

ARTICLE II.

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DISSERTATION

ON

CYNANCHE TRACHEALIS, OR CROUP.

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OF CYNANCHE TRACHEALIS, OR CROUP.

THE tracheal quinsy is selected for the subject of the following dissertation, not because it is a new form of disease, nor because much has not been written on the subject: but partly because its occurrence in certain parts of the country is so rare, that some physicians can scarcely say, they have ever seen a well marked case of it; and chiefly because the medical opinion respecting its nature and treatment has been, and for aught I know, still continues to be, much divided. For whilst one, considering it as properly inflammatory, recommends the use of the lancet, and other depleting measures; another, viewing it as principally nervous, prefers an antispasmodic course; whilst a third, not reducing

it to any particular class or order, but treating it as a mere *lusus naturæ*, has recourse to specifics.

THE object of this essay is not to introduce any specific remedy, or new discovery made by the author, for he pretends to none ; but it is to invite, yea to urge, a more close attention to the discoveries already made, and laid before us ; for it is believed, that these, if duly attended to, would prove amply sufficient to extricate the medical mind from its present embarrassing dilemma, and remedy the evil of which we complain.

THE remedy here sought, all will agree, consists in a thorough investigation of the real nature of the disease. For if physicians were once agreed on this point, they could not widely differ respecting the proper mode of treatment. But so long as one physician believes the disease to be principally spasmodic, and another, that it is directly inflammatory ; so long will their prescriptions not only be different, but, as it respects some of the fundamental parts of the treatment, diametrically opposite. They cannot both be right, though they may, each of them, appeal to what they deem facts, or the success of their practice, for their justification. For there are cases of all diseases so mild, that the patient might recover from them even under a very improper mode of treatment. Hence the importance of great circumspection in drawing practi-

cal conclusions. For though we admit, that experience is a good teacher, and that success is a just recommendation of a man's practice; yet we must likewise allow, that, unless we adapt our remedy to the nature, and other circumstances of the disease, we draw a bow at a venture, which the most ignorant pretender may do, as well as we.

THE knowledge of the real nature of the disease being so very important, how, it may be asked, is this most desirable object to be obtained? To which I answer, it may be obtained in two ways: First, by a close attention to the testimony of those worthies, who have gone before us, who have carefully examined the bodies of those who have fallen victims to the disease, and who have faithfully transmitted to us the result of their discoveries. And, secondly, by the frequent and careful employment of the dissector's knife ourselves. For it is by dissection alone, that we are enabled to trace to their source many of the symptoms of some of the most abstruse and dangerous diseases. How vague and hypothetical must have been our ideas of their nature, and how unfounded and empirical our practice, in almost all diseases dependent on some internal affection, were it not for the light thrown on the subject by dissection. It is substantial knowledge thus obtained, that distinguishes the real physician, a noble and dignified character, from the base impostor, who sports

with the life of his patient, to get possession of his purse strings!!

A SKETCH OF THE HISTORY OF CYNANCHE TRACHEALIS.

THIS species of quinsy, it is probable, was not distinctly known to the ancients, since they have left us no particular account of it. But that the disease did exist in ancient times, and that the ancients had some confused notions of it, is likewise rendered probable, by this circumstance: they mention the occurrence of cases of Angina, in which there was no appearance of either inflammation or swelling in the fauces or neck, which they deemed peculiarly dangerous. The words of Hostius are these: "Gravis et illa species Anginæ, cum gutturis interni musculi sic inflammantur, ut neque in faucibus neque in cervice quidpiam appareat; unde CELSO merito pestiferus, GALENO maxime peracutus, HIPPOCRITE vero lethalis, dicitur." But whether these singular instances were or were not, cases of real croup, I pretend not to determine.

THE merit of the first discovery of the croup is attributed to several authors. But we, in this country, are indebted for the first particular description of it to Dr. HOME of Edinburgh, who published an ingenious treatise concerning it, under the appellation of Suffocatio Stridula, or Croup, in 1765. But MICHAELIS issued a work

on the subject at Strasburg in 1778, denominating the disease *Angina Polyposa sive Membranacea*, in which he says, that MARTIN GHISI, an Italian physician, gave the first regular account of it, in a medical production, (*Lettere Mediche*,) published at Cremona, in 1749. Since which time many learned professors and other ingenious practitioners, in this, as well as in other countries, have favoured the world with their interesting observations on this truly alarming, and too often fatal disease.

CYNANCHE Trachealis is not peculiar to the age of childhood, as Dr. HOME supposed it to be; for adults are sometimes the subjects of it. But it much more frequently attacks children between the time of weaning, and that of twelve years of age, than at an earlier, or later period of life. I have seen an infant at the breast, only ten months old, most severely attacked by it; but the child was of an extremely corpulent habit. The case of one adult only has fallen under my own observation. This was a maiden lady, who scarcely ever enjoyed what might be called tolerable health; but who habitually laboured under a high degree of dyspepsia, and *suppressio mensium*. And it is said, that WASHINGTON, the political Father of our country, fell a victim to this cruel disease!

DIAGNOSIS OF THE CROUP.

IN giving the diagnosis of this disease, I shall divide the symptoms into two classes. The first class comprises those symptoms, which, though they usually accompany it, do not distinguish it from other febrile diseases. These are called its concomitant symptoms. The second class embraces only those symptoms which are peculiar to the croup, and distinguish it from all other diseases. And these are called its diagnostic symptoms.

1. *Of the concomitant symptoms.* THESE are no other than the symptoms of the fever, which accompanies the disease. And the fever attending the croup, may be either a synocha, or a typhus, or it may hold an intermediate rank between these extremes, according as the patient happens to be in a vigorous and firm state, or of a slender and delicate habit, or possessing a state of health between these extremes: for the fever commonly bears a proportion to the general state of the system, whether it be strong and robust, or weak and delicate. All that is necessary to be observed, therefore, respecting the concomitant symptoms is, to impress on the mind the necessity of distinguishing between the febrile symptoms; because on a just discrimination of them depends the application of the remedies about to be proposed.

THE febrile symptoms accompanying a true synocha, are those which originate from bodily strength and vigour, resulting in a high degree of general excitement, and which are distinguished by a flushed countenance, great heat and thirst, with a full and strong pulse considerably increased in frequency. This state of the fever, at the same time that it calls for a bold application of the depleting remedies, denotes likewise that the patient will bear it, as such patients very frequently recover.

ON the other hand, the symptoms of typhus are, a pale dejected countenance, little heat or thirst, with a pulse considerably increased in frequency, but small, weak and obscure. These symptoms, as depending on general debility, exhibit a caveat written in capitals, respecting the treatment of the disease; and at the same time that they admonish us of the inability of the patient to bear any great evacuations, they portend the greatest danger. For almost the whole number of patients, which I have lost in the croup, have been of this description.

THESE are the two extremes in the form of fever in croup. But in practice we shall find it occupying all the intermediate grades, and requiring the adaptation of our remedies to each.

2. OF THE DIAGNOSTIC SYMPTOMS.

THE symptoms which distinguish the croup from all other diseases, are to be found, 1st. in

respiration, and the manner of breathing ; 2dly, in the peculiar sound of the voice, and the manner of uttering it ; 3dly, in the appearance of the countenance ; and 4thly, in the deglutition.

1. THE respiration is extremely laborious, and performed with a peculiar wheezing sound. And sometimes there is a kind of rattling noise, as though something hung loose in the trachea. The dyspnœa is so great, that the abdomen is thrown into great commotion. For the scrobiculus cordis and hypochondria are depressed or drawn inwards in a very remarkable manner, at each inspiration ; whilst the abdomen is formed into a very prominent tumour near its centre, at each expiration ; and these motions of the abdomen alternate with each other at each inspiration and expiration.

