ON THE PATHOLOGY AND TREATMENT OF PERTUSSIS.

By GEORGE FIFE, M.D., Newcastle-on-Tyne.

On no disease of common occurrence, has a greater diversity of opinion apparently existed as to its true pathology or seat, than, even at this time, prevails in regard to that of hooping cough. If, in support of this statement, any evidence should be required, such is abundantly afforded by a consideration of the very numerous and diverse remedies which have been recommended for its mitigation or cure. Hence, no apology seems requisite for the obtrusion of the present remarks on this peculiar and interesting disease upon the attention of the Association. To enter into a full enumeration of the various causes to which it has been assigned, would occupy more of time and space, than the limits of this paper permit, consequently, for the present, I will restrict myself to the consideration of what may be termed the two principal doctrines which modern practitioners hold on the subject.

One of these parties may be said to maintain the inflammatory nature of hooping cough, and to consider it as essentially a form of bronchitis; the other regards it as a peculiar nervous and spasmodic disease, and specific in its character.

The former opinion I believe to be advocated by the majority of the profession, whilst to the latter, for reasons which will be apparent in the sequel, I, after extensive practical observation, and the most mature consideration, am disposed to give my support.

Fashionable as it now is to impugn and even to ridicule the nosological division of diseases by the illustrious Cullen, I am free to admit, that in his definition of pertussis, he has not only been most happy, but has also rested his views on what is perfectly compatible with the most recent pathology. His definition I will now therefore give, prior to entering upon the the more particular consideration of the pathology of the disease itself:—

“*Morbus contagiosus; tussis convulsiva, strangulans, cum inspiratione sonora, iterata; sæpe vomitus.*”

The first proposition in the above, as it has but little reference to the actual nature of the morbid action going on, may be passed over with comparative brevity. Of the epidemic prevalence of hooping cough every practitioner of any experience must be perfectly satisfied, and but few will be found to deny, that if the term *contagious* be used as synonymous with *infectious*, even on this point the definition of Cullen is correct, and it is more than probable, that such is the sense in which it has been used, however objectionable it may be to confound infection, properly so called, with contagion, taken in its strict and literal sense. Of its infectious character I could adduce ample evidence, but it may suffice to state, that in many cases I have known it carried from places where the disease prevailed, to others in which no instance of it had previously occurred, and in the latter

to become epidemic. From the repeated observation of this fact, I feel called upon to admit the accuracy of Cullen's definition, with the qualification of the term “contagious” being used synonymously with infectious. It is only necessary to add, that this affords farther proof of the “specific” nature of the disease, as a disease to be capable of propagation in such a manner, must have a specific character. In this respect, hooping cough follows the known laws of most diseases which prevail epidemically, and all of which, I believe, can and do occasionally assume the property of extension by infection.

The definition of the cough could not well be more accurate, as, brief as it is, when taken in connection with its generic position, it embraces all save one characteristic, viz., its occurrence in paroxysms, which will demand our especial notice hereafter. The term “convulsive” here may be taken as expressive of “spasmodic,” and can therefore be subject to no objection; its “suffocative” character is equally unquestionable; whilst its being accompanied by sonorous and repeated loud inspirations, is the cause of the name “hooping” being given to the disease, and must therefore carry with it the assent of all. The last-mentioned phenomenon—“vomiting”—also demands particular attention, as it forms one of the main diagnostics of the disease, as will be presently shown. The only omission of consequence in the above otherwise very concise and truthful definition, is that of its occurrence in paroxysms, with an interval of health between them. When the above is compared with the symptoms of bronchial inflammation, we shall very readily perceive that the analogy is but remote, and that the disease under consideration, however frequently complicated with bronchitis, is essentially distinct from it. Another circumstance requiring notice is the occurrence of hooping cough but once in a life-time, whilst bronchitis may and does repeatedly attack the same individual, hooping cough also, for the most part, happening in the early years of infancy and childhood.

Let us now take a glance at the symptoms characteristic of inflammation of the mucous membrane lining the air passages, and then compare them with their concomitant physical signs,—with those met with in, and generally admitted as pathognomonic of, pertussis. Here again the definition given by Cullen, though under the term of catarrh, is sufficient to indicate the difference, which recent pathology confirms, as existing between the two diseases, as does also the position which he has given to it in his classification.

“*Pyrexia sæpe contagiosa; muci ex glandulis membranæ narium, faucium, vel bronchiorum, excretionis aucta; saltem hujus excretionis molimina.*”

Again, his division into species:—

Sp. 1. Catarrhus à frigore.

Sp. 2. Catarrhus à contagio.

