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A

TREATISE

ON THE

PNEUMONIA OF CHILDREN.

BY M. M. RILLIET AND BARTHEZ,

HOSPITAL INTERNES, MEMBERS OF THE ANATOMICAL SOCIETY AT PARIS.

Duo sunt præcipui medicinæ cardines, Ratio et Observatio: Observatio tamen est filius [illegible] dicip[illegible]bent medicorum ratiociniis.—Baglivi.

TRANSLATED FROM THE FRENCH BY

S. PARKMAN, M. D.

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PREFACE OF THE AUTHORS.

If we examine most of the treatises, which have been published upon the diseases of children, we shall find the authors to have attempted a description of those peculiar to childhood, rather than of the common diseases of humanity, as influenced by that age. We shall find, in their works, many dissertations upon certain symptoms created with morbid entities, or upon certain lesions, which, by their rarity, attract the attention of all observers, but few descriptions of the diseases which a daily practice presents. Within a few years, however, authors have begun to study the affections of children with particular reference to their pathology.

Numerous observations, and interesting memoirs, have been published in different periodical collections; young physicians have taken the subject for their inaugural dissertations. But from so vast a field, all has not yet been reaped; many important truths, scattered here and there, have remained lost for want of being incorporated with the body of science. A good book upon the diseases of children is yet to be written. Far from us the idea of pretending to undertake, at the present day, so great a labour. We leave it to hands more skilful and experienced than ours. But desirous of walking in the traces of those, who have preceded us, and of profiting by the advantages of our situation, we have thought to do something useful in studying this important part of pathology. We purpose, (if this undertaking be favourably received,) to publish a series of monographs upon the different diseases of childhood. A part of our material is already collected, but we wish to confirm, by new observations, the ideas we at present entertain.

Among the diseases of this age, those of the chest are, without doubt, both the most important, and the most numerous. We commence therefore with them. These present researches upon pneumonia will form the first part of a series upon the thoracic affections.

Before entering upon our labour, we ought to say a few words upon the method we have prescribed to ourselves in the performance of our undertaking, in order that the reader may appreciate the degree of confidence to be placed in our assertions. Situated

as internes at the hospital for sick children, we have collected a great number of facts. We have, particularly in the latter months of the year, taken observations upon all the patients admitted into the wards for acute diseases. Among these observations there are sixty pneumonias, the analysis of which forms the basis of this work. We might have operated upon a much greater number of facts, but we have preferred to content ourselves with the analysis only of those collected after a rigorous and continued examination of the chests of children in the normal state. Being then enabled to appreciate perfectly the comparative resonance of the different parts of the thorax, we can count upon the exactitude of our pathological researches.[1] Each particular fact has been collected with all possible care; the autopsies have been made with the greatest detail, and the alterations have been minutely described at the moment of the examinations. Our observations being collected, we have decomposed them into their different elements, in order to class, into as many distinct tables, the causes, symptoms, pathology, &c.; from each of these tables we have deduced propositions, the developement of which forms the base of this work. If we have thought ourselves obliged to proceed with rigour, in the analysis of our observations, if the numerical method has always served us as a guide, we will aver, that we have avoided, as much as possible, the filling our pages with figures and observations, which would have rendered their reading both irksome and laborious; we have rather preferred to postpone, till the end of the work, both the numerical tables and the observations, as vouchers destined to prove the assertions which we have advanced.

We have not contented ourselves with giving merely the result of our own experience, but have read and meditated upon the works of authors, who have preceded us, and we have taken the care to indicate the points, where their observations confirm ours, as well as where they are at variance.

We would not terminate this preface, without tendering our thanks to our masters, Messrs. Baudelocque and Bouneau, for the wise counsels given, and the affectionate goodness always manifested to us.

[1] The study of the normal state of the child's chest will form the subject of a separate monograph.

PNEUMONIA OF CHILDREN.

CHAPTER I.

HISTORY.

No where among the ancients, (as remarks M. Leger,[1]) do we find a description of the pneumonia of children: they hardly mention it, and if Stoll, Sydenham, Merten, Rosen, &c., say a few words upon it, it is only when supervening in the course of the eruptive fevers.

In 1823 appeared the first monograph, upon the pneumonia of children, a few years after the discovery of auscultation, without the aid of which its history could not have been given with success. M. Leger gave to the disease, he was the first to describe, the name of latent, a name deserved before his researches, but which it no longer merits, since, at present, its diagnosis is among the things certain.

M. Leger, after a careful examination of the causes, establishes the following divisions:

1. A latent acute pneumonia, with symptoms more or less well defined.

2. An acute pneumonia, without the usual diagnostic signs, without cough, dyspnœa, &c., but on the contrary simulating some other affection, not of the chest, or a meningitis.

3. A chronic pneumonia consecutive to an acute, or primitively chronic; and lastly, a pneumonia after measles. Twenty-eight observations terminate this dissertation, being divided into four series, after the divisions of the author; the greater part of the cases were in children, aged from two to four years.

This thesis, although very remarkable, leaves many wants to be supplied, many assertions to be corrected. The symptoms, principally the stethoscopic signs, are indicated rather loosely; many are passed over in silence; the pathological anatomy is very incompletely treated; the divisions are too multiplied, and the observations taken with little care.

After M. Leger, M. Lenerx,[2] in an inaugural dissertation, entitled, "The pneumonia of children compared with that of old men,"

[1] Thesis, 1823, No. 49.

[2] Thesis, 1825.

spoke of the mamellonated hepatisation peculiar to that organ. He described the granulations of vesicular pneumonia as like the tubercular, and he attributed them to chronic bronchitis. His thesis, although voluminous, was not equal to that of M. Leger, and, without any greater detail, contained a greater number of errors.

M. Leger had laid no great stress on a particular form of hepatisation, as frequent in children, although he mentioned it under the name of partial splenisation. Many pathologists sought to repair this oversight: thus in 1828, M. Berton[1] drew the attention of observers to the lobular form presented by this affection in children. He described its duration, the incertitude of the symptoms, insisted strongly upon the frequency of the termination by pulmonary abcess, and endeavoured to establish the diagnosis, between tubercular phthisis and lobular pneumonia.

M. Burnet published, in the Journal Hebdomadaire, (July, 1833,) some researches on this subject, and laid down the following propositions.

1. The non-complication of pleurisy:
2. The possibility of cure by induration.
3. Its attacking indifferently all parts of the lung.
4. The non-termination by suppuration.

The thirteen observations, appended to this memoir, leave much to be desired; most of them are deficient in detail, the auscultation incomplete, and the general symptoms and progress of the disease very superficially described.

One year later, M. de la Berge,[2] in a memoir based upon detailed observations, attempted a complete history of lobular pneumonia. He divided the disease into two periods—the sthenic, of short, and the asthenic, of longer duration. According to him, the treatment should be much influenced by these periods. The precision and exactitude of the descriptions of the morbid alterations of the lung render the pathological anatomy the most valuable part of this work.

Of the five observations terminating this memoir, three only are examples of simple lobular pneumonia, and, in these three, the disease is very limited, (seven or eight points only). Of the two others, there is a pneumonia of an entire lobe in the one and a pleuritic effusion in the other.

About this time, Dr. Gerhard published in the American Journal of Medical Science, (August and November, 1834,) some quite interesting remarks upon the pneumonia of children.

He divides his patients into two classes, those over, and those under, six years of age. He proves that, in the first class, pneumonia, taking place in otherwise full health, is not a grave affec-

[1] Thesis, 1828, No. 64.
[2] Journal Hebdomadaire, 1834, p. 414.

tion: in forty of his patients, only one died. He describes with care the symptoms, and discusses the influence of treatment.

In the second part of his memoir, he treats of pneumonia in children from two to six years of age, he demonstrates that in these the disease is never developed in perfect health; he insists upon the lobular form of the hepatisation and dwells upon the modification of the respiratory sound, and, after a careful description of the anatomical lesions, he finishes with a few words upon treatment.

His work, fruit of an attentive observation, and based upon an analysis of facts, is without contradiction the most valuable yet published. The author, nevertheless, treating exclusively of pneumonia when perfectly evident, has neglected its study, when the diagnosis, being more obscure, requires, in consequence, all the attention of the practitioner. Having laboured in the same field of observation, we have necessarily arrived at similar results, but we have thought ourselves called upon to modify some of his assertions, as well as to supply some of his deficiences.

M. Boudin,[1] in some researches upon the complications of measles, presented some remarks upon pneumonia. His observations are upon ten children from two to seven years of age, and offer nothing not contained in preceding publications. But we cannot pass in silence a very remarkable omission in this memoir; the author has neglected entirely to notice the existence of any peculiarity in the form of the hepatisation, not even mentioning *lobular pneumonia.*

M. Rufz,[2] has given, nearly verbatim, the memoir of Mr. Gerhard, to the composition of which he had assisted, in analysing a part of the cases.

M. Berton, in his treatise upon the diseases of children, has added nothing to the ideas already advanced in his inaugural dissertation.

M. Hourmann,[3] in a communication made to the Medical Society of Paris, described succinctly the pneumonia of children from two to four years of age. He states, from *six* autopsies, that the lobular form is far from being as common, as is usually supposed; he regards bronchial respiration as normal in children, disputes the utility of percussion, and terminates with an observation of recovery in a child, of two years, treated by repeated venesection, about a pound of blood having been taken.

Although we are noticing only works upon children from two to fifteen years of age, we cannot pass in silence a very interesting memoir, upon the pneumonia of infants, occupying one hundred and fifty pages in the work, just published by M. Valleix.[4] This is the result of an analysis of fifteen observations; an analysis made

[1] Thesis, 1835, p. 91.
[2] Journal des Connoissances Médico-Chirurgicales, 1835, p. 101.
[3] Revue Médicale, April, 1835, p. 137.
[4] Clinique des Maladies des Enfans Nouveau-nés, 1838.

with all the rigour of the numerical method. There are only three cases of simple pneumonia; in the others, it complicated other affections. The disease commenced by febrile agitation, heat, and acceleration of the pulse, followed by cough, dyspnœa, subcrepitous râle, bronchial respiration, and flatness on percussion commencing at the base of the lung.