2. THE peculiar sound of the voice, in the croup, is not easily described. Dr. Home compares it to the crowing of a cock ; “*vox instar cantus galli.*” But this appears not to be a very near resemblance. Whilst Dr. Cullen more justly describes it, as resembling that of the passing of air through a brazen tube, meaning thereby, I presume, the hard and sharp sound of a trumpet. But I suspect too great stress has been placed on its shrill sound ; and that writers, since Dr. Home, have been too obsequious copyists. My own observation justifies me in stating, that the sound of the voice first impresses the mind with the idea of a great degree of

hoarseness, and as though it stuck to the fauces, requiring an unusual effort to utter it, and when it is thus forcibly uttered, it is always hard, and generally of a sharp or shrill sound. But it sometimes seems to consist of a hoarseness and sharpness blended together; that is to say, there appears to be a hoarseness, from the apparent difficulty of uttering it; and when thus forcibly uttered, it is hard and sharp. The maiden lady before mentioned, totally lost the power of vociferation, being able only to whisper, apparently from the extreme dryness of the trachea.

3. THE countenance may be at first either florid or pale, according to the nature of the attending fever; but neither of these appearances is peculiar to the croup. But if, as soon as the dyspnœa becomes very distressing, the countenance puts on a livid or strangulated appearance, exhibiting at the same time some degree of bloatedness, these appearances, if accompanied by the two first mentioned diagnostics, may be considered as truly pathognomonic. And,

4. If amidst the foregoing distressing symptoms, the deglutition remain free and unimpeded, this circumstance amounts nearly to proof positive, that the disease in question is the croup.

THE croup is distinguished from every other species of quinsy, by the absence of inflammation in the internal fauces, and by there being no impediment to swallowing. Whereas in the

other species of quinsy, the mumps excepted, the internal fauces are inflamed, and there is great difficulty in deglutition; for the soreness of the parts is such, that the attempt to swallow even a little liquid, is painful; and the liquid after passing into the nose, greatly disturbs the patient.

BUT the croup more nearly resembles a paroxysm of spasmodic asthma, in which the breathing is much the same. But it may be distinguished by these circumstances: the asthma is a chronic disease, returning by paroxysms, and leaving an interval of many hours between them, and is unattended by fever, especially in the beginning of the disease.

THE four diagnostics above mentioned, are deemed sufficient to ascertain the presence of the croup, and when combined unequivocally, to distinguish it from all other diseases. I say, when combined; because, as in matters of jurisprudence, when several witnesses meet in the same case, and their testimonies agree, they corroborate each other, and their joint testimony is deemed conclusive. So in the case before us, it is the concurrence of these symptoms, not any one of them taken alone, which renders them completely pathognomonic; because they are not found thus combined in any other disease.

HAVING endeavoured clearly to point out those different circumstances in the concomitant symptoms, *especially the fever*, which imperiously de-

mand our particular attention in the treatment of each individual case, together with the general state of the patient, on which this difference depends; and having likewise brought to view those unequivocal marks, by which the disease may be easily and certainly known: I shall proceed to drop a few words respecting its mode of attack, its progress, and its termination.

THE mode of attack is various in different subjects. It sometimes makes its approach in a slow insidious manner, beginning like a common catarrh, attended by some cough, and a slight difficulty of breathing; which symptoms may run on gradually increasing, for two or three days, before the disease shall become distinctly marked. But at other times its attacks are more rapid and sudden, requiring but a few hours from the first appearance of indisposition, before it shall be completely formed. But however equivocal or diverse be its mode of attack, its symptoms, after the disease shall have been fully formed, will be the same.

THE progress of the disease likewise varies: for in some cases its extreme violence may induce a fatal suffocation in twenty-four hours; but such cases do not often occur. But if it do not yield to the remedies employed, it most commonly runs on, from three to five days, and sometimes longer.

ITS termination likewise is as diverse, as its accession, or its progress. But in order to form

a correct idea how this diversity is brought about, it will be proper to notice the several changes which, in the course of the disease the symptoms undergo.

THE fever, which, in the first stage might have been a true synocha, will, nevertheless, as the disease progresses, and the strength of the patient becomes worn down, put on the form of typhus. And the pulse, which, in the inflammatory stage was full and strong, now, as the last mentioned circumstances take place, becomes weak and quick ; and as the fatal period approaches, it is scarcely perceptible ; while the extremities, losing their former warmth, are bedewed with a cold sweat. The mental powers, likewise, which in the first stage were unimpaired, now suffer a great deprivation. And the extreme restlessness, and frequent coughing, which formerly greatly harrassed the patient, now, as the sensibility becomes exhausted, likewise abate ; till at length, the patient becoming more and more insensible of what he undergoes, apparently lies easier ; whilst respiration, becoming more difficult, and the patient less conscious of the need of it, is not so frequent ; till at last, death like a friend comes and relieves him from all his sufferings. Sometimes, however, the scene closes in quite a different manner. For the irritability may be such, that the high degree of dyspnœa, together with the extreme distress for breath occasioned by it, may throw the pa-

tient into profuse sweats, and induce convulsions, the immediate precursors of dissolution.

OF THE MORBID APPEARANCES AFTER DEATH.

NUMEROUS and highly respectable are the authorities, which agree on the following statement of facts.

1. THAT, on laying open the trachea of children who die of the croup, there is frequently, but not in all cases, found a preternatural substance resembling a membrane, of various thickness and tenacity, lining its inner surface, and generally adhering very slightly to its inner or mucous membrane. But in some cases this substance lies so very loose, that it can scarcely be said to adhere at all. Whilst in other instances it is found occupying the whole length of the trachea, and extending into the branches of the bronchiæ.

2. THAT, in adults, this preternatural substance has not been found: but instead thereof, there has been discovered an uncommon dryness of the inner surface of the trachea, with strong marks of inflammation.

3. THAT, in those cases of children, in which this preternatural substance is wanting, there is usually found a considerable quantity of very tough mucus, mixed with a pus-like matter, occupying the cavities both of the trachea and bronchiæ.

4. THAT, in those cases of children, in which this membranous substance forms a part of the disease, this mucous and purulent matter is found lodged in a greater or less quantity between this preternatural substance and the mucous membrane of these parts.

5. THAT, on removing this membranous substance and the mucous and purulent matter under it, no marks of ulceration are to be found; but that the traces of inflammation are generally very apparent. And that cases have occurred, in which no appearances of inflammation could be discovered: But that such cases are very rare.

6. THAT the lungs, in some cases discover no marks of disease; in other cases they exhibit all the morbid appearances observed after pneumonia.

7. AND that small polypous concretions are often found in the large pulmonary arteries, and in the right side of the heart. But they are said never to occur, after this disease, either in the left ventricle, or in the aorta, which are generally found nearly empty.

OBSERVATIONS.

UNDER this head, I shall attempt the outlines of the ratio symptomatum, and also an explanation of some of the morbid appearances of the parts on dissection.

FROM a retrospective view of these symptoms and appearances, I am induced with Dr. Home and others, to believe, that the seat of the croup is the mucous membrane and glands of the trachea, and that the disease itself consists in an inflammation of these parts, and its consequences. This position is confirmed by the testimony furnished by dissection: For evident marks of inflammation of the parts were discovered in all the cases over which the dissector's knife had passed. It is stated, indeed, that in certain cases no inflammation could be found; but the same statement adds, that there was lodged in the cavities of the trachea and bronchiæ a quantity of very tough mucus mixed with a pus-like matter. Now it is well known, that purulent matter may be produced without any ulceration: but it is equally clear, that it cannot be produced without inflammation. The existence, therefore, of pus in the trachea, affords as conclusive evidence that inflammation had preceded its formation, as the swelling and redness of the parts. In those cases in which no inflammation could be discovered by dissection, it is probable the inflammation had been removed by the means employed; but the patient had become so reduced, by the use of these means, and by the violence of the disorder, that he was rendered unable to dislodge these offending materials from the cavities of the trachea and bronchiæ, and fell a victim to their oppression, after the inflammation had completely subsided.