Under the first of these may be included common or accidental attacks of bronchitis; whilst the latter, as obviously applies to what has now received the appellation of "Influenza." The above definition is somewhat imperfect as applied to bronchitis, as is also its position objectionable, as in it the primary stage of the disease, which is truly inflammatory, seems to have eluded observation, and the second only to have arrested attention. Without dwelling longer on the imperfections of such definition, I will, as briefly as possible, endeavour to make good the deficiency or error, and thereby indicate more clearly the difference between bronchitis and pertussis, merely observing that, like other inflammatory affections, bronchitis should have been placed under the head "*Pneumonia*."

Bronchitis, like pneumonia, may, by careful observation, be very properly divided into stages, and it is in fact of the greatest importance to its successful treatment, more especially in infancy and childhood, to note such stages, as the therapeutic indications are seriously influenced by the pathological condition peculiar to them. In the commencement of an attack of bronchitis, the symptoms are the following, modified by the severity of the disease, and the extent of lung involved, as also by age and temperament, acceleration of breathing, with (in most cases,) pain on a full inspiration being made, which is also almost always productive of cough. The cough, which is generally present from the very commencement of the disease, in a greater or less degree, is at first dry, short, and hard, being unattended at this period by any expectoration; as the disease advances, expectoration of a frothy tenacious mucus takes place, which, as it becomes more free and easy, is accompanied by a very marked remission of all the symptoms. The cough throughout the whole course of bronchitis is *casual* in its occurrence, although repeated efforts are sometimes requisite to dislodge the mucus, when very viscid and tenacious. In an ordinary case of bronchial inflammation, the following are the physical signs:—

Percussion generally elicits a dull sound, which is regulated in extent by that of the portions of lung affected; thus it may be confined to a single lobe of one lung, or it may prevail over the whole of one or even both sides of the chest. When the stethoscope is applied in the early stage, we have the dry, sonorous, and subcrepitating rales in the affected parts, whilst in others, the respiratory sound will be so augmented as to claim the term "*puerile*." As the disease makes progress, the sonorous dry rale is lost, and we have in its stead the moist or mucous rale, this last being materially influenced in its character by the *tenacity* and quantity of the mucus, and also by the size of the tubes in which it is present.

The foregoing very brief and superficial notice of bronchitis has been given merely for the purpose of

facilitating the comparison which must now be instituted between the two diseases, and for such end may prove sufficient. One other remark only is at present necessary, viz., these symptoms and physical signs, although they vary in duration and intensity according to the progress and duration of the disease, are continuous,—i.e., unattended by any *real remission* or *interval of health*.

If we compare the symptoms of the two diseases, we shall readily, and by very unequivocal evidence, see that they are not only distinct in their nature, but also, on farther examination, find that they cannot co-exist. To such comparison I will now proceed:—

In bronchitis the fever corresponds with the extent and severity of the attack, and continues with little or no remission so long as the inflammatory action persists. The pulse is generally in a proportionate degree, accelerated and hard; the face is flushed; the eyes suffused; the cough is at first hard, dry, and though casual in its occurrence, distressing from its constancy; it is also seldom, if ever, terminated by vomiting; it finally becomes loose and less harsh, and is attended by expectoration; whilst the auscultatory sounds already described are always present, and gradually disappear as the inflammation subsides. Bronchitis occurs sporadically, and is peculiar to no period of life. Nor does the patient who has once suffered from it obtain any exemption from future attacks, but on the contrary rather acquires a greater tendency to it.

Whooping cough is generally met with during infancy and childhood. It seldom assails the same individual more than once in a lifetime. It most generally prevails in the epidemic form, and is capable of propagation by infection. The cough occurs in paroxysms, is spasmodic in its character, and is generally terminated by vomiting. Between the paroxysms there is an interval of apparent health, during which, even when the paroxysms are most distressing and violent, the patient makes no complaint. In a very large proportion of cases, percussion and the stethoscope afford no indications of disease, although in many cases there is more or less of the *mucous rale* audible, which of course is indicative of increased secretion into the bronchial tubes. This phenomenon deserves especial attention, as it may appear to indicate the presence of sub-acute bronchitis; it may, however, be explained independent of such condition, and therefore shown not in reality to militate against the view of the pathology of the disease which I am about to advocate.

What has now been said of the symptoms sufficiently indicates the difference between the symptoms and physical signs of the two diseases; hence, it is only necessary to take a brief glance at the pathological condition on which such difference depends, and which will be found to be important, not only in fact, but still more so as regards the successful treatment of either one or other. One prefatory remark may be made,

viz., that bronchitis very frequently supervenes on pertussis, or, in other words, becomes a complication of it, or, *vice versa*; this being made evident by bronchitis when the epidemic influence which generates pertussis prevails, terminating in the latter.

