. They are very parallel to those of ocular disease recorded by Mr. Tyrrell, the same judicious delicate management having been exercised in both. I might in passing say here how much profit I have always found from the perusal of well recorded cases, such as those just alluded to. Abstract descriptions leave the mind quickly, but well told cases remain as abiding lessons.

[To be continued.]

CLINICAL OBSERVATIONS ON THE TREATMENT OF FRACTURES BY THE IMMOVABLE APPARATUS.

By JOSEPH SAMPSON GANGE, Staff-Surgeon of the First Class, and Principal Medical Officer of the British Italian Legion during the last war; late Assistant-Surgeon to the Royal Free Hospital, House Surgeon to University College Hospital, etc.

[Continued from page 190.]

We have now sufficiently commented on the main features of the plan of treatment under consideration to be able to state the question at issue.

The three main features of an immovable apparatus applied to a broken limb being *immediate reduction, gentle uniform compression of the soft parts to cure and prevent their swelling, and absolute and complete immobilisation of the fragments*, it is necessary to determine how far these principles of action are sanctioned by sound doctrine and experience; and to inquire whether the plan of treatment under consideration be applicable and specially advantageous in so large a number of fractures as materially to simplify this department of surgery. *Simplex sigillum veri* was the favourite motto of that great practical surgeon, Mathias Mayor—a motto embodying a principle which through all time has been, and must endure, the dominant idea in sound surgical minds.

It will be necessary, before entering upon the doctrinal and experimental consideration of the question as just stated, to describe an immovable apparatus, and its mode of formation. For this purpose, I shall assume having before me a simple case of broken leg in a muscular adult; the two bones broken across, or very nearly so, about the middle; no shortening; little tendency to displacement; no injury to the skin, or swelling beneath it. The fragments having been brought into perfect contact, the great desideratum is to maintain them in that position, at the same time to prevent the occurrence of complications, of which swelling is the most probable. These objects are attained by the construction of a solid casing, including the joints above and below the seat of fracture, and closely fitting to every inequality of the limb. Such a casing may be constructed with bandages impregnated with plaster of Paris, or with common bandage and pasteboard smeared with starch.

1. *Plaster of Paris Bandage*. For the preparation of this bandage, an unglazed thin cotton texture is best suited; the wider its meshes, the more desirable. By rubbing into it as much dry powdered plaster of Paris as it can hold, the bandage is prepared for rolling and application. The skin is first to be pro-