AN inflammation of the trachea having taken place, it most commonly occupies its upper part, but may extend itself throughout its whole length, even into the branches of the bronchia.

OF THE EFFECTS OF AN INFLAMMATION OF THE TRACHEA.

IN discussing the effects of tracheal inflammation, I shall consider, first, its effects on the solids; and, secondly, its effects on the secretions of the part.

1. OF the effects it produces on the state of the solids of the inflamed part. These effects, it is presumed, are similar to those produced by other local inflammations, some of these are the following: The vessels of the inflamed part become unusually distended, and many of the capillaries, which, in their healthy state contain a colourless fluid only, now become gorged with red blood; and there is deposited likewise in the cells of the tela cellulosa an unusual quantity of serous fluid; hence the swelling and redness of an inflamed part.

BUT such is the nature of inflammation, that, whilst the changes in the state of the part, just mentioned, are taking place, it likewise effects an important change in the sensitive organs of the part. But in what manner this change is produced, we know not; but its effect is a morbidly increased sensibility of the part. Hence the unusual tenderness or soreness of an inflam-

ed part: for soreness consists in morbidly increased sensibility.

And furthermore, the distension or stretching of the fibres, whose sensibility is thus morbidly increased, occasioned by the swelling, produces the pain attending inflammation. And these circumstances of swelling and tenderness acting together, and occasioning a kind of immobility or stiffness in the part, prove the cause of that impediment to the motion of the part, which we observe in all considerable inflammations.

These being some of the effects constantly produced by inflammation let us apply this doctrine to an inflammation of the trachea.

The inner surface of the trachea becoming inflamed, the following changes in the state of the parts will take place. The mucous membrane and glands will become thickened or swelled, while the deposition of a quantity of serous fluid in the cells of the adjacent parts will further increase the tumefaction. The swelling of the parts thus produced, together with the soreness always accompanying inflammation, will occasion a degree of immobility in the motions of the vocal organs; whereby they will be rendered unable readily to adapt themselves to the position necessary to give the proper sound; and the same thickening of the lining membrane, by diminishing the capacity of the trachea, will render the passage of the air to and from the lungs more difficult: hence the laborious respi-

ration, and the peculiar wheezing sound with which it is performed, in the croup.

IF we may be allowed to judge from the analogy between the vocal organs and wind instruments of musick, we shall be led to conclude, that whatsoever narrows the cavity of the glottis or upper part of the trachea, whether it arise from the thickening or swelling of its lining membrane occasioned by inflammation, or from the lodgement of a quantity of viscid mucus in its cavity, or from the formation of a preternatural membranous substance there, will have the effect to give to the voice a sharp or shrill tone. Agreeably to this we observe, that the position of the vocal organs, which gives the peculiar tone to the female voice in singing, consists in spreading the roots of the tongue, and so closing the larynx, as to leave but a very small aperture for the passage of the air, which gives to the female voice a pitch or tone an octave above the natural voice of a man.

AND the immobility of the vocal organs, whether it arise from their tumefaction, their soreness, their rigidity or dryness, will have the effect to require an unusual effort in uttering the voice; and the voice when thus forcibly uttered, will of necessity be always harsh or hard; whilst the extreme dryness of the parts may totally suspend the power of utterance.

2. WE shall in the second place, inquire into the effects of tracheal inflammation on the secretions of the part. These effects will be

various, like those of other local inflammations. For it may either suspend, or augment secretion in the part.

FIRST, cutaneous inflammation suspends perspiration, as appears by the dryness of the skin of the inflamed part. Visceral inflammation likewise suspends secretion, which is evinced by the cohesion of the parts which often takes place: for the cohesion of these parts is owing to the defect of the secretion of that mucus, which in health is designed not only to moisten their surfaces, and cause them to slide over each other without attrition, but which, likewise, effectually prevents their cohesion. And there can be no doubt, that those cases of croup in adults were cases of this kind, in which, neither mucus nor any preternatural membranous substance was to be found in the trachea; but instead thereof, the mucus membrane was observed to be much inflamed, and uncommonly dry, secretion having been suspended on account of some peculiarity in the condition of the secretory vessels.

BUT in the second place, inflammation under a different modification of the secretory organs, is likewise observed greatly to augment secretion in the inflamed part. Examples of this occur, in cynanche maligna, in scarlatina anginosa, and in ptyalism from the exhibition of mercurials: in which cases the inflammation of the fauces and glands is accompanied by such an increased action of the secretory vessels, that

the slaver is observed to flow in almost a continued stream.

THESE different effects, which other local inflammations appear to produce on the secretory organs of the part, namely, that of sometimes suspending, and at other times of augmenting, the secretion, appear, likewise, to take place in tracheal inflammation. Thus, in the case of adults, secretion seems to be suspended, as appears from the parts being found inflamed and dry, as was before mentioned; whilst in children the inflammation appears to augment secretion, as is evinced by the large quantity of viscid mucus, with which the cavities of the trachea and bronchiæ are found on dissection to be loaded.

But whether inflammation suspend or augment secretion, one other effect, I believe, it never fails to produce, if secretion be not wholly suspended, and that is, it always vitiates the quality of the fluid secreted, by rendering it different from that which nature designed it to be. And this vitiated or altered state of the secreted fluid may probably consist in its being rendered, either too thin and acrid, or in its becoming too thick and glutinous. Thus in catarrh, the defluxion to the nares will sometimes be so thin and acrid, as to inflame, and even excoriate the parts over which it passes: whilst that to the fauces and bronchiæ will be so viscid and tough, as to require strong and repeated efforts, by

coughing and hawking, to dislodge it. This is further exemplified in the inflammation produced by the application of blisters ; from which the discharge is sometimes limpid as water ; at other times it is moderately viscid ; whilst now and then it is so tough, as to form a coat of such tenacity, as to be capable of being peeled off entire, like a piece of skin.

SOMETIMES the secreted fluid is rendered so extremely glutinous and tough, in the croup, as to resist the feeble efforts of a child to dislodge it. In this case it must remain spread on the inner surface of the trachea, exposed to the drying effects of a current of air passing over it at every breath ; by which means, its more aqueous part constantly escaping by evaporation, the residue is continually acquiring a greater and greater degree of consistence, till, at length, it becomes gradually converted into a solid, and forms that mysterious substance, which has been denominated a preternatural membrane, whose inner or concave surface will be the driest and hardest, because it is exposed to the action of the air ; whilst its outer or convex side will remain moist and more soft, by its exclusion from the air, and by the new supplies of viscid materials, which, as the secretion still goes on, are constantly deposited betwixt this substance and the mucous membrane ; and by which means also, this substance is detached from the mu-

cous membrane, and lies loose in the trachea, ready to be discharged, by the efforts of puking and coughing.

DRS. HOME AND MICHAELIS maintained the opinion, that this preternatural membrane constitutes the very essence of the croup, and is the cause of all its peculiar symptoms. Accordingly the latter of these gentlemen in his treatise on the subject, denominated the disease, *angina polyposa sive membranacea*, a name very appropriate; had this opinion been correct. And though the researches of Dr. Home were highly meritorious, and his discoveries most important; yet we are to remember, he was human. For his opinion, we have reason to believe, has been the cause of great perplexity to the medical world, till further inquiry had discovered the truth. For when a physician had a fatal case, strongly marked, by the most distinguishing croupy symptoms, if, on examination of the body, such a substance was not to be found in the trachea, he was at a loss what to call the disease; for by this criterion, it could not be the croup. This led to another opinion no less erroneous, namely, that the croup and cynanche trachealis are two distinct diseases. It is much to be regretted, that authors of acknowledged abilities should name a disease from some incidental circumstance, not essential to the disorder.