The pathology of bronchitis is now so universally understood, that it is superfluous to enter upon the *ratio symptomatum*. Not so, however, that of pertussis; wherefore, some little space must be devoted to the consideration of the phenomena met with in, and characteristic of, this very peculiar disease. The features which more especially call for notice are the following:—The character of the cough, its occurrence in paroxysms, and termination in vomiting; the interval of health between the paroxysms of coughing; the general absence of the physical signs invariably present in bronchitis. On each of these heads a few remarks may now be made, in order to demonstrate, by subsequent comparison, the real difference between *bronchitis* and *pertussis*.

First, the cough is spasmodic in character, occurs in paroxysms, and very generally terminates in vomiting. It has been well observed, that the violence and convulsive nature of the cough resembles that which arises from the presence of foreign bodies in the larynx; and that the larynx is very mainly implicated in its production, may be easily perceived by any one who will carefully observe the state of the child during the paroxysm, when, from the violent action of this organ and the contiguous muscles, it will be apparent that the chest itself is comparatively passive. The opposite is observable in cases of bronchitis, except where continued coughing is required to evacuate the viscid mucus, so commonly present in the earlier stage of the disease. The violence of the fits of coughing in pertussis forbids the idea of the existence of any continuous affection of the air-tubes as its cause; as, were such really the case, we should not only have serious febrile action, but also during the prevalence of such agency no interval of repose could by possibility have place. That the larynx is mainly concerned in pertussis, therefore, may be inferred; nor is this conjecture at all invalidated by the forcible and loud inspirations to which the "hoop," or "whoop," is properly attributed, such effort being physiologically requisite to compensate for the interruption which respiration sustains during a paroxysm. The termination of the cough by vomiting deserves especial attention, not only because it is a pretty constant occurrence in this disease, but also as tending to corroborate the view now taken of its pathology. In all probability this symptom has its origin in the participation of the stomach in the morbid condition already alluded to as affecting the larynx. Nor does the quantity of mucus discharged in this way in any degree militate against such supposition.

From these symptoms, together with the interval of

comparative health, except where the case presents a complication with bronchial inflammation, I am led to consider the actual seat and nature of pertussis as essentially referrible to some morbid condition of the *pneumo-gastric nerve*, the influence of which over the organs of respiration and digestion is too well known to require comment.

The advocates of the inflammatory nature of hooping cough have laid considerable stress on the presence of the mucous rale during the intervals. If, however, the influence of the nerves generally, and of the *eighth* in particular, over secretion be considered, we shall in this sign even find corroboration of the nervous origin of the disease. This is farther supported by the immense quantity of mucus so frequently discharged from the stomach, to which fact is probably to be ascribed the notion of some of the older writers, that hooping cough was "*true catarrh of the stomach*." From our still very imperfect knowledge of the nervous system, it would be little short of presumptuous in me, and most certainly idle, to enter into any speculations as to the real condition of the nerves in this disease; wherefore I will endeavour by a brief summary, to compare and point out the difference between this disease and inflammation of the air-tubes, premising that, with laryngeal or tracheal inflammation, it is impossible for any practical man for one moment to confound it.

Pertussis is essentially a disease peculiar to infancy and childhood. Bronchitis occurs indiscriminately at every period of life.

The cough in pertussis is spasmodic or convulsive, always occurs in paroxysms, and very frequently assumes a periodical type. In bronchitis it is casual in occurrence, however frequent and distressing, and rarely attended with vomiting, which is the common termination of the paroxysm in hooping cough.

In pertussis, the patient is comparatively well during the intervals; in bronchitis there is no *intermission*, although there may be some remission of symptoms.

Pertussis almost invariably occurs as an epidemic; bronchitis is of sporadic occurrence, but from any peculiarity in the atmosphere, or sudden vicissitudes in the weather, frequently prevails epidemically.

Hooping cough is unattended by fever; bronchitis in its mildest form, presents us with febrile disturbance. When fever is present in pertussis, it does not bear any proportion to the frequency or violence of the paroxysms; in bronchitis it corresponds with the extent and degree of the local affection.

The cough in bronchitis is unattended by the "whoop" to which pertussis owes its name, whilst in the latter, this pathognomonic symptom is lost, so soon as inflammation of the bronchial tubes actually sets in.

Finally, the treatment which alone is to be relied on in bronchitis, has little, if any, effect, either

in shortening the duration, or mitigating the severity of hooping cough.