The constitutional symptoms disappeared after a day or two, and were entirely wanting in the cases supervening on œdema.

After death, the hepatisation occupied the two lungs in the great majority of the cases. Ordinarily more marked in the right, than left side, more frequently presenting the lobar than the lobular form; the morbid tissue was always very hard and smooth upon incision.

After attentively reading all these monographs, we see that none except that of M. Leger, presents a complete picture of the pneumonia of children, while some treat only of the lobular pneumonia and of that variety revealed only by obscure symptoms; others in examining only the disease, when idiopathic, neglect entirely those numerous and important instances where it complicates other diseases.

CHAPTER II.

PATHOLOGICAL ANATOMY.

In the study of the anatomical lesions, authors have not endeavoured to establish the connections between the different species of the pneumonias of children; on the contrary, they have given us descriptions of each individual species, without attempting their union under one and the same head, as they would seem to require. We think also, they have too much neglected the examination of those alterations of the respiratory apparatus, which complicate pneumonia.

To present a complete picture of these morbid appearances, we shall describe each kind separately, pointing out as far as possible, its nature, and thus treat, in as many distinct paragraphs, of vesicular pneumonia or bronchitis, lobular pneumonia, lobar[1] pneumonia, of the state of carnification, and finish with a few words upon the disease after it has become chronic. We shall then study the alterations of the bronchial tubes, dwelling particularly upon vesicular bronchitis and enlargement of the bronchi.

We shall endeavour, in each of these articles, to establish the connections between these divers alterations, and finish this chap-

[1] The term lobar pneumonia will undoubtedly explain itself as given to the disease, invading the whole or part of a lobe, as in the adult. (P.)

ter by a succinct account of the concurrent alterations of other organs.

Vesicular Pneumonia.

The lung, externally, is flaccid and soft, collapsing, more or less, in proportion to the extent of disease. Upon incision, it presents a number of granulations of the size of a millet seed, of a gray colour bordering upon the yellow. At first sight, these might be mistaken for crude miliary tubercles disseminated through the lung, as we often see them in children: but a more careful examination shows a great difference, both in their physical qualities and their nature.

Tubercles form full and solid bodies: the granulations of pneumonia contain a liquid. Thus, upon incision, some tubercles, divided by the knife, present their cut surface on a level with that of the pulmonary tissue, while others, escaping before its edge, preserve their globular forms. These latter upon incision present the usual appearance of tubercle. The granulations of pneumonia, on the contrary, collapse in giving immediate issue to a drop of puriform liquid, and those which have escaped the knife remain whole and spherical.

If these latter be opened with the point of an instrument, there escapes the same puriform liquid, and in the centre we discover, though often with difficulty, a small depressed point, departing from which, we were, in one case, enabled to trace a small canal, a few lines in length, with a smooth internal surface, which was doubtless a minute bronchial ramification. There is nothing common then to these two alterations, save their form, general disposition and colour.

From this description it appears probable, that the disease is confined to the extremities of the bronchial tubes, and that a certain number of the pulmonary vesicles, becoming inflamed separately, are filled with this puriform liquid, and dilated without any inflammatory participation of the surrounding cellular tissue. Doubtless, this appearance of the lesion confined to the pulmonary vesicle has originated the name, vesicular pneumonia; but perhaps this appellation is improper, since the inflammation is confined to a single element of the pulmonary tissue; we would therefore prefer to call the disease, vesicular bronchitis.

If it happen, that many vesicles, in the vicinity of each other, are affected, the connecting tissue may participate in the disease, from which results a little mass, sometimes attaining the size of a lentil, presenting, on incision, several of the granulations, or several of the depressed points, which appearance, except this modification from the granulations, is the lobular pneumonia to be presently described. There in fact exists, in such a case, vesicular bronchitis surrounded by lobular pneumonia.

In other instances, the pulmonary tissue, surrounding the dilated

vesicles, is evidently and generally hepatised, and then we have vesicular bronchitis surrounded by lobar pneumonia.

The bronchi, leading to the diseased portion of the lung, are sometimes dilated, sometimes healthy; the former of which conditions will be fully noticed in a further part of this work.

Lobular Pneumonia.

Lobular pneumonia is an inflammation occupying one or more isolated lobules. It has been described under the names, mamellonated, partial, disseminated. Its frequency and its gravity make it deserving of an attentive examination.

Externally, the lung is usually soft and flaccid, of a grayish rose colour, more or less deep, presenting scattered spots of a violet red, generally clearly circumscribed, projecting, solid to the touch, and not collapsing like the surrounding portions of the lung. These spots, usually circular, sometimes elongated, especially from above downwards, are chiefly situated at the posterior border of the lung, but they are found, also, in all parts; sometimes they are absent, and nothing abnormal is visible, but the finger detects the presence of nodosities more or less deeply imbedded in the tissue.

Upon incision, we find the lung marbled, by a rosy gray, and a deep violet red colour; the exterior red spots correspond to the deep-coloured parts of the interior; and these spots, as well as the others below the surface, form nodules of engorgement, presenting the characters of ordinary hepatisation, viz. smooth to the knife, granulated upon tearing, easily penetrated by the finger, and sinking in water. But to establish this latter characteristic, it is necessary to isolate perfectly the diseased portion, and to select especially the centre. Upon pressure, there is little or no crepitation; and there is exuded a sanious liquid, with small bubbles of air, but if we be careful to press only the centre, the liquid issues without the air, as in common lobar pneumonia.

We meet with this species of pneumonia at the first, second, and third degrees.

Then, upon incision, we have the pulmonary tissue marbled, of a red or rosy gray, the red parts more or less regularly limited, a little less resistant than the surrounding tissue, still swimming on the surface, with whatever care we may isolate them, exuding upon pressure a liquid entirely penetrated with air, and still crepitating under the finger. This is the first degree.

The second we have already described.

The third presents itself under so insidious a form, as, without particular attention, to be easily overlooked at the autopsy. And as, during life, the physical signs are frequently absent, it is easily conceivable that the disease may be undiscovered, and considerable uncertainty be thrown upon the cause of death.

Thus, when the points of inflammation are small in size, and have passed entirely from the second to the third degree, the dis-

eased tissue becomes grayish, and presents very little difference from the surrounding portions. The reader will therefore easily conceive, that if it requires a careful attention to establish the existence of a lobular pneumonia at the second degree, how much more is necessary to recognise it when arrived at the third stage, where the peculiar colour, the most common of the marks, has disappeared.

But if we pay proper attention, we cannot fail of remarking, that in the track of the incision certain lobules are projecting, the vesicles not collapsing as in the surrounding portions, and that pressure in these lobules gives issue to a liquid, rather purulent than serous, after which we may easily establish the existence of the other characteristic signs.

This description of the three stages of pneumonia, written with the preparations before our eyes, and which is very nearly a compend of the opinions of all the authors upon the subject, does not appear to us, however, to give a perfect idea of the pathological anatomy and the progress of the disease. We have thought that we have observed two forms of the lobular pneumonia, the one perfectly circumscribed, which we would call mamellonated, the other not so clearly limited, to which we would give the name of partial. In giving these names we would not be understood as thinking to describe two distinct diseases; we consider them only as two forms of an identieal affection, having a common origin, but a different progress; finishing by presenting some modifications of the symptoms, and of which the partial is an intervening stage between the lobular and the lobar pneumonia.

The mamellonated pneumonia forms a nodule of inflammation, the colour and appearance of which contrasts strongly with the surrounding tissue. It is a point of pneumonia perfectly limited, thrown into the midst of a tissue nearly or quite healthy, and its boundaries are clearly defined, even when the surrounding textures are engorged. It may even happen, as we have seen in one subject presenting about a dozen of these nodules, that the boundary is marked by a circle, or rather by a white resistant spherical capsule, of about an eighth of a line in thickness, and presenting a fibrous aspect. Usually, the line of demarcation, besides the change of colour, is indicated by the collapse after an incision of all the surrounding parts.

The size of these nodules varies from a hemp-seed to a pigeon's egg; their border is generally regular, representing a sphere, or some analogous figure, and their number varies from one in a lung to twenty, thirty, or even more.

The partial pneumonia, on the contrary, is less well defined than the mamellonated; its circumference is insensibly confounded with the surrounding textures, without any distinct demarcation, either by change of colour or protuberance of the diseased part; its volume, often greater than in the mamellonated form, is, however, sometimes the same: its form is not always regular, the inflamma-

tion extends itself in different directions, and is either every where advanced to the second degree, or the centre is alone so, while the circumference has only attained the first.

In this latter case it may happen, that a part of one nodule, still at the first stage of inflammation, connects itself with several other points of pneumonia, and we have the whole or the greater part of a lobe inflamed and presenting the characteristics of the first and second degree, scattered without any apparent order through its substance.

Upon these considerations, we establish the two forms of lobular pneumonia, one resulting from an inflammation of one or more individual lobules, without any tendency to attack those adjacent; while the other is the consequence of an inflammation developed in one group of lobules, gradually involving all the surrounding ones. In the first case, the inflammation, if we may use the expression, is centripetal, concentrating itself in the lobules primitively affected. While in the other it is centrifugal, tending to spread and attack all around it.

Hence the explanation, why the mamellonated pneumonia may suppurate and form an abcess, while the partial form tends to become general or lobar. But that these are only modifications of the same form of the disease, is proved by an observation which we possess, where one side presented the mamellonated pneumonia at the stage of suppuration, and the other the partial form tending to become general.

In these two cases, the following is the state in which we find the lung affected:

If the mamellonated pneumonia have passed into the stage of suppuration and abscess, an incision presents to us little cavities, in form and disposition answering to the lobular hepatisation at the second degree. Their volume varies from that of a hemp-seed to that of a large pea. These cavities are filled with pus, mingled at times with clots of blood; they communicate sometimes with the bronchi, and at the point of entrance of the bronchus into the cavity, the mucous membrane ends abruptly, presenting the appearance of a solution of continuity, quite evident to the sight, and shown by the formation of strips, if the caliber of the bronchus admit of this method of examination. Many of these abcesses, however, do not communicate with a bronchus, but are surrounded by it, in this manner proving that the interior of a bronchus was not in these cases the point of departure of the inflammation.

We insist strongly upon this latter remark, because it is necessary to distinguish carefully these abscesses, which are rare, from another more frequent lesion, to be hereafter described, the dilatation of the bronchial extremities. One character which will aid us in seeking this distinction, is, that the parietes of the dilated cavity are smooth, polished, and gradually continuous into the bronchial tube, whilst in the abscess they present quite a different aspect, the bronchus being seen to open abruptly into the cavity.

If the lobular pneumonia, already become general, have passed to the third degree, we observe it as entirely lobar, and an incision presents an aspect which all will recognise from the foregoing descriptions: those points which were at the first stage will have reached the second, while those at the second will have attained the third. The texture will be marbled, with a mingled red and yellowish gray.

There is, however, a difference between a lobar pneumonia and a partial pneumonia become general, which consists in the different disposition in the lung at the different stages of the disease. Thus, in common lobar pneumonia, the disease, commencing usually at the base of the lung, advances upwards; and, whilst the base passes to the second degree, the parts above are attacked in the first, and thus in succession: while in the other case, the disease, having commenced in distinct lobules, presents its different stages scattered without order through the lung.

This consideration may serve to determine, in the dead subject, if a pneumonia was primitively lobular or lobar; not universally, however, as the pneumonia, in becoming general, may have remained at the second degree, thus imitating perfectly one originally lobar.

But even in this case, as in the preceding, we usually find in the same lobe, or in the same or opposite lung, some distinct lobules, inflamed in the second degree, constituting the remains of a defined lobular pneumonia, cases which have hitherto been regarded as a union of the lobar and lobular pneumonias,—added to all which, a careful study of the symptoms during the patient's life-time, will materially aid the diagnosis of the two lesions before us.[1]

The anatomical proof of the existence of a lobar pneumonia is much rarer in children than adults; for, in general, before five years of age, idiopathic pneumonia seldom exists, and after that age the disease is seldom fatal.

Nevertheless, in cases of death from some complication, we have seen a sufficient number of such autopsies to convince us that the lesion is the same at both these periods of life.

[1] It may be well to mention here a form of pneumonia of children pointed out by M. de la Berge, under the name of the marginal. It often happens in reality, that we find hepatisation slight in extent, seated around the base or on the anterior border of the lung; these hepatisations perfectly resemble ordinary inflammations in their pathological alterations, and physical characters. The circumstance of the seat and slight extent of the disease suffice to attract attention. Its symptoms are inappreciable, and we may find its cause in the feebleness of the child and the want of reaction in the pulmonary organs; allowing those parts most distant from the centre of the circulation to become engorged. For we are not to think that it is from an excess of vitality that the lungs of children inflame—reasoning thus, the lungs of old men should have the same attributes of superior vital force, judging from the frequency of pneumonia; besides, in children we ought to observe it attack with preference the most vigorous and most healthy, whereas the reverse is the more general rule.

To the distinction of some authors, founded upon the smooth surface presented by an incision of the inflamed portion, we attach no great importance; since, even when the texture is smooth under these circumstances, it is not the less granulated upon tearing.

After this description of the different forms of the acute pneumonia of children, we pause a moment to remark, that all these lesions are only varieties of the same affection, without any special peculiarity attached to either; since from one to the other there is but a step, and since one can easily transform itself into the other.

In truth, commencing with the capillary bronchitis, of which we shall soon speak in detail, we next arrive at the vesicular pneumonia, or rather bronchitis, which is an evident extension of the first, and thence to the true lobular pneumonia, the transition state being in those cases where the vesicular bronchitis is surrounded by a lobular pneumonia. Besides, all the authors upon this latter species of pneumonia have endeavoured to establish it as a consequence of a bronchitis; for this propagation of inflammation from one tissue to another is easily conceivable, and by it alone we might explain the development of lobular pneumonia. In reality, the final bronchial ramifications, being independent one of the other, we easily conceive how the inflammation propagates itself by isolated lobules; and the whole, therefore, reduces itself to this, that childhood, more than any age, is disposed to capillary bronchitis, or to the affections consequent upon it; and having before shown the passage of the lobular into the lobar pneumonia, we have completed the series of the pulmonary inflammations of children.

Beginning with capillary bronchitis, advancing to vesicular bronchitis, to lobular, and finally lobar pneumonia, we find the only difference between these diseases to be in the greater or less extent of the inflammation.

We must, however, guard ourselves against too great a generalisation of these ideas, involving, as a consequence, the opinion, that in the child all the inflammations of the lung commence by the capillary bronchitis, and pass successively through all the degrees above described; it will be shown at a later period of this work, that pathological anatomy, on the one hand, does not furnish the means of positively recognising the existence of the bronchitis; while on the other, in the greater number of pneumonias, especially the lobar, the bronchitis is not of sufficient extent, and the constitutional symptoms appear too suddenly to allow of the supposition of this propagation of the inflammation from one tissue to the other.

We would only wish then to establish the existence of these varieties, the small distance which separates them, and the easy transmigration of one to the other.

To complete, then, the description of our views upon the pneumonia of this age, it only remains to speak of two kinds of alteration of the texture of the lung, distinct, and yet offering, perhaps,

some analogy one with the other: we refer to carnification of the lung and chronic pneumonia.

Carnification.

The former of these alterations, though somewhat frequent,[1] has never been described by authors, and is merely alluded to in a note to the memoir of M. Rufz. The description, given by him, is however exact, and agrees perfectly with our observations.

The lung, in this state is, externally, collapsed, soft, and flaccid, instead of full, hard, and resistant as in pneumonia. Its colour is violet, marbled by white lines, disposed in losenges or squares, defining the lobules, without any crepitation upon pressure.

An incision presents a texture of a red colour, smooth, resisting the pressure of the finger, so as to be penetrable with considerable difficulty; exuding upon pressure a serous bloody liquid destitute of air. Its appearance very like the close compact fibres of a muscle has given it its name.

The carnification occupies often the circumference of the base of one of the lungs, being then marginal, or else some portion of a lobe: the middle lobe is the only one we have seen entirely invaded; whilst at other times it affects the lobular form, appearing in distinct and separate circumscribed masses.

From this we see that this lesion affects the peculiar seat of each species of pneumonia, never, however, involving any considerable quantity of lung. It exists besides in subjects presenting at the same time the lobar and lobular pneumonias.

The first idea, presented to the mind by the examination of this tissue, is the resemblance to a lung of a fœtus which has not yet respired; the vesicles of which have not yet dilated, under the thoracic expansion, to admit the air into their interior. Or we might think them to have been obliterated by some disease, an inflammation perhaps, the engorgement having disappeared, without leaving the vesicles the power of returning to their former state of dilatation.

With these views, we might regard the carnification as a sort of termination of pneumonia or as that disease in a chronic stage. In fact we possess an observation which would justify this idea; it is of a child, presenting for a long time the signs of a pneumonia of the right side, and dying finally of the disease invading the left; the autopsy showed a considerable carnification of the right lung, at those points where the auscultation had previously established the existence of a pneumonia.

Chronic Pneumonia.

Authors are by no means agreed upon what we ought to under-

[1] See table of the Pathological Anatomy.

stand by the chronic pneumonia of children, and to show how confused are their ideas upon this subject, it will be sufficient for the reader to know, that some consider it very frequent, while others regard it as very rare.

M. de la Berge speaks of the yellowish gray colour as marking the change to the chronic state; but we can regard this only as indicative of the third stage of the disease in children, as is admitted on all hands in the adult; and we must have something besides colour to characterise the passage to the chronic state.

We have never met with any lesion which might be regarded as chronic pneumonia, unless it be the carnification just described: we shall not attempt therefore any description of this affection.

Tubercles.

Tubercles, so common in youth, might naturally be expected to present themselves frequently with the pneumonia of children, nevertheless they are very rare.[1] Our results agree perfectly with those of Gerhard and Rufz, although we would not as yet agree with the latter in the conclusion that measles ought not to be considered a cause of tubercles: the question merits a separate attention and does not form part of our subject.

We have observed tubercles in fifteen of forty-three antopsies. In three cases they existed in other organs besides the lungs, in the bronchial or mesenteric glands; in the other cases their number was small: they appeared to select the superior lobe; and twice we found them at the extremity of a dilated bronchus, and twice in the centre of a lobular pneumonia.

Here terminate our remarks upon the pathological anatomy of the pneumonia of children; we shall refer hereafter[2] to the comparative frequency of each of these affections in the different ages; but we have thought it might be useful to connect with the preceding descriptions some account of many other alterations, which, mingling their symptoms with those of the pneumonia, merit for that reason a careful examination.

The Bronchial Tubes.

We have made the bronchi a subject of particular attention; we have noted carefully their caliber, the colour, thickening, and softening of their mucous membrane, as well as the liquids contained in their cavities.

Caliber.—Most of the authors have spoken of the dilatation of the bronchi, but without insisting sufficiently, we think, upon this lesion, which must be so frequent, since we have found it in one

[1] We would be understood not to speak of those more frequent cases where the tubercles being the principal disease are complicated by pneumonia, but only of those instances where the pneumonia is the primitive lesion.

[2] Vide table of Pathological Anatomy.

quarter of the cases terminating fatally. The dilatation of the bronchi affects two forms, quite distinct and apparently the result of the difference of seat; the lesion is sometimes in their course, and at others in their extremities.

In the first instance the scissors, instead of entangling themselves in the walls of the bronchi, easily follow the smallest branches and arrive immediately at the surface of the lung. Upon laying open the bronchus in the whole of its length, we see it, from one of the first divisions preserving throughout the same diameter, or even perhaps insensibly increasing it. In some cases the dilatation, appearing suddenly at some point in strong contrast with the volumn of the bronchus from which it springs, continues so throughout the whole extent. Sometimes the dilatation appears only in the smaller bronchi, which have then but a slight though perceptible increase. We have never seen the spindle-shaped form of dilatation in which a bronchus dilates and contracts again almost immediately, in a manner to simulate a small cavern.

Only two cases have presented a thickening of the walls of the bronchus; in one of these it was tripled, and might have been regarded as chronic with relation to the concomitant disease. The dilatation sometimes has invaded a large part of the lung; in other cases we observe it limited to a space not exceeding a small egg.

In all the cases except one, the dilated bronchi were surrounded by diseased tissue, either hepatisation or carnification; in one case we found only a vesicular emphysema without any inflammation.

If the bronchi be dilated in their extremities, the incision of the lung presents a surface strewn with a number of little cavities, communicating with each other, and with the bronchi of which they appear the continuation.

The communication of one with the other is made through an opening in a simple membranous partition, or by means of a cylindrical canal apparently a dilated bronchus, and which often furnishes branches themselves involved in the same disease. It may happen, however, that these channels of communication are yet in the normal state.

The greater part of these cavities are surrounded by the lung, but in some instances existing at the surface they are merely enclosed by the pleura, forming externally a small protuberance, and collapsing immediately upon puncture, in this manner simulating emphysema. These little cavities contain the same liquid as the bronchi, their parietes are smooth, thin, and lined by what is evidently a continuation of the bronchial mucous membrane.

This is the alteration liable to be mistaken for the little abcesses of lobular pneumonia, but we have already pointed out the diagnostic differences between the two.

We have now to decide if the dilatation of the bronchus be consequent or precedent to inflammation of the parenchyma. Although

difficult of decision, it has seemed to us that the dilatation has either commenced at the same time with the pneumonia, or been developed in its course, as by the physical signs we have never detected any symptoms anterior to those of the pneumonia. Its formation is, perhaps, entirely mechanical, from the sojourn of an abundant mucous secretion in the bronchial tubes. A supposition strengthened by the absence of any thickening of the parietes of the bronchial tubes thus affected.

Colour—Thickening—Softening.

The alterations of the mucous membrane, as demonstrating their inflammatory state, merit a very peculiar attention.

We are not to think, however, that an inflammation can be as easily demonstrated here as in the intestinal mucous membrane. The conditions of the two cases are widely different, for, 1st, the simple section of the lung covers the mucous membrane with blood, so as to require a careful washing, to arrive at proper conclusions of the colour; and 2d, the bronchial tubes, becoming thinner and more transparent in proportion as they become finer, allow the subjacent tissue to impose its own colour upon that of their mucous membrane.

We are driven therefore to a careful examination of the appearances furnished by the formation of strips; now these strips although easily obtained in bronchi of any size, are no longer so when the caliber commences to lessen, even before it has become capillary. In this case then, the tenuity of the vessel opposes itself to any elucidation, by this means, of the pathological anatomy.

Nevertheless we have thought ourselves justified in admitting the existence of a capillary bronchitis, whenever we have found a redness equally diffused in the mucous membrane in spite of a different colouration of the subjacent tissue, and more especially when the liquid in these bronchi was abundant.

We have established, yet but rarely, the softening and redness of the mucous membrane by the aid of the formation of strips; but in the great majority of cases these lesions have escaped us, and we are compelled to acknowledge that the existence of the capillary bronchitis can seldom be proved by pathological anatomy.

Liquids in the Bronchi.

As yet these have not attracted any particular attention, and although we have made them the subject of a particular study, our examinations upon this point have been by no means complete.

We find, however, noted in our observations the greater or less abundance of these liquids, and the presence or absence of air in them; we find it often remarked, also, that the mucus was grayish, thin, not viscous, puriform, or else the contrary, viscous, whitish,

purely mucous; and these remarks have assisted us in the explanation of certain stethoscopic signs.

But we would have wished to have been able by more detailed observations to determine the relations of the different species of inflammations, the bronchial dilatation and the abundance of liquid, with its consistence, its tenuity, and its mixture with air; we would have wished to see if in the same lung the mucus were more abundant where inflammation is seen to have existed, than where, although the eye after death detects no alteration of the tissue, auscultation has indicated the existence of râles during life; if there may exist mucus in the bronchi without pneumonia or capillary bronchitis, &c. To answer these questions, it would be necessary to decide if the decubitus of the body upon the back determine the gravitation of the fluids to that part. All these details, at present left incomplete, will be the object of future study.

We may nevertheless endeavour to determine whether abundance of mucus be a necessary proof of an inflammation of the bronchi. Upon this subject we are of opinion, that a bronchitis cannot be admitted unless we have the existence of the mucus; that its presence, in any quantity, however great, by no means establishes the bronchitis, for we have seen the fluid where it was impossible to admit an existence of this latter,—a fact easily conceivable, considering the great weakness of children, which prevents the expectoration of the mucosities, and allows their accumulation upon the surfaces normally secreting them.

Larynx—Trachea—Large Bronchi.

Inflammation of these organs in connection with pneumonia is not frequent. We have twice seen erosions upon the inferior vocal chords; in one there had been measles with hoarseness, in the other entire loss of the voice; inflammation of the large bronchi is very rare, once only we have satisfied ourselves of its existence, we therefore rest assured that if there is a bronchitis existent with the pneumonia of children, it is always capillary.

Vesicular Emphysema.

To complete the series of the alterations, which we have met complicating pneumonia, we must mention vesicular emphysema, which we have sometimes observed.

It presented, usually, the following appearances. Occupying especially the summit and the anterior border of the lung, the emphysematous portions did not collapse upon the admission of air into the chest; they appeared of more than the ordinary thickness of these parts, and extended towards, or even covered the corresponding portions of, the opposite lung.

The lobules of the lung were protuberant, and the pulmonary vesicles, more distinct than elsewhere, were unequally though

slightly dilated, being never seen larger than the head of a large pin. We have never met with the appendices described by M. Louis. The emphysematous portions felt between the fingers did not appear thicker than the healthy tissue. The vesicles were perfectly transparent, and collapsed entirely upon puncture.

This alteration has appeared due, in some cases, to a rachitism of the chest, causing such a deformation as to compress the lung in certain parts. We shall develope this idea in another work, of which we have in part the materials.

Pleura.

Authors have said that pleurisy is rare in the child; if by this they mean, that pleurisy does not complicate pneumonia so generally as in the adult, they are right; but they are mistaken if they imagine pleurisy to be in itself a rare disease in children; since it is very common to find in the pleura of this age traces of recent or old inflammations. Thus, in forty-three cases, we have found the pleuræ healthy only ten times. Nineteen times we have met ancient adhesions more or less extensive, situated especially along the posterior border of the lung. Sixteen[1] times we have found recent adhesions not differing essentially from those in adults. Thus we have met with redness, and vivid injection of the pleura, with yellowish, soft, elastic, and at times tuberculous false membranes, with gelatiniform adhesions infiltrated with serosity, or with lemon coloured, clear, or flocculent serous effusions, and finally even with effusions of a purulent nature.

Acute pleurisy has been thought especially rare in children from two to five years, (Gerhard and Rufz): but we have observed it in a third of the cases at that age. It appears more frequent in females than males, and has always coexisted with a lobar pneumonia, or with the lobular form become general.

Bronchial Glands.

Often healthy, in other cases however, they were increased in volume, softened, reddened, or of a paler hue. Sometimes they had undergone tubercular degeneration, but in these the existence of tubercles was almost constant in the lungs: and even in one case, where one lung only contained tubercles, the glands of that side were alone affected.

As to alterations existent in the organs of other functions, their description does not form a part of our subject, it will be sufficient to indicate them, that their complication may be appreciated.

[1] These numbers form a total of forty-five instead of forty-three, two of the observations being doubled, from presenting recent, together with old, adhesions.

Pericardium.

Healthy in all our patients, containing from one half to three spoonfuls of a lemon coloured serosity; one subject, who had succumbed to hemorrhagic measles, presented ecchymosis under the fold of this membrane investing the heart; and another presented an ecchymosis under the serous membrane lining the fibrous investment of that organ, the consequence of pressure from a rachitic deformation of the chest.

Heart.

Always found in a normal state, both in volume and structure. It contained often coagula, either black or fibrinous; colourless in the auricles, and sometimes in the right ventricle. In the case of hemorrhagic measles, there were no where any coagula.

The lining membrane was always smooth, polished, and pale. The valves, especially of the left side, presented, rather often, a somewhat vivid redness, being thus tinged in one quarter of the cases, sometimes on the right, sometimes on the left, and at other times on both sides indiscriminately.

Brain.

Most generally the nervous system was healthy, with the exception of a subarachnoid infiltration, somewhat abundant, but neither more so, nor more frequent than in the other diseases of children.

Once there was a general hardening of the substance of the brain and spinal marrow; but there had been an existence of paraplegia, and the child showed some symptoms of asphyxia.

Digestive tube.—Stomach.

Seldom but slightly affected; this viscus has presented the following alterations:—

Ten times softening of the mucous membrane of the grand curvature: ought this to be regarded as cadaveric?

Redness, in different degrees, without softening or thickening, to be regarded as a slight congestion, but not inflammation, five times.

Once we found thickening, without injection; once ecchymosis; once linear redness along the grand curvature, with softening and superficial erosions: and, finally, in one case, after the injection of a large quantity of Kermes mineral, we found vivid redness in the small curvature, existing in large bands, small lines, or little points, with ecchymosis, the softening having attacked indifferently the red and the pale portions.

Small Intestine.

The lesions we have met in this organ are the following:—some

arborescent vessels or congestions more vivid than in the healthy state; thrice a white softening of the mucous membrane in a considerable extent; nine times redness and softening in the patches of Peyer; once only any ulceration of these patches. Every one is aware that the glands of Brunner appear in children generally very protuberant under the mucous membrane, dotted, or reticulated with black, without any actual morbid affection. We have, however, found them sometimes so red, soft, and swollen, as no longer to be regarded in the normal state.

Large Intestine.

It is here that we find the most frequent complications of pneumonia. But we must remark, that inflammations of this organ, together with those of the lungs, are, perhaps, the diseases most fatal to childhood.

The alterations may be classed as follows:—

1. Colitis, with redness, thickening, and softening.
2. Abnormal dilatation of the follicular orifices.
3. Colitis, advanced to ulceration, with or without false membrane. These ulcerations have always appeared seated in the follicles, more numerous at the end of the intestine, and never in the cæcum.
4. Softening, without notable change of colour, and with a normal thickness.
5. The easy separation of the mucous membrane from the subjacent tissue, with or without redness.
6. Ecchymosis.

To give, in a few words, our conclusions, the digestive tube has been the organ most frequently complicating by its affections the pneumonia—hardly can we count nine cases where it was throughout healthy. The greater part of these affections, especially of the large intestine, was chronic, consequently antecedent to the pneumonia; in proof of this, we have the fact that, in the great majority, the pneumonia developed itself in patients labouring under some anterior malady. The other abdominal organs were either healthy, or their slight alterations hardly deserve attention:—we may merely remark, however, that in the case of hemorrhagic measles, the kidneys presented numerous ecchymoses, with thickening of the mucous membrane of their pelves.

CHAPTER III.

MODIFICATIONS OF THE RESPIRATORY SOUND.

The discovery of auscultation, so eminently useful in the thoracic affections of adults, ought to render double service in the study of these maladies in a younger age. In reality, during the first years of life, the lung most often only betrays its diseases by those signs which the physical examination reveals: deprived of this precious aid to our investigation, we should be exposed every day to mistake, or to overlook the greater part of the diseases of the viscera contained in the cavity of the chest: therefore ought we to pay a particular attention to the numerous modifications of the respiratory murmur in this class of patients.

This subject has not yet received all the care it deserves: the character of the râles, their seat and frequency, the changes of one into another, and, above all, their respective diagnostic values, have not yet been pointed out in a sufficiently clear and positive manner. Let us see what the analysis of our facts furnishes upon this subject, in examining successively the sonorous, sibilant, mucous, subcrepitous, and crepitous râles, the bronchial respiration, and the natural respiration, when rude or obscure.

The sonorous and sibilant râles.—Their characters are the same as in the adult, and they are, without doubt, the least important of all—their duration is usually very short, (two days at the most:) they affect indifferently all parts of the chest, but never involve it in its whole extent. We find them at different epochs, but in a third of the cases (especially in the young subjects) before a full declaration of the malady. They precede, therefore, the appearance of the bronchial respiration, but seldom immediately, for usually we hear other râles before this latter manifests itself: in the large number of cases they are intermingled with the mucous crackles, and the sounds which replace them are very variable. They present hardly any diagnostic value, except in patients from two to five years, where the pneumonia usually commences with a bronchitis, and where the sibilant râle is often the first symptom of this latter affection. We deduce from this the practical consequence that, in a child of two years, a sonorous or sibilant râle should put the physician upon his guard against the ulterior development of a pneumonia.

As to the producing cause, the inconstancy and short duration of these râles have never allowed its discovery: we can, however, say, that in no case where they have been present, have we been able to discover, at the autopsy, in the corresponding part of the lung, any tumefaction of the mucous membrane of the smaller bronchi.

The mucous râle.—This râle resembles that in the adult, and does not present any varieties from age. Its bubbles, sometimes large, under the form of a crackle, sometimes finer, approach, in this latter case, the subcrepitous, with which it is easily confounded.

The mucous râle is heard usually both in inspiration and expiration, in all parts of the chest, always behind, generally on both sides, and sometimes in front. It presents itself at all the various periods, at the commencement, a few days after, or at any point in the course of the pneumonia.

We have remarked nothing constant in the alterations of the respiratory murmur preceding or succeeding it: we have seen it, however, succeed to a pure respiration rather oftener than to any other species. Its duration has, in general, been very short. This latter remark is especially true in children from two to five years, for in those from five to ten its progress, sometimes irregular, has been more constantly uniform, and its duration longer: it has existed throughout the whole of the disease, and when once its presence has been established, it was rare that we did not find it many days in succession in the same place, more or less extended. Seven times in thirty it was mingled with a bronchial respiration, especially in children from two to five years: once even it manifested itself at evening in a point where, on the morrow, we found a bronchial respiration.

From what we have said, the value of this râle appears superior to that of either of the other two: its great frequency, its persistence in certain cases, and its frequent coexisting with, or preceding a tubal respiration, render it a most precious means of diagnosis. It may, therefore, sometimes be regarded as the generating râle of bronchial respiration, (only, however, in cases from two to five years.) What a difference from the mucous râle of adults, which is only indicative of a simple catarrh!

The subcrepitous râle.—What we have said of the last râle will apply, in part, to the subcrepitous, since, in a large number of cases, the passage of one to the other is very difficult to seize. Generally, it was heard in both the times of the respiration; sometimes only in the inspiration, especially when accompanying the bronchial sound: *once* only it existed in the expiration alone. Our remarks upon this râle refer especially to children from two to ten years, for from ten to fifteen we have observed it but five times. It existed oftener on both sides than on one alone: in three quarters of the cases to a greater extent at the base than elsewhere, but we have heard it in all parts of the chest. When existent only on one side, it was often mingled with a bronchial respiration: in the young subjects, from two to five years, in half the cases where heard, it appeared in points where the bronchial respiration afterwards developed itself; so that it may be regarded as one of its generating râles. Observe, to strengthen this remark, that it was precisely in those cases where we had auscultated the patients from

the beginning, that this succession of symptoms was observed; which would encourage the idea that its absence, in the other cases, was due to our not having auscultated sufficiently early, rather than to its non-existence.

The duration of this râle was variable—short, three or four days at the most, when manifesting itself before the bronchial respiration—much longer when it succeeded it. In a child of three years, under these circumstances, it persisted for two whole months.

Existing sometimes alone, it was more frequently accompanied by a bronchial inspiration or expiration: in some cases it was heard around the tubal sound, and, as this latter advanced, the râle preceded it to attack the adjacent parts.

In cases where it disappeared, it was replaced by different alterations of the respiratory sound presenting nothing constant.

This râle is of great value in the diagnosis. The fact that it so often precedes the bronchial respiration, and is heard where the other is soon to appear, establishes, it would seem, a very important relation of cause to effect. The shortness of its duration, when anterior to the tubal sound, is explained by the rapidity with which the hepatisation supervenes: while its length, when succeeding to this latter, confirms the remark already made, of the tardy resolution of pneumonia in younger children. We can then establish the principle, that, when in a child of from two to five years, presenting for some days some slight modifications of the respiratory murmur, the sonorous or sibilant râles, for example, we begin to detect a subcrepitous râle with equal and numerous bubbles, there is strong reason to suspect the immediate invasion of a pneumonia.

Crepitous râle.—This rale, pathognomonic of the pneumonia of adults, does it exist in children? Gerhard and Rufz say never in children from two to five years: this appears to us erroneous, for we have observed it in nine of our patients: and we are quite sure never to have mistaken for it a subcrepitous râle, as we find it clearly mentioned in our notes as a *crepitous râle, excessively fine, as in the adult.* With the exception of three cases, it has always been mingled with bronchial respiration: once it appeared on both sides behind, and was replaced the next day by a subcrepitous râle: another time it occupied the whole of the right back. In this case, the child succumbing twelve hours after, we found the lower lobe of a violet colour externally, of a deep red on incision, impenetrable to the finger, still swimming upon the surface of water, and, when pressed, giving issue to a great quantity of blood, with a little air. This description corresponds entirely with the inflammatory engorgement of Laennec, and, consequently, the lung, in this case, was in progress towards hepatisation, the rapidity of the fatal termination alone preventing its arrival there.

In older children, the crepitous râle is admitted by all pathologists. We have met it eleven times, always intermingled with a bronchial respiration. Its shortness of duration is quite remark-

able, one or two days at most, never reappearing in the points where it primitively showed itself.

The value of this râle is very great, as being a predecessor of bronchial respiration; nevertheless, as compared with the subcrepitous, its importance is diminished by its rarity.

In closing the history of these râles, we would call the reader's attention to their duration being shorter, their march less regular, and their transformations more numerous in the child than in the adult. Our observation confirms, also, the remark of M. Guernard, with regard to the facility with which we cause their disappearance, by keeping our little patients a short time seated, and their greatest distinctness at the moment when the child is raised from his bed.

Bronchial Respiration.

Of all the alterations of the respiratory murmur, this deserves the most particular attention: it was present in two thirds of our cases, and where it is not in our notes, the lesion was either very limited, or auscultation had not been practised during the latter days of life. A remarkable fact, often established by our cases, is, that frequently this modification of the respiration was only heard in the expiration, while the inspiration continued pure, or accompanied by some râle. In these cases, the expiration, prolonged and bronchial, manifested its peculiar note in the little accompanying cry. We have observed this phenomenon more generally in the younger subjects, and at two particular stages of the disease, viz.: either before or after the appearance of the bronchial respiration, when the disease was beginning to limit itself.

But why is it that the bronchial respiration was thus more frequently heard in expiration?

In children from two to five years, lobular pneumonias, of one kind or the other, being, without contradiction, the most frequent form of the disease, it is natural to suppose that this stethoscopic phenomenon originates in this peculiarity. The little nodules, with regard to their influence upon the respiratory sound, have the same effect as tubercles. Now, since Jackson,[1] we all know a prolonged expiration to be a sign of tubercles scattered in the pulmonary parenchyma. In children from two to five years, as we have already said, the bronchial respiration was, in a certain number of cases, preceded by râles of different natures. In the subjects more advanced, it was often ushered in by an obscurity of the respiratory sound, and in this class, more frequently than in the other, it was the first symptom established.

In children from two to five years, it has always existed posteriorly, and most commonly near the vertebral column.

In those from five to fifteen, we have, in the great majority of

[1] The late James Jackson, jr., of Boston.—*P.*

our cases, found it behind: four times only anteriorly, of these once at the level of the right middle lobe, once at the anterior and middle part of the two lungs, and, finally, in the two other cases under the clavicles. In the greater part of our patients, we have found it for several successive days.

In children from two to five years, in cases terminating favourably, the bronchial respiration disappearing, gave place to divers modifications of the respiratory sound. In those cases, on the contrary, where death supervened, it persisted until that event, and this persistence, when it coexisted with an increase of the general symptoms, was considered by us of very grave import; whereas in a child of nine years, in whom the disease was developed in a state of perfect health, the bronchial respiration was heard several days after the disappearance of the febrile symptoms, and when, to all external appearances, the disease no longer existed.

Although generally easy to hear, we ought to remark, that the presence of râles, the difficulty of inducing our little patients to cough, added to their repugnance to examination, sometimes mask its character. But without regard to the difficulty of its perception, can bronchial respiration in children possibly be confounded with any other stethoscopic sign? We have no doubt of it. In a good number of cases, we have seen persons little accustomed to auscultation, especially of the healthy lung of children, mistake the normal puerile respiration for the bronchial; nevertheless, the difference is great, for however puerile it may be, it always gives the sensation of air entering a number of vesicles; besides, it is only heard in the inspiration, whereas the bronchial character especially manifests itself in the expiration.

There is, however, a variety of respiration still more difficult to distinguish from the bronchial, viz. a rude respiration; and we even incline to think that this rudeness is, in some cases, the index of a pathological condition differing only in extent from that giving rise to the tubal sound; we have observed it only a small number of times. More than this it has offered nothing constant, either in its duration or in the râles preceding or succeeding it.

A bronchophony has always accompanied the bronchial respiration, whenever we have succeeded in eliciting a few words from our little patients; in some cases, the resonance of their plaintive cry has replaced with advantage the bronchophony which we could not establish.

The respiration is sometimes quite obscure: this character precedes immediately the bronchial respiration, or else shows itself at different epochs of the disease. The duration of this state was generally very short.

To conclude;—of all the signs which auscultation gives us, the bronchial respiration is the most precious aid; it is the only pathognomonic symptom of inflammation of the pulmonary parenchyma, indicating by its extent that of the disease, and by its persistence the gravity of our prognosis.

Percussion.

As a diagnostic sign, percussion is of much less value than auscultation; it furnishes no results in the simple lobular form of the disease; it is only useful where the hepatisation is become general, or from the commencement has taken the lobar form. We find dulness on percussion signalised in many of our cases, always in proportion, both in extent and degree, to the bronchial respiration, generally developed at the same time with, never, however, before it.

Percussion, to be useful, should be practised with much care, and the observer should be perfectly acquainted with the natural resonance of the child's chest. The thorax of the young subject being naturally very sonorous, the flatness is seldom any thing more than relative. The comparative sonorousness, also, of the different parts of the chest is not to be overlooked; thus, the inferior dorsal region being naturally the most resonant, percussion has never given but a relative degree of dulness.

There are even cases of greater difficulty, as where a double hepatisation has gained the same level on the two sides, and where in consequence we have no longer any point of comparison. M. Hourmann, who allows but little value to percussion, insists somewhat upon important results obtained from the application of the palm of the hand upon the chest. He thinks that the vibration of the walls of the chest, from the cries of the child, always communicates to the hand upon the diseased side a more decided vibratory thrill.

CHAPTER IV.

THE CONNECTION BETWEEN THE AUSCULTATION AND PATHOLOGICAL ANATOMY.

After the separate study of the alterations of the respiratory murmur, and the pathological anatomy in this disease, we come naturally to the question of the correspondence between the two.

To establish a comparison of this nature, we shall follow the same steps as in the description of the pathological anatomy, and as in the series of pathological changes we have found a chain commencing with the capillary bronchitis and ending with the lobar pneumonia; so, also, we are able to establish a gradation of symptoms admitting of a perfect parallel. There is the same difference between the stethoscopic signs of the capillary bronchitis at one end of the chain and those of the lobar pneumonia at the other, as there is between the pathological states of the lung in these

cases: and as the intermediate lesions are but the union of the two extremes in different proportions, so their symptoms are a proportionate combination of those furnished by the same extremes.

To illustrate our remark, a bronchitis reveals itself by a mucous or subcrepitous râle; a pneumonia, by a bronchial inspiration or expiration; and the predominance of either of these in a combination of the two, is the index of the like predominance of either of the affections—inflammation of the mucous membrane or of the parenchymatous structure of the lung.

For these reasons, and to facilitate our discussions, we give a name to each of these extremes. Thus we shall speak of the capillary bronchitis, the bronchial mucus, and the mucous and subcrepitous râles as the bronchial element, whilst the inflammation of the parenchyma, with the bronchial respiration, will be the parenchymatous element, the predominance of either making the excess of its element in the particular affection of the lung.

This understood, it remains to us to complete the parallel, in properly estimating and specifying the degree of combination of the two. In this we shall support ourselves wholly by our observations, and although, with our point of departure, we might make a diagnosis from theory alone, we shall avail ourselves of this latter only to facilitate and illustrate our facts.

We shall first call the attention to the different varieties of pneumonia uncombined, examining afterwards their symptoms when united with, or complicating some other of the alterations which we have described.

Vesicular Bronchitis or Pneumonia.

This affection has always occurred to us in connection with some other form of pneumonia, or at least a capillary bronchitis; but it is easily conceivable that the bronchial element is here the only existent one, both as symptom and pathological state.

Lobular Pneumonia.

It is impossible to study the characters of this inflammation in its state of perfect simplicity, as it is never met with without a coexistent bronchitis, or at least an abundant secretion of mucus; thus, instead of finding a pure hepatisation, we have a combination of our two elements.

But what a variety of circumstances influence the predominance of one or the other? We have, for example, some scattered points of pneumonia, with an abundant effusion of mucus; here is predominance of the bronchial element. On the other hand, a case presents a slight quantity of mucus, with but thickly disseminated points of pneumonia; here the parenchymatous is the most declared: the same difference, if the little nodules be superficial or central, voluminous or small in size.

Hence the great irregularity of the simple lobular pneumonia, which has not yet become general.

It is always to be kept in mind, however, that the bronchial element is much more universal than the other, and, as it were, surrounding it, it is the more easily detected by the ear. Thus, in all cases, where the autopsy has shown a lobular pneumonia of the whole or part of the lung, we had during life observed in the corresponding mucous or subcrepitous râles, remarkable for their persistence, having endured from the commencement of the disease until death. In these cases the percussion has furnished us no light, for the resonance was nearly always equal to that of the opposite side.

In a small number of our observations we have met with superficial points of pneumonia in those parts of the lung where auscultation had detected a drier and finer râle, surrounded by the moist râle of a bronchitis, and this we have regarded as the commencing development of the parenchymatous element.

At other times we have heard a prolonged expiration or a very rude inspiration always accompanied by a râle more or less fine, and always at points where the autopsy revealed an assemblage of a somewhat large number of the little nodules of pneumonia: in these cases, in fact, we consider the lobular pneumonia to play the part of tubercles in producing the phenomena of the auscultation.

We have also heard the bronchial sound in the expiration, and even both in expiration and inspiration, in cases where the mucous râle became less abundant; and these symptoms have disappeared upon the bronchi becoming again filled with fluid.

This occurred in points where the autopsy afterwards demonstrated a lobular pneumonia.

Finally, we are to observe that all the symptoms of the parenchymatous inflammation are more easily appreciated at the summit or middle, than at the base of the lung; it is there that we have been most sure of our diagnosis, because there the subcrepitous râle is less abundant, and at times even absent entirely. From these remarks we may deduce.

1. Lobular pneumonia is more easy of detection superiorly than inferiorly, but as it does not affect any particular part of the lung, when we find it in one portion we may suppose it to exist elsewhere, and the manifestation of the slightest symptom of the parenchymatous element authorises us to admit its more general extension, especially if the bronchial element be very well declared, and the natural symptoms lead us to suspect a pneumonia.

2. A single examination does not suffice for a positive diagnosis, but it should be repeated often in the same day, to seize, if there be any, the changes from the one element to the other.

3. Not being able to augment the parenchymatous element, we should seek to diminish the bronchial. Thus, in all cases it is useful to free the child's chest of any mucosities, and in this we shall have the additional advantage of assisting our diagnosis.

With these precautions, our stethoscopic diagnosis will be certain, if not in all, at least in the greater number of cases; and if we will avail ourselves of the other signs to be hereafter detailed, we shall seldom be found at fault.

Simple Lobular Pneumonia becoming general.

In these cases the two elements, the bronchial and the parenchymatous, are equal, and manifested nearly at the same time, whatever may be the amount of either.

It is easily conceivable that the pneumonia must have become already general in a certain extent, for these two symptoms to be constant.

Thus, a bronchial respiration or expiration, with a mucous or subcrepitous râle and dull on percussion, are the peculiar symptoms of this affection; we have, however, seen one case where the bronchial respiration was not heard till the evening before death, although the pneumonia had become general, and advanced even to the third stage in some places. In this case, the mucous râle was extremely full and abundant, and the bronchial tubes were crowded with mucus.

When we can follow the march of a lobular pneumonia in progress towards the lobar form, we find first the râles, then an expiration, or a bronchial respiration, unequally disseminated and extending little by little till it involves a considerable space.

And to show that this is not merely in the imagination we will transcribe a portion of one of our observations.

1st day.—Right back, subcrepitous râle rather rare in both times of the respiration; at the left summit a little sonorous râle.

2d day.—Abundant subcrepitous râle on both backs.

3d day.—Behind, at the left base, and at the middle of the right lung, bronchial expiration, mingled with a somewhat coarse subcrepitous râle, heard above and below the point of the bronchial respiration.

4th day.—In the whole height of the right back, bronchial expiration, with a little subcrepitous râle at the base; *on the left the bronchial respiration is scattered here and there.*

5th day.—Respiration fully declared as bronchial in the two upper thirds of both backs; below, fine subcrepitous râle.

At the autopsy there was found a pneumonia originally lobular, but already become general.

It remains now to decide if auscultation can teach us the time necessary for a lobular pneumonia to become general. Our observations offer us little assistance upon this subject; nevertheless, considering the rapidity with which the bronchial respiration declared itself after the catarrhal period in the case just detailed, we may conclude, that its march, once commenced, is very rapid. We shall see hereafter, however, that the rapidity of this progress is

subordinate to the nature of the disease upon which the pneumonia supervenes.

Lobar Pneumonia.

The crepitous or subcrepitous râles, bronchial respiration, bronchophony, and dulness upon percussion are the characters of this pneumonia as well in the child as in the adult.

In the younger children, however, the bronchial element always exists: thus in those cases, the râle is more moist than in older subjects, where the parenchymatous element, on the contrary, predominates in the auscultation as at the autopsy.

It is only in the lobar pneumonia that we have a difference thus made by the age of the patient; in the lobular form we have been able to establish no such distinction.

Carnification.

This affection is generally of too little extent to give rise to any well marked symptom. Most generally we have only noticed a mucous or subcrepitous râle, with a slight diminution of the resonance upon percussion; and a careful examination of all our observations leaves us with the general idea that in an equal extent of lesion, carnification offers much less an amount of stethoscopic signs than hepatisation. Twice, however, in a vast carnification, we found, in ausculting at various intervals, the bronchial respiration.

Thus far we have the history of the simple cases. But a complication of the pneumonia with any other disease of the lung must cause many modifications in their signs. These complications are of two kinds: either several species of simple pneumonia are united in the same point, or else there is joined to it some one of those lesions, of which we have not yet detailed the symptoms.

The first division will detain us but a few moments; its signs must depend upon the mixture, more or less considerable, of the two elements; we have seen cases of the union of both species of bronchitis, the capillary and the vesicular, of this latter or perhaps of both with a lobar pneumonia or carnification. In the first case the bronchial element existed alone; in the second the parenchymatous predominated. We would be understood, however, to allow that auscultation does not furnish a differential diagnosis between these simple and the complicated affections.

The second class comprehends those cases where a dilatation of the bronchi, or an emphysema occurs in conjunction with the pneumonia.

A priori we should be unable to say what might be the influence of the dilatation of the bronchi upon the auscultation: for if on the one hand it would produce bronchial respiration by the increased size of the tubes, on the other it must facilitate the mucus

râle, rendered more abundant and more moist by the quantity of fluid, and the greater space allowed to the formation of the bubbles.

Facts show us that both these circumstances may occur; we have observations of dilatation of the bronchi in which the bronchial element predominates, while in others it is the parenchymatous.

But in this latter case we would suggest the question whether the mucus was or was not charged with air, for this appears to coincide with a remarkable change in the production of the râles. We judge so by two cases, in both of which the parenchymatous element predominated in the auscultation, whilst at the autopsy the bronchial appeared the more abundant: one was a case of vesicular bronchitis, with a lobar pneumonia, and a very abundant quantity of mucus; the other a lobular pneumonia become general in the first and second degree with a dilatation of the bronchi, and also a large secretion of mucus. In the first case, we had a bronchial respiration with very little subcrepitous râle in the same points: in the second we had a pure crepitous râle: but in both these observations, the mucus was not charged with air, or rather we found a puriform liquid, which seemed never to have been penetrated by the air, and therefore not to have contributed to the stethoscopic sound of bursting bubbles. Thus in these cases the sounds emanated from the parenchyma of the lung.

To conclude, we find only one case of vesicular emphysem complicating the pneumonia; this case, one of the most complicated of all, was a capillary and vesicular bronchitis, with lobular pneumonia at the third stage, dilatation of the smaller bronchi, and emphysema, showing the bronchial element in excess as pathological alteration and consequently as symptom. Besides the fundamental symptoms, we are to regard also a third—the intensity of the respiratory sound. In one case, this, in consequence of the emphysema, was nearly nothing, while the resonance on percussion was exaggerated. In addition, we had presented to us another phenomenon which, according to Laennec, may be referred to the emphysema as cause: thus, at any moment of the disappearance of the mucous râle, we heard a succession of dry crackles, a sort of gross crepitous râle. These crackles could not be attributed to the lobular pneumonia, as they were too large and heard in an extent too considerable.

In this case the emphysema was the phenomenon clearest characterised, and its symptoms were the following:

Mucous râle disappearing after cough, leaving the respiration very obscure, with a return of the râle, alternating with the dry crackling. Resonance on percussion much exaggerated.

In conclusion, the following may be regarded as the stethoscopic signs of each of the alterations which we have described:

Capillary and vesicular bronchitis:—mucous or subcrepitous râles; natural resonance upon percussion; lobular pneumonia; mucous or subcrepitous râles, mingled at times with a râle more

dry in its character; a roughness of the respiration; prolonged or bronchial expiration; resonance natural.

This latter species become general:—mucous or subcrepitous râle, with bronchial respiration scattered or rapidly spreading; dulness.

Lobar pneumonia; crepitous or subcrepitous râles, bronchial respiration, bronchophony, dulness.

If a dilatation of the bronchi be joined to one or the other of these affections, it is sometimes the mucous or subcrepitous râle, sometimes the bronchial respiration which are exaggerated.

In all that precedes we have as yet said nothing of the stethoscopic signs marking the change of the pneumonia from the first to the second or from the second to the third degree. We have however spoken of one case where a well manifested pulmonary engorgement gave for symptom a pure crepitous râle. As for the distinction between the second and third degree, it would appear impossible to establish it, and for this very simple reason, that in all our cases of gray hepatisation, there existed no considerable softening of the parenchyma. Now Laennec asserts that the infiltration of pus into the pulmonary parenchyma affords us no new sign, as long as it remains in a concrete state. But even supposing the pus to have softened, the mucous râle, which, according to this author, indicates the change, would be of no use to us, considering its excessive frequency in children.

CHAPTER V.

CAUSES.

After the study of the anatomical lesions in the pneumonia of children, and the exposition of the physical symptoms which correspond to them, we come naturally to the question of the circumstances favouring the development of the disease under consideration.

A fact, which strikes at first view, and which has been noted by all authors, is, that in the large majority the pneumonia supervenes in the course of some prior affection. This has been especially insisted upon in children of from two to five years. Gerhard and Rufz go even so far as to say that idiopathic pneumonia does not exist at that age. This assertion we cannot admit in all its rigour, since we possess three examples of children of five years, in whom the disease was developed in the midst of perfect health: but we recognise the truth of the general proposition; of forty patients between these ages, only three were in full health at the commencement of the pneumonia.

But more, it is not solely in these first years of life that the dis-

ease is rare in an idiopathic form: it is the same in the succeeding periods. Our observations prove this very evidently. Of twenty patients from six to fifteen years, six only were in good health at the invasion of the malady, the others were attacked with different diseases: measles, small-pox, typhoid fever, hooping-cough, gangrene of the mouth, &c.

From these remarks it results that children may be attacked with two kinds of pneumonia; one somewhat rare which may be styled the idiopathic, or the primitive, the other much more frequent, which we shall call the complicated or secondary form.

This fact once admitted, what are the causes exerting an influence upon the development of this inflammation.

Age is one of the most efficient of the predisposing causes, since from two to five years the malady is by far the most frequent. In sixty patients, forty were from two to five years of age, and twenty between five and fifteen: and the real proportion is even greater than this, as the number of beds in the ward for the older children is much the more numerous, and the admissions there consequently more frequent.

To corroborate our assertion we will cite the result of the tables of pathological anatomy drawn up by M. Haese, who in one hundred and eight autopsies found a pneumonia seventy-one times in children between two and five years, and thirty-seven times only between the ages of six and fifteen.

Age exerts an influence not merely upon the frequency of the disease, but equally upon its particular form. We are of opinion, however, that the proposition, that lobular pneumonia is peculiar to the younger class of children, is too general—for although without any doubt it is more frequent at these ages,[1] still we possess an observation of a perfectly well marked lobular pneumonia in the partial form, in a child of nine years. And, in an examination of facts furnished by our predecessors, we find, that the first case of M. Burnet, is this form of the disease succeeding to measles, in a girl aged eight years; and his fifth is of the same affection in a child of nine and a half years: and lastly M. de la Berge's first observation is in the same category.

Another fact, tending to limit the influence of early age upon the particular form of the disease, is, that from the observations of MM. Valleix and Vernois, the lobular form is very rare in infants.

Sex has not appeared to us to exercise any well marked influence upon the development of the pneumonia in the first class of our patients; neither has it in the second series, when the disease complicates some pre-existing affection: but according to Gerhard, idiopathic pneumonia from the ages of five to sixteen is more common in males than females.

Authors vary upon the time of the year most favourable to the production of pulmonary inflammations. M. de la Berge, reason-

[1] See table of Pathological Anatomy.

ing from the fact of the great number of eruptive fevers in spring and autumn, advances an opinion that lobular pneumonia is more frequent at these seasons. M. Leger makes the same observation; and Dr. Gerhard assures us that idiopathic pneumonia is the most common in the months of April and May.

One of our colleagues, M. Becquerel, having had the kindness to place at our disposition a list of the pneumonias occurring in the service of acute diseases, (girls,) during the months of April, May, and June, we are enabled, in uniting his notes with ours, collected at the beginning and end of the year, to give a complete table of all the pneumonias observed in this service during the year 1837. We would observe, however, that circumstances beyond our control having prevented the observation of a few cases, which occurred in the latter end of March, this month will not enter into our table of results. The total of pneumonias in the eleven months is ninety-four, divided as follows:

(We have marked not only the number of the pneumonias, but also the relative frequency of the idiopathic and complicated.)

Months.	Number.	Idiopathic.	Complicated.
January,	8	1	7
February,	18	5	13
March,			
April,	8	1	7
May,	5	1	4
June,	7	1	6
July,	13	0	13
August,	5	0	5
September,	5	1	4
October,	9	1	8
November,	11	2	9
December,	5	0	5
Total,	94	13	81

Different consequences may be deduced from the foregoing tables. 1. What we already knew;—the enormous disproportion between the frequency of the idiopathic and complicated pneumonia; 2. the rarity of idiopathic pneumonia in the warmer months of the year. We may moreover observe, that the number of complicated pneumonias depends upon the prevalence, at the time, of those diseases, upon which they are liable to supervene. Thus if the month of February presents the largest number, we find the cause in the epidemic prevalence of the grippe at that season of this particular year, (1837.)

Taking into account the force of the constitution, we have made the remark that nearly all our younger class of patients presented a very delicate complexion, while those from six to fifteen years appeared generally to enjoy a very good constitution.

Different debilitating causes appear to exert a very manifest influence upon the pneumonia of children, we refer particularly to the diseases in the course of which the affection of the lungs supervenes, a prolonged residence at the hospital and the continued decubitus upon the back.

It will not be uninteresting, to examine what are the affections with which the pneumonia is most frequently complicated, as well as the comparative frequency of these diseases in the different ages —a glance at the following table will satisfy us upon these points :

From two to five years.

Diseases.	Number of cases.
Measles,	11
Hooping-cough,	3
Slight catarrh,	2
Small-pox,	2
Varioloid, or scarlet fever,	1
Chronic enteritis,	6
Gangrene of the mouth,	1
Rickets,	1
Hardening of the cellular tissue,	1
Paralysis of the arm,	1

From six to fifteen years.

Diseases.	Number of cases.
Measles,	4
Small-pox,	3
Hooping-cough,	1
Bronchitis and enteritis,	1
Typhoid fever,	2
Gangrene of the mouth,	2[1]

From this table it results, that from two to five years of age measles is the disease most frequently complicated by pneumonia, then chronic enteritis and hooping-cough ; whilst after five years it is measles, with small-pox second in frequency. Although in our result gangrene of the mouth only appears three times, we can assure the reader, that, of all the diseases of children, it is the most frequently complicated by pneumonia ; for we have seen this inflammation in eleven cases of gangrene of the mouth ; and M. Baudelocque's experience is perfectly in accordance with our own.

Independently of the diseases just mentioned, predisposing more or less decidedly to pneumonia, we would observe that the cuta-

[1] The tuberculous affection, as predisposing cause, does not appear in these tables, as we have eliminated all the cases of pneumonia supervening in advanced phthisis.

neous system presented different affections (ecchymosis, eczemas, &c.) in one half of our cases.

The prolonged sojourn at the hospital, and especially the decubitus upon the back, have been very justly considered by M. Leger, as prejudicial to young children; an assertion confirmed by our own cases, for we possess observations in which the sole cause, which could be considered as productive of the disease, was the long decubitus upon the back.

The explanation of this is easy. The weakness and the difficulty of the expectoration in children, favours, in certain cases, the stasis of the liquids in the most inferior portions of the lung, where their sojourn determines an inflammation of the neighbouring parts,—we say *determines the inflammation*, because, in the great number of cases the anatomical changes have not appeared to us as analogous to those of the hypostatic pneumonia, and we would not give a purely mechanical explanation either of the lobular or lobar hepatisation. We advance here an opinion directly opposed to that of Dr. Gerhard, who thinks that pneumonia in children from two to five years of age possesses a very great analogy with those sanguineous congestions resulting from a mechanical obstacle to the free circulation of the blood in the lungs. It seems to us, that to refuse to the pneumonia of young children any purely inflammatory character, is to put ourselves in direct opposition to facts. A rapid progress, formidable symptoms of reaction, evident traces of an inflammation in the lung or its dependances—are not these sufficient to characterise an inflammatory affection?

Authors have not contented themselves with the simple causes above enumerated, but have wished to ascend higher, and seek in the peculiar structure of the child's lung, the rapidity of the circulation, the number of inspiratory movements, &c., an explanation of the frequency of pneumonia at this age. So far these pretended causes are to be considered merely as flights of fancy, more or less ingenious, not as settled and positive facts.

Latterly MM. Burnet and De la Berge have sought to connect pneumonia with a cause more general than any we have mentioned. They have advanced that the lobular pneumonia always succeeds to an inflammation of the bronchial tubes. This is a question of sufficient importance to receive a special and attentive examination.

If our details, when upon the subject of the pathological anatomy, be recalled, it will be seen that in many cases the most attentive examination of the smaller bronchi did not enable us to assure ourselves of the existence of an inflammatory lesion of these tubes. Pathological anatomy thus affording no light, we are obliged to have recourse, for a solution, to a careful examination of the symptoms. And what do these teach us? That in the great majority of cases, not only in the variety described by M. de la Berge, but also in the diffused lobular species, and even in the lobar form in the youngest children, there exist cough and different altera-

tions of the respiratory murmur, supposed to be dependent upon a bronchitis, before the positive signs of a parenchymatous inflammation have declared themselves.

Therefore, without denying the possibility of a pneumonia originally commencing in the parenchyma, in children from two to five years (for we possess examples of it) we regard the occurrence as exceedingly rare. But very frequently it is impossible to recognise any connection between the gravity or extent of the catarrh which precedes, and the pneumonia which follows; so that the bronchitis ought to be regarded as predisposing to inflammation of the parenchyma, rather than as an occasional active cause; and the phenomena to be those of a propagation of inflammation in continuous textures.

Thus, to sum up;—nearly all the causes of pneumonia in children are reduced to the predisposing; and if a change of temperature, a suppression of an habitual discharge, a repercussion of a cutaneous disease, or the exanthemas, are capable of its production, our observations enlighten us very little with regard to the degree of their influence. We have, however, thought ourselves to have observed that sudden changes of temperature had a manifest influence upon the development of this disease. Thus, in two cases, we have imagined that a sudden chill appeared to have been the occasional cause of the appearance of the pneumonia. In one of these a young girl, ill with measles, was seized with all the symptoms of a pneumonia (cough, pleuritic pain, &c.) after putting her feet upon the ground, the eruption being in full vigour; in another, a young boy, going out the eighth day of the eruption of small-pox, was taken four days after with cough, dyspnœa, and we discovered from the day of entrance all the signs of a pneumonia at the second degree. We have observed, in young children labouring under diseases of the skin or hairy scalp, the falling off of the scabs or the suppression of the discharge, far from being the cause, to be rather the result of the inflammation, and the affection of the skin to be sensibly modified after the full development of the pneumonia.

CHAPTER VI.

RATIONAL SYMPTOMS.

The pneumonia, once declared, determines in the organism an assemblage of symptoms which we must attempt to comprehend. It has been lately often repeated,[1] that children manifest in their

[1] The authors refer here to the ideas of M. Jadelot, one of the physicians at the Enfans Malades, upon the lines of the countenance as diagnostic of visceral disease.—*P.*

countenances, the signs of the diseases with which they are attacked; it has been admitted that certain modifications of the lines of the countenance correspond constantly with certain thoracic or abdominal affections: we have attempted, in the larger part of our cases, to appreciate the value of these diagnostic signs, and the following are our results:—

We have remarked nothing constant in the different folds of the skin of the countenance; they appeared to us rather as the index of a general suffering than as pathognomonic of disease of the viscera, either of the chest or abdomen. We will not say the same, however, of the dilatation of the alæ nasi, which we have observed in nearly all our cases, immediately preceding the inspiration, and lasting nearly the whole period of the disease. Sometimes it was excessive, and nearly always proportionate to the acuteness and gravity of the pneumonia. In young children the general expression of the countenance was very various—sometimes pale, sometimes coloured, at times only on a single cheek, but without any reference to the side affected by the pneumonia; it offered in several cases, from the commencement of the disease, a profound and characteristic alteration, followed by a rapid emaciation. But it would be wrong to consider this facial alteration as peculiar to the younger series, for we find it noted in several of our observations of children from six to fifteen years, in whom the termination of the disease proved fatal.

Paleness and puffiness of face are notes in many of our observations, coinciding often with infiltration of the extremities.

In young children, being unable to establish the existence of a chill, we cannot say if the disease commences in this manner; but we are certain that, after the invasion of the pneumonia, the heat of the skin was sensibly exalted in the larger part of our patients: most usually it was great, sometimes excessive, but almost never accompanied with moisture.

In older children the disease commences with a very appreciable chill, to which the heat of the skin soon succeeds.

The pulse was always counted—rarely under 120; in the younger children it varied between this number and 140 to 150, and has been observed as high as 180. In children from six to fifteen years it was less accelerated, as it more rarely attained 140 to 150, but the day of invasion it was always 120.

In the greater number of cases after the commencement it presented no special character: usually full and regular, but nearly always in the younger children, a few days before death, it became of an extreme smallness, sometimes nearly imperceptible. In the cases terminating favourably, this smallness of the pulse was never observed at any period of the disease.

The number of inspirations varied between thirty and eighty, in the children from two to five years; in those from six to fifteen, between twenty-four and sixty-eight. In the half of the cases they presented nothing particular; in the other half, at all ages, but

specially in the younger series, we observed the following peculiarities:—Sometimes they were anxious, very full, raising the whole chest, or else they were entirely abdominal; at other times they were irregular, unequal, and interrupted; in some cases the inspiration was normal, the expiration alone being hard, noisy, painful, difficult at the commencement, and seeming to exact an effort, and to be rather an active than a passive phenomenon.

A great number of our cases of pneumonia declaring themselves at the hospital, we have been able to establish the increase in the number of inspirations and pulsations at the moment of the declaration of the disease; we cannot too much insist upon the simultaneous appearance of these two symptoms. But we would be careful to say that it is only on the first, second, or third day that we are able to remark this, since later in the disease, under the influence of treatment, or causes which escape our observation, the comparative march of the pulse and respiration becomes often irregular, and even inverse: that is to say, we find an increase in the number of pulsations to correspond to a diminution of the number of inspirations, and *vice versa*.

After this separate examination of the pulse and respiration, let us see the influence of the extent of the hepatisation upon these two symptoms. When there was no complication of other acute disease, the acceleration of the pulse and respiration has been in direct proportion to the acuteness and extent of the inflammation, with the exception of some cases already alluded to, where the discrepancy was to be attributed in part to the treatment.

In the cases of pneumonia co-existing with an acute disease, the measles, for example, the acceleration of the pulse and respiration was sometimes extreme, although the inflammation of the lung was very limited.

We think, therefore, that we may say, in general the intensity of the febrile reaction depended upon the extent of the inflammation. This result, although a rigorous deduction from facts, so simple