ORDINARY and easy respiration is performed in this manner: Inspiration is performed by enlarging the cavity of the thorax, and thereby giving the air an opportunity, by its own gravity, to rush in through the trachea, and inflate the lungs, by whose expansion the cavity of the chest thus enlarged, is exactly filled; for there can be no vacuum in the chest. And this enlargement of the cavity of the chest, is chiefly effected by the contraction of the diaphragm, which draws it downwards towards the abdomen, and thus enlarges the cavity of the chest: so that the perpendicular diameter of the abdomen is shortened, as much as that of the chest is lengthened, in inspiration. And expiration is effected by lessening the cavity of the chest, which expels just as much air from the lungs as the capacity of the chest is diminished. This diminution of the capacity of the thorax is effected partly by the relaxation of the diaphragm, but chiefly by the contraction of the abdominal muscles, which forces the diaphragm upwards into the cavity of the chest, and thus diminishes its capacity.

BUT in the croup, when the passage of the air to and from the lungs is much obstructed by the diminution of the cavity of the trachea, and the patient is in great distress for breath, the intercostals, and every other set of muscles, which can assist in raising and expanding the chest, and thus enlarging its capacity, are called into

action. And these several powers, by their joint and vigorous effort, do expand and enlarge it sufficiently for a full inspiration. But the obstruction to the passage of the air is so great, that the lungs become but partially inflated. And this partial inflation of the lungs, not being sufficient to fill the cavity of the chest thus enlarged, the diaphragm, whose contraction being overcome by the violent effort of the other contracting powers, is forcibly drawn upwards, contrary to its ordinary motion, into the cavity of the chest, to diminish its capacity; because the quantity of air inhaled, was not sufficient to fill it, it being impossible as was before observed, to leave a vacuum in the chest. And this retraction of the diaphragm into the cavity of the chest, occasions a remarkable depression or sinking of the scrobiculus cordis and hypochondria, at each inspiration.

AND since as great an effort is required to expel the air from the lungs, as there was to inhale it, the obstacle being the same, the abdominal muscles violently contract themselves to force the diaphragm upwards, and by thus diminishing the capacity of the thorax, to expel the air from the lungs. And this violent contraction of the abdominal muscles compresses the viscera and forms them into a prominent tumour nearly in the centre of the abdomen, at each expiration. And these motions of the abdomen, though not noticed by any writer whom

I have consulted, yet, appearing to be constant attendants on all the cases of the croup, which I have witnessed, they are deemed of too great importance to be passed over, in ascertaining a case of this disease.

THE same diminution of the cavity of the trachea, which occasions the dyspnœa, the wheezing, and the great commotion of the abdomen in respiration, and gives to the voice its peculiar croupy sound, occasions, likewise, a partial collapse of the lungs, which takes place in consequence of their not being duly inflated by each inspiration. And this collapsed state of the lungs proves an impediment to the free passage of the blood from the pulmonary arteries into the pulmonary veins; and this impediment gives occasion to an undue accumulation of blood in the pulmonary arteries, a state favourable to the formation of polypous concretions: for two circumstances are necessary to the production of these concretions, namely; a surcharge of blood, and an impediment to its free motion. And this constant distention of the pulmonary arteries will prove an obstacle to their receiving the usual quantity of blood from the right ventricle, by its contraction, whereby this ventricle cannot be completely emptied, but will remain partially filled with blood after each systole. And the right ventricle remaining partly filled with blood, will disqualify it for receiving, during its diastole, the usual quantity from the right

auricle ; consequently the blood will remain unduly accumulated in both of these cavities, which will not only favour the production of these concretions in those cavities also, but likewise prove an obstruction to the passage of the blood from the vena cava into the right auricle ; for this auricle, being constantly full, and able to discharge its contents but in small quantities, can receive the blood from the vena cava but slowly, which will prove a remora or clog to its motion in this last mentioned canal also ; by which means the current of blood in the veins will be stemmed quite up to their capillary origin. And the impetus of the blood in the capillaries being too feeble to remove the obstacle thus opposed to its motion, these vessels in the last place will likewise become over-distended ; the effects of which will be, a livid or strangulated appearance of the countenance, with some degree of bloatedness, which will pervade every part of the whole surface of the body or the whole capillary system. To elucidate this position I would observe, that, though the sudden distention of the capillaries by the arterial or red blood, will produce a blush ; yet their gradual distention and the blood remaining partially stagnant in them as just mentioned, it will acquire its dark or venous hue ; and it is the distention of the capillaries by this black blood, which gives the livid appearance. And one circumstance more tending to increase the lividity,

is the dark colour which the whole mass of blood acquires in the croup, by means of the defective chemical process performed in the lungs, of which more hereafter.

AND as this strangulated appearance of the countenance depends on a state of the vital organs, similar to that of actual suffocation, it always affords an unfavourable prognosis. For the danger may generally be estimated, by the degree of lividity thus produced.

IT is stated, that dissection could discover none of these concretions either in the left ventricle or the aorta ; but that these cavities were found, after the croup, nearly empty. Here it will be proper to bear in mind a proposition before advanced, that "two circumstances are necessary to the formation of these concretions, an accumulation of blood, and some impediment to its free motion ;" to which I will now add, that without the concurrence of the two circumstances, these concretions cannot be formed.

Now the same cause which occasioned the accumulation in the pulmonary arteries, namely, the difficult passage of the blood through the lungs, will effectually prevent this circumstance from taking place in the pulmonary veins, in the left ventricle, and in the aorta. For in proportion to the obstruction to the free passage of the blood through the lungs, will be its accumulation in the pulmonary arteries ; and in the same proportion will the pulmonary veins be depriv-

ed of their customary supply from the pulmonary arteries. And as the veins receive, in a given time, say, from one systole to another, but a small quantity of blood from their correspondent arteries; so, of consequence they can transmit but a proportionately small quantity to the left ventricle, which can throw only the same paucity into the aorta. Hence it appears, that the above mentioned accumulation, without which these concretions are never formed, cannot take place, either in the pulmonary veins, in the left ventricle, or in the aorta: and therefore these concretions cannot be formed in these cavities. And furthermore, as a total collapse of the lungs takes place, on respiration becoming extinct; and as no blood, or at most but a very small quantity, can pass the lungs after their total collapse; and lastly, as the heart is known to act for a short space after respiration ceases; these circumstances clearly account for the left ventricle and the aorta being generally found nearly empty. But these last mentioned circumstances are not peculiar to the croup: they take place commonly, in a greater or less degree, in almost all other diseases. For we observe, that as the subject, whether man or beast, approaches the fatal period, respiration suffers a great interruption, and is less frequent, till at length, it becomes extinct. And, by a law of the animal economy, which Bichat denominates the contractibility of tissue, as respiration declines, a

collapse of the lungs commences, accompanied by a proportionate obstruction to the free circulation through them. By these means an accumulation in the pulmonary arteries, &c. takes place in the manner above described, which gives occasion to the formation of those concretions in the right ventricle, auricle, and large pulmonary arteries, which are often found, not only after the croup, but also after many other diseases. For the collapsed state of the lungs, which begins with the interruption of respiration, goes on increasing as this declines, till respiration ceases. In like manner the pulmonary veins, and consequently the left ventricle of the heart, being deprived of their customary supply of blood, this privation keeps pace with the increasing collapse of the lungs, till the collapse is complete, and the circulation ceases. And as the quantity of blood received by the left ventricle is constantly diminishing; so the quantity thrown into the aorta must become less and less, and the pulse will become proportionably smaller and weaker, till the quantity of blood thrown into the aorta becomes too small to reach the extremities, when the pulse will become imperceptible, which cessation of the pulse generally takes place some little time before the action of the heart entirely ceases. These circumstances, together with that of the heart's continuing to beat for a short space after respiration becomes extinct, account for the empty

state of the left ventricle and the aorta, after death, which are circumstances common to all diseases which terminate fatally, in a slow gradual manner.

BUT the collapsed state of the lungs above mentioned, needs some explanation. I would not be understood to mean by it, their perfect collapsion, as in the fetal state. For it is well known, that after the lungs have been once fully inflated, the greatest effort of expiration cannot expel the whole of the air from the bronchiæ, but a small portion of it will remain in the bronchial cells, which will prevent their total collapsion. But that which I would be understood to mean, is, that such a degree of collapsion takes place, in consequence of the lungs not being inflated, as proves an impediment to the free passage of the blood through them. And do any doubt the truth of the position, that the collapsion of the lungs proves an impediment to the free passage of the blood through them? Bichat, by sundry experiments seems to disprove it; but in the sequel he virtually acknowledges its truth, by conceding, that, in all cases attended by difficult respiration before death, the lungs are found unusually gorged with blood. If it be not true, why did nature, who does nothing in vain, make provision for carrying on the circulation through the foramen ovale in the fetal state, whereby the blood goes immediately from the right to the left ventricle, without pass-

ing through the lungs? Was it not, because the whole volume of blood could not pass through the lungs in their collapsed state? The truth appears to be this: a certain portion of the blood may pass the lungs in their collapsed state: but their collapsion, nevertheless, proves an impediment to its free passage, whereby an accumulation in the pulmonary arteries, and a proportionate paucity in the pulmonary veins, are occasioned.

It is an established principle with physiologists, that oxygen gas or vital air is indispensable to the support of animal life. For whatever be the chemical operation carried on in the lungs by respiration, whether the oxygen becoming absorbed, and united with the blood, give to it its bright and scarlet colour, and endow it with its vivifying and exciting qualities; or whether, by chemical attraction it abstract from the blood its carbon formed in the course of circulation, and uniting itself with it, be converted into carbonic acid gas, and thrown out by expiration; these are questions whose discussion does not necessarily fall under the present inquiry. But the indispensable necessity of the admission of a certain portion of oxygen gas into the lungs, in order to support life, and the consequences of the total absence of it, as well as of its admission in a quantity too small to answer the exigencies of the animal economy, are subjects immediately interesting to the present investigation.

IN regard to the quantity of oxygen gas necessary to support life and health, the results of different experimentalists are not exactly the same; though, all circumstances considered, they do not so widely differ, as might be thought at first glance. I shall therefore take as the standard, that of Sir Humphry Davy, whose accuracy and acumen are unquestionable. According to his researches, a middle sized man ordinarily respire about 216,685 $\frac{1}{4}$ cubic inches of common atmospheric air in 24 hours. This quantity, allowing 100 parts of common atmospheric air to contain 21 parts of oxygen gas, which is the common estimate, will give 45,504 cubic inches of oxygen gas. But on account of some trifling circumstances best known to himself he was induced to fix his calculation at 45,500 cubic inches of oxygen gas in 24 hours, weighing about 15,500 grains, = 2 lb. 8 oz. troy weight; and that, on an average, about 31,6 cubic inches of oxygen gas are usually consumed by a man in a minute.

THE effects of a total obstruction to the admission of oxygen gas into the lungs are these: the chemical process in the lungs is instantly suspended, and the blood passing into the pulmonary veins, is conveyed to the left chamber of the heart in its black and venous state, (except it be a little reddened by a small quantity of oxygen gas remaining in the lungs when the obstruction took place,) and is thence thrown through the

whole aortal system, and thus caused to penetrate every organ of the body. And as the black or venous blood is destitute of those vivifying and exciting powers, which the red or arterial possesses, the several organs soon experiencing its paralyzing effects, their several functions cease, and death ensues. That great experimental Professor, Bichat, treating of the manner in which the death of the lungs produces the death of the other organs, says, "I believe, on the contrary," (i. e. in opposition to the opinion of Dr. Goodwyn,) "that in the interruption of the chemical phenomena of the lungs there is a general affection of all the parts; that the black blood, driven every where, carries weakness and death to every organ that it enters; that it is not from their not receiving blood, but from their not receiving red blood, that each organ ceases to act; and that in a word, all are then penetrated by the material cause of their death, namely, black blood." *Researches*, Part II. Art. VI. § 2.

So likewise, by parity of reasoning, when the quantity of oxygen gas admitted into the lungs is too small to answer the several exigences of the animal economy, it may indeed support life for a while; but the several functions must be carried on in the interim in a very imperfect and debilitated manner. Accordingly, we find by the records of distinguished experimental chemists, that the first symptom supervening on a deficiency in the quantity of oxygen gas in

the respired air, is a disposition to drowsiness ; and as the deficiency increases, laborious respiration and universal distress manifest themselves. Mr. Ellis and Dr. Higgins observe, that debility, convulsions and death, follow the successive diminution of the oxygen gas, long before the whole of that gas is consumed. See Ellis's Inquiry. Minutes of a society, &c. page 160.

THESE observations being premised, let us apply the doctrine to the case before us. And here the mechanical obstruction opposing the passage of the air into the lungs, being the diminished capacity of the trachea, is such, as may reasonably induce us to suppose, that not more than one half, and sometimes perhaps not a third part, of the usual quantity of air is inhaled into the lungs, by respiration, in the croup ; consequently but a proportionate quantity of oxygen gas can be admitted, and the chemical process will be but in that ratio performed ; and of course the animating and invigorating effects derived from respiration will be in the same proportion : or, in other words, a degree of debility proportionate to the deficiency of oxygen gas inhaled, must be induced. And the excitement of the several organs, by the blood thus deteriorated, must be in the same ratio diminished. The energy of the brain, therefore, being thus reduced, the patient will fall into a dozy state, bordering on insensibility ; the action of the heart, being in the same degree debilitated, the

pulse will become weak and obscure ; the sensitive organs suffering in the same manner and degree, sensation will be equally obtunded, and the patient becoming unconscious of that restlessness and distress, which, in the first stage of the disease greatly agitated him, he will lie apparently calm and easy ; and lastly the moving powers suffering an equal privation, the patient will appear in a very debilitated state, seeming scarcely able to move a hand or a foot. And on these principles that remarkable change in the symptoms of the croup, from the inflammatory to the typhoid form, which is observed to take place, as the disease advances, may, I conceive, be rationally explained. And I would ask, may not the paucity of oxygen gas received into the lungs, and the proportionately deficient chemical operation carried on in them, during the whole course of the disease, be a principal cause of this change, and of the great prostration of every power and faculty attendant on the last stage of the disease ? This remarkable change in the symptoms is most conspicuous in those cases, in which the first or inflammatory stage exhibits the marks of great general excitement, which, as has been before observed, depends on a proportionate degree of bodily strength and vigour. But in those cases in which the patient labours under great constitutional debility, and the symptoms in the first stage put on the typhoid form, this change in the symptoms cannot

be so apparent. But even in these debilitated cases, observation will discover, that the prostration of every power and faculty is much more rapid, in the croup, than that which usually occurs, from the debilitating effect of disease simply considered. Hence we may justly conclude, I conceive, that the excessively debilitating effects of the croup, are to be attributed to the paucity of oxygen gas inhaled, and the consequent imperfect or deficient chemical operation performed in the lungs.

THE PROGNOSIS.

MANY of the circumstances, which, in the croup, portend danger, were noticed as I went along. It may not be improper, however, to exhibit a collective view of them, which I shall present in an aphoristical form.

1. IN the beginning or first stage of the disease, if the concomitant symptoms be of the low, depressed, or typhoid kind, there is much reason to fear an unfavourable termination, because, in these cases the patient does not so well bear, nor receive so much relief from, the necessary evacuations.

2. IF the patient do not bear the depleting measures, it affords an unfavourable prognosis.

3. IF the cough, which, in the first stage was frequent and troublesome, abate in the advanc-

ed stage, whilst the dyspnoea remains unabated : or,

If the great restlessness and distress attending the first stage, abate in the advanced stage, and the patient appears to lie calm and easy, whilst the dyspnoea suffers no diminution : or,

If the mental powers, which, in the first stage were free and unimpaired, become depressed in the advanced stage, and the patient sinks into a drowsy state bordering on coma, whilst the respiration remains as difficult and laborious as before : either of these circumstances are of fatal omen ; for they do not denote an abatement of the disease, but the loss of sensibility.

4. If the dyspnoea be great, and the means employed do not relieve it, no flattering appearances which may take place, can be relied on.

5. THE danger will generally be in proportion to the degree of dyspnoea and the strangulated appearance of the countenance.

OF THE METHOD OF TREATMENT IN THE CROUP.

THE result of the foregoing inquiry leads to the following conclusions : that the croup primarily consists of an inflammation of the mucous membrane of the trachea, which extends likewise to the mucous glands of the part. And that, in consequence of this affection, there becomes deposited in the cavity of the trachea in children only, and sometimes likewise in the

bronchiæ, a quantity of viscid mucus and other offending materials, which, if not dislodged, may prove fatal, even after the inflammation which occasioned the deposition, shall have completely subsided. The indications therefore, which I shall propose, are two :

1. To remove the inflammation : and
2. To dislodge those offending materials deposited in the trachea and bronchiæ.

THE inflammatory diathesis consists in an undue fulness and tension of the vessels : and it may be general, or local. When the inflammatory diathesis pervades the whole system, strong marks of general excitement appear, as a florid countenance, a full and strong pulse, great heat and thirst, and the fever attending it is always a synocha. When it is local, and confined to a particular part, it occasions very little general excitement, and the countenance will be pale, the pulse weak and small, the heat and thirst but little increased, and the fever will be of the typhoid form.

I. To answer the first indication, the means are those which deplete and relax the system ; such as, venesection, emetics, cathartics, blisters, and the warm bath.

IN order that venesection may have the greatest effect possible, in depleting and reducing the tension of the system, and thereby removing inflammation, it should be conducted in the following manner. The blood should be drawn

suddenly, from a large orifice, made as near the part affected as possible, and the blood suffered to flow till some marks of deliquium supervene. I have generally preferred the external jugular in cases of croup, and I perform the operation in this manner: Lay the child horizontally on its side, in the lap of an assistant, with the upper side of its neck and shoulder bare, its head a little depressed, and held steady by another assistant, its hands likewise being kept out of the way. Then placing the thumb of the left hand on the vein to prevent the loose skin from giving way before the point of the lancet, and holding the lancet in the right hand, so as to form an acute angle with the surface of the skin, plunge it into the vein a sufficient depth, bringing it out, not by drawing it back, but by tipping out its point, so as to make the orifice in the skin at least as large as the opening in the vein, which will effectually prevent the blood from forcing its way into the cellular substance and forming a thrombus. If the vein should not fill, make the child cry, and that will fill it immediately. . The bad work sometimes made in blood-letting, must apologize for these minutiae. After a sufficient quantity is thus taken away, the finger applied to the orifice, and held upon it for a minute or two, will generally stop the blood, when a compress of dry lint applied to the orifice, and a bandage over it, and passed slightly round the neck, will

generally secure it. In opening the jugular, if we do not make the opening deeper and larger, than we should deem necessary in the arm or ankle, such is the loose and spongy texture of the part, that we shall find ourselves disappointed in procuring a free discharge of blood.

IN these cases of croup, in which the fever is of the typhoid form, known by the pale dejected countenance, by the weak, quick, or obscure pulse; and by the small degree of heat and thirst, and other marks of general debility; if we take away blood at all, we should do it with great precaution, and very sparingly, lest we should thereby increase the existing debility to such a degree, as should render the patient unable to discharge the offending materials deposited in the trachea, which if not dislodged, might prove as fatal as the inflammation itself. For the same reasons, in the advanced stage of the disease, after such a degree of debility shall have been induced, as shall have changed the febrile symptoms from the inflammatory, to the typhoid form, blood-letting has not been observed to be useful, and cannot be recommended. Under such circumstances it will be safer to trust to the other means about to be proposed.

IN those cases of the croup, in which the febrile symptoms hold a middle rank, between the two extremes above described, we should use the lancet, but it should be done with some

precaution. Blood should be taken away in proportion to the degree of the febrile symptoms, and to the strength of the patient. It should be drawn early in the disease, but not before the febrile symptoms have somewhat increased, nor after they have put on the typhoid form.

2. Of emetics.—Emetics are better adapted to the typhoid form of the disease, than to the highly inflammatory variety. But they answer both of the general indications, by cleansing the stomach, determining to the surface, and equalizing the circulation; and thus they prove both antispasmodic and febrifuge: And they are decidedly the most powerful means of dislodging any noxious materials from the cavities of the trachea and bronchiæ. They should be plied vigorously, and repeated as often as the strength of the patient will bear, till the disease abates, say, once in 12 or 24 hours.

If the patient be strong and vigorous, I commonly take equal parts of tartris antimonii and submuriæ hydrargyri, adding to them a sufficient quantity of hot water, and of loaf sugar enough to keep the submuriate suspended till it can be swallowed. Of this I give a quantity, which I consider to be a middling dose, and repeat it every half hour, till it operates freely as an emetic, or proves cathartic. After it shall have operated sufficiently, I exhibit a dose of tinct. opii. camphorat. to allay or obviate

any spasmodic affection, which the dyspnœa and distress has, or may induce. And if the emetic shall not in a reasonable time prove cathartic, I exhibit a proper dose of calomel to move the bowels freely.

BUT the tartrate of antimony, as an emetic, is proper only in the first stage of the croup: nor is it safe in this stage of the disorder, unless the patient possess a good degree of bodily strength and vigour. For since writing this dissertation, subsequent observation has furnished the author with one very important fact, respecting the effects produced by the exhibition of a large dose of tartar emetic in certain cases which, at that time, he had not noticed. It is this: If tartrate of antimony be exhibited in a large dose, to a debilitated patient, in whom such a degree of torpor of the stomach has taken place, as to prevent it from producing any evacuation, it will act as a deleterious poison: for a most surprising prostration of strength will speedily follow, in which the muscles seem to have lost their tone, the patient appearing to be scarcely able to move a hand or a foot, whilst the energy of the brain appears to have suffered an equal privation; for the patient will lie in a state bordering on insensibility; a state from which he will be very fortunate if he recover. Similar effects from the tartrate of antimony the author has witnessed in more instances than one. For he knew a famous irregular

practitioner, whose practice it was, in the advanced stage of typhus, if the tongue was loaded and the skin dry, to put down a large dose of tartar emetic, with the view of cleansing the stomach and bringing on a diaphoresis, which, as he supposed, would break the fever: and as the stomach in these cases is generally pretty torpid, he frequently had occasion to repeat it, but often without producing any vomiting, but what was forced, by tickling the throat with a feather. The consequence of this practice was, the patients generally fell into a state similar to that just described, from which they seldom recovered. I return to the treatment of the croup.

If the patient be feeble in the beginning, or shall have become so, in the course of the disorder, we must make use of a more mild emetic adapted to the strength. For this purpose a strong preparation of oxymel scilliticum per se, or with the addition of a portion of the subsulph. hydrargyri flav. or ipecacuanha with from half a grain, to a grain and an half of the last mentioned mercurial, will be the best; which should be repeated according to the violence of the disease, and as the strength of the patient will allow; the object being to push the operation vigorously; as there is no time to be lost.

3. Of Cathartics.—Cathartics, though better depletives, and consequently better calculated to reduce simple inflammation, than mere emetics; yet as emetics seem to answer both of the

general indications, they claim the preference. But during the inflammatory stage especially, if the emetic do not operate downwards, it should be followed by some kind of cathartic, of which calomel seems to be the best. During the course of the disorder, it is of importance to keep the bowels open, to avoid costiveness. And to answer this purpose the castor oil is well calculated. It may be exhibited at any time in a quantity sufficient to answer this purpose, except during the operation of the emetic.

4. Of Epispastics.—These are of great consequence in removing the local inflammation, and should in no case of the croup be omitted. After bleeding, if proper, and once puking, a blister should be applied to the fore part of the neck, extending half round it. If the wheezing seem to proceed from the lungs, the front and sides of the chest should likewise be blistered. I think that blistering the chest was the means of saving one of my patients.

5. Of the Warm Bath.—The warm bath acts by exciting torpid vessels into action, by soothing the tender fibres painfully distended by inflammation, and by thus equalizing the circulation proves the most speedy assuager of the pain of local inflammation hitherto known. It will procure a temporary mitigation of the distress in croup; but how far it will contribute towards effecting a radical cure, must be left to future experiments to determine.

II. THE second general indication proposed, was, to dislodge those noxious materials deposited in the cavities of the trachea and bronchiæ. This is a very important indication, because, if this be not answered, though we should be able completely to remove the inflammation, the patient must sink.

THE most effectual means of answering this indication consists in repeated puking, and in promoting expectoration by keeping up the cough. To excite coughing, I know of nothing equal to the polygala senega, which may be exhibited in decoction, after the manner of Dr. Archer, or in a fine powder mixed with lac ammoniacum, or a syrup of squills. My common practice, in the intervals between puking, consists in exhibiting the seneka in one or the other of these forms, every two or three hours, interposing between each dose, a moderate quantity, say, from one to three grains of submuriate of mercury, to act on the glandular system. If in any stage of the disorder the coughing ceases, while the dyspnoea continues unabated, I give from three to five grains of the fine powder of seneka, or of Ipecac. with from one to two grains of the yellow subsulphate of quicksilver, to promote a moderate puking; as a substitute for the deficient coughing and expectoration, omitting at this time the submuriates. I have never known a troublesome ptyalism to follow the free use of

mercurials exhibited in this manner. The diet should be sparing, consisting only of the liquid kind, and the drink should be some emollient pectoral infusion.

There is one article more, which, as some people deem it a specific in the croup, it may not be improper to mention, which is the adeps boicingæ, or rattle-snake's oil, as it is called. In support of its great efficacy and penetrability, it is alleged, that being rubbed on the throat, it soon becomes distinctly tasted in the mouth. To this effect from its external application, I can add my own testimony; but whether the effect be produced by its penetrating to the internal fauces, or by its effluvia being inhaled with the breath and lighting on the papillæ of the tongue, I am at present unable to determine. From its extremely fishy and nauseous taste, it certainly will produce puking, and, I think I have witnessed its good effects. It is given to a child in the quantity of about a common tea-spoonful, by itself, and in half an hour, or an hour, according to the intention of its exhibition, it may be safely repeated.

In the advanced stage of the croup, when the circumstances mentioned under No. 3, of the prognosis supervene, might not the inhalation of oxygen gas, frequently repeated, invigorate the debilitated system, and help to restore the diminished sensibility, and thus prove an important auxiliary in the cure? The foregoing investi-

gation, to say the least, will fully justify in the author's opinion, our giving it a fair trial.

A BRIEF HISTORY OF A FEW CASES OF CROUP.

NOTE,—In the following cases, where it is not otherwise particularly expressed, a moderate dose of elixir paregoric, as it was formerly called, was always exhibited after venesection, emetics, cathartics, and at bed-time, to obviate spasms, to relieve the distress, and to procure rest; and in the intervals between the operation of evacuants, from one to three grains of calomel, according to the age of the patient, were prescribed, to be repeated every three or four hours, according to the urgency of the symptoms, till the disorder should abate. Notwithstanding this free use of calomel, I have not met with a single case of troublesome ptyalism, resulting from it. In regard to venesection, it does not appear very important from what part the blood is taken, provided the necessary quantity be abstracted suddenly, by a large orifice that will let the blood flow in a full stream. Consequently, to obviate that horror with which mothers are often struck, at the idea of opening the jugular, I have, where the circumstances appeared favourable, generally taken the saphena.

CASE I.

SEPT. 4th, 1795. A child 3 years old. The respiration very laborious, with wheezing; ac-

accompanied by great commotion of the abdomen; some cough, with a sharp sound of the voice; the countenance flushed, with a strangulated appearance; the pulse full, strong, and considerably increased in frequency, and the heat and thirst proportionate, with great restlessness.

BLOOD was taken copiously from the ankle, which greatly relieved the dyspnœa, and the general distress.

IN two hours an emetic of tartrite of antimony and submuriate of quicksilver was exhibited, which operated freely, and so far removed the remaining distressing symptoms, that the child had a good night.

5th. THE dyspnœa, fever, and other symptoms having chiefly subsided, a cathartic of equal parts of calomel, jalap, and crystals of tartar, was ordered; which operating well, the child recovered according to our wishes.

CASE II.

Nov. 4th, 1796. A child 3 1-2 years old. Great dyspnœa, with much wheezing, which seemed to extend into the chest, with great abdominal commotion; the countenance pale and dejected, with a pallid lividity; vociferation difficult, and the voice when uttered, either by coughing or speaking, hard and sharp; the heat moderate; the pulse quick, small and obscure.

As the child discovered strong marks of general debility, it was thought expedient to omit the use of the lancet, though the case appeared alarming.

An emetic was ordered ; but, from the timidity of the mother, the operation was not so full, nor so often repeated, as it ought to have been ; blisters were applied on each side of the trachea ; as the bowels inclined to costiveness, they were kept open by castor oil and injections ; and in the intervals, small doses of calomel, and a decoction of seneka, were ordered to be given alternately ; but, on account of the disagreeable taste, she took but little of the latter. And thus she went on for three days, without any abatement of the disease.

On the 3d day, her case being viewed as nearly desperate, a large blister extending from the clavicles, to the lower part of the sternum, and occupying nearly a third part of the chest, was applied, and the course above mentioned, continued. The result was this : as soon as this blister vesicated and discharged, the dyspnoea and every other distressing symptom gradually abated ; so that, in two days more, every croupy symptom subsided. The blisters being beset with ulcers, were extremely painful, which greatly reduced her ; but by the free use of bark and other restoratives, she recovered in about a fortnight.

CASE III.

APRIL 6, 1797. A child 22 months old, of a very gross habit, violently attacked; dyspnoea distressing, with much wheezing, and great abdominal commotion; the countenance suffused, with a bloated and strangulated appearance; pulse full and strong, and the heat and thirst much increased; vociferation difficult, and the sound of the voice, whether by coughing, or crying, hard and sharp, with constant restlessness.

ALL attempts to find a suitable vein in the ankle or arm were fruitless; I therefore turned to the jugular, which I opened without difficulty; the blood flowed copiously, till marks of faintness supervened, and the child puked once, which greatly frightened the anxious mother, but as greatly relieved the distressed child.

In about an hour after the exhibition of the paregoric, I gave the antimonial tartrate and calomel mixture, which vomited the child very freely, and passed downwards twice. These operations so far removed the complaint, that, aided by a mild pectoral tea for drink, with the paregoric at bed-time, the child had a good night. By continuing this course for two days longer, assisted by *ol. ricini* occasionally exhibited, so as to keep the bowels open, the child recovered without the use of any other remedies, and without further trouble.

CASE IV.

JUNE 4th, 1782. A lad between seven and eight years of age, having been much fatigued, by riding horse to plough in a hot day, ate his supper and went to bed, apparently, in good health. He slept in a garret against an open window ; and the weather turning remarkably cool in the night, he awoke towards morning in great distress for breath, complaining of much uneasiness in the fore and upper part of his neck, just below the roots of his tongue, which, he said, did not interrupt his swallowing, but seemed to choke him, as he expressed it.

BEING called on in the morning to visit him, I found him labouring under the symptoms of a well marked violent croup. On inspecting the internal fauces, neither tumour nor inflammation could be discovered. The countenance was flushed, and somewhat livid ; the general excitement was very considerable, the pulse full and strong, and the heat much increased ; the dyspnoea was distressing, accompanied by wheezing, and abdominal commotion ; utterance difficult, and the sound of the voice was hoarse and hard, but not shrill ; and there was some cough, which was not urgent.

BLOOD was taken freely from the ankle, which in some degree relieved the dyspnoea. After a short respite, an emetic of the antimomial tartre with calomel was exhibited, which, operat-

ing copiously gave still further relief. This was followed by two grains of calomel every four hours, interposing half a common table spoonful of the following mixture between each dose: take of lac ammoniacum ʒij . oxymel scilliticum ʒj . and elixir paregoric ʒij . mix.; a mild pectoral tea for drink.

JUNE 5th. The symptoms in some degree mitigated; but respiration remained laborious, with too much heat and thirst, and a full and strong pulse.

VENESECTON, and the emetic, repeated as yesterday, and the other remedies continued, with the addition of an epispastic applied to the fore part and sides of the neck, and a tea spoonful of adeps boicingæ interposed every six hours.

JUNE 6th. The symptoms greatly relieved. But there was observed an uncommon rattling in respiration, as if something hung loose in the trachea. In the course of the day, the patient brought up, by coughing, several pieces of a skinny substance, much resembling the skin peeled off from the under side of a boiled neat's tongue, some of which were more than an inch in length, and nearly half an inch in width. The calomel and pectoral mixture were continued for two days more; at the end of which, every croupy symptom had subsided, leaving a very slight affection only of the mouth, from the liberal use of the calomel.

CASE V.

Nov. 1st, 1806. I was called in the evening, to a child at the breast, 12 months old, who appeared to labour under all the symptoms of a well marked and violent croup. Respiration was very laborious, and performed with wheezing; when the child coughed or cried, it seemed to be with difficulty, that it could make a noise; but when uttered, the sound was sometimes hoarse and hard, and at other times squeaking and sharp; the pulse was pretty full, and increased in frequency, and the heat augmented. The countenance was flushed, and exhibited the strangled appearance.

THE child's mother then gave the following history of the case. She said, she was holding the child in her lap, about noon that day, and eating chestnuts; and the child looking wishfully after them, she put some of the nut that she had chewed, into the child's mouth, several times, which it swallowed with apparent avidity; at length, as she was thus feeding it, the child coughed as though it was choked. The difficulty of breathing instantly commenced, and has been increasing ever since. She was afraid some of the nut had gone the wrong way.

THE manner in which the disease came on, and the whole history of the case, afford reason to conclude, that the mother's fears were too well

grounded ; notwithstanding I could discover no difference between the symptoms of the present case, and those of a common well marked croup.

Is the present disorder a case of croup? If it be not such a case, what is to be done? I reasoned thus with myself: the formation of a preternatural membranous substance, in the croup, depends on a preceding inflammation of the trachea; but the introduction of an extraneous substance into the trachea, and its remaining there, must occasion such inflammation, which will reduce the two cases to the same nature. The symptoms cannot be much different, and the indications must be the same, namely, to remove or obviate inflammation, and to dislodge, if possible, the offending material from the trachea. As the state of the febrile symptoms evinced a considerable degree of inflammation from some cause; and being unable with certainty to determine from which cause it might arise; I resolved to treat the present complaint, as a case of croup.

I therefore took blood freely from the ankle, which, for a while, appeared considerably to mitigate the dyspnœa. After a short respite, I gave an emetic, which, though it operated kindly and freely, seemed to afford no essential relief. This was followed by small doses of calomel, and the decoction of seneka, exhibited alternately, as usual in the croup.

NOVEMBER 2d. The symptoms generally aggravated, but more especially the dyspnœa, and the strangulated appearance of the countenance. On reflecting that venesection gave but momentary relief, and that puking afforded none; I was confirmed in the opinion, that the difficulty arose from the lodgement of an extraneous body in the trachea; and viewing the case as nearly desperate, I resolved to try the effect of puking with adeps boicingæ. I therefore gave a tea spoonful of it by itself, and repeated it every half hour, till the child puked several times: and at length the child discharged, while puking, a solid piece of a chestnut, consisting of about a quarter part of a whole nut; on which the dyspnœa immediately abated, every distressing symptom soon subsided, and the patient recovered without further trouble.

CASE VI.

JUNE 1st, 1811. A child at the breast, ten months old, and extremely corpulent, was violently attacked by the croup. Distressing dyspnœa, much wheezing, with great abdominal commotion; countenance flushed and strangulated; utterance difficult, and the voice hard and shrill; heat increased, with a full and strong pulse; some cough, with great restlessness, &c.

I took blood from the jugular vein, till paleness and some faintness supervened, which much relieved the dyspnœa and other distressing symp-

toms. After a short respite, the antimonial tartre and calomel mixture was exhibited, which, puking her copiously, and passing downwards twice, so far annihilated the remainder of the disease, that a course of small doses of calomel alternated with small doses of paregoric, continued for 24 hours, and followed by a cathartic, completed the cure, without the use of any other remedies.

WE should be more intelligible, perhaps, in speaking of the croup, if we were to divide the disease into two stages, the inflammatory, and the typhoid. Keeping this distinction in view, I would observe, that I have been frequently called on for advice in cases, in which the disease, under a weak or inefficient mode of treatment had been suffered to run without any abatement, for three or four days, or till the second or typhoid stage had been fully formed. Under these circumstance, I cannot say, that I have known a single recovery; venesection has mitigated the dyspnœa, but the relief was generally temporary only; whilst the depletion increased the general debility, a circumstance most to be dreaded in this stage of the disease. Full vomiting often produces similar effects. As in this stage of the disorder, there is usually such a degree of torpor and insensibility induced, as renders the operation of emetics very precarious; we ought to be extremely cautious in the use of those of the dras-

tic kind, but more especially of that of the tartrate of antimony, for the reason heretofore given. In the typhoid stage, our chief reliance must be placed upon blistering, which should be largely employed, stimulant expectorants, such as seneka, squills, and the yellow oxyd of quicksilver. These may be exhibited with safety, so freely as to produce gentle puking occasionally, as the case may require.— To these may be added the use of the warm bath, and may I not add, the frequent inhalation of oxygen gas? But if the more efficient remedies have been omitted in the first stage, we can promise ourselves very little from the employment of any means whatever in the second.

THE END.