The morbid appearances met with on examination of those who have died from this disease, may be supposed to favour the inflammatory doctrine, as in a large proportion of such cases bronchitis has been the cause of death; this, however, only confirms what has been already stated,—viz., that bronchitis frequently supervenes on pertussis. So far as my own experience extends, I would say that more fatal cases have been owing to the accession of cerebral than of pulmonary disease; the preponderance of the one or other appearing to be, in a very great measure ascribable to the progress made in the process of teething, during the operation of which a majority of fatal cases has been in consequence of the super-vention of head symptoms, even when bronchial inflammation had been previously present. Thus, during one very general epidemic of hooping cough, in the treatment of which I was extensively engaged, about seventeen years ago, the most common fatal termination was either by convulsions or effusion into the cavities, and between the membranes of the brain.

From the length to which these remarks have extended, I must now be as brief as possible in regard to treatment. In hooping cough I have never seen any actual benefit result from depletion, except where active inflammation was in existence; on the contrary, positive injury appeared, in several instances, to follow its adoption. This observation applies both to the general and topical abstraction of blood, which seemed not only to exert no influence in diminishing the severity of the paroxysms, or curtailing the duration of the disease, but also to add to the already morbid sensibility of the system. Full emetics, repeatedly given, aided by alkalies, with cochineal, were, in the simple form of the disease, most efficacious; to which may be added, the internal and external employment of sedatives, as the hydrocyanic acid and the tincture of *hyoscyamus* internally, and friction of the spinal region of the chest, either with the soap liniment with opium, or camphorated oil, either of which I have found more useful than more stimulant embrocations. Of the emetics, ipecacuanha, alone, or in combination with small doses of the sulphate of zinc, has been preferred to antimonials. Where, in addition to the hooping cough, the patients suffered from bronchial irritation, the ipecacuanha wine, or the antimonial wine, was advantageously added to the alkaline mixture with cochineal. From papers which have been recently written on the utility of the carbonate of potass with cochineal, it may not be irrelevant to state, that such combination has been in use for a very long period, I having first met with it in a manuscript of formularies used by my late father, who copied it; when a young man, either in London or Edinburgh, and used it extensively in his practice. When the disease has

persisted for some time, and circumstances permit, great benefit is derivable from change of air. During the earlier period, however, the observance of an uniform and rather warm temperature has the advantage of preventing the supervention of bronchitis, thereby materially lessening the danger of the disease, and also increasing the efficacy of other treatment.

CASE OF STRANGULATED FEMORAL HERNIA SUCCESSFULLY TREATED BY OPIUM.

By CHARLES MAYO, Esq., F.R.C.S., Surgeon to the County Hospital, Winchester.

TO THE EDITOR OF THE PROVINCIAL MEDICAL AND SURGICAL JOURNAL.

SIR,

Not observing that any other correspondent has given you the result of his experience in the treatment of strangulated hernia, after the manner recommended by Dr. Butler Lane, in the *Provincial Journal* of the 21st ult., I beg to send you the following case, which seems to be strongly confirmatory of his views.

Mrs. D., aged 67, became subject to femoral hernia on the right side about four years ago, at which time it was strangulated, and after some trouble I succeeded in reducing it by the taxis. Since that time she had worn a truss, and was careful to keep it reduced. The truss had now become broken and nearly useless. After some unusual exertion on the morning of the 24th of April, she felt a large portion of bowel suddenly to protrude, she became sick, took opening pills, and laid up. On the 25th she sent to me; I found the swelling as large as an egg, painful, and tender, from her having used much exertion in endeavouring to reduce it, or push it back, as she said. She was constantly sick. I gave her a cathartic enema, and used the taxis without effect. I then left her six pills with a grain of opium in each, desiring her to take one every hour till I saw her again, beginning at four p.m. At nine o'clock I found that she had taken four of the pills, that the vomiting had ceased after the first, and that she was quite easy; cold cloths were kept applied to the swelling, which remained immovable. As she was so easy, I advised the two remaining pills to be taken at intervals of four hours, another glister to be thrown up in the course of the night, and a cathartic draught to be given at six in the morning.

April 26th. I received a message this morning that Mrs. D. was completely relieved, and on my calling about twelve o'clock, I found that the fifth pill was taken at midnight, and the sixth at four in the morning; after this she felt completely relaxed all over, her bowels rumbled about, and the swelling seemed to be enlarged and distended with wind, but soon after on feeling it with her hand, it had become softer, and presently went entirely up under very slight pressure. She took the draught at six, it had operated satisfactorily, and she was delighted to sleep all the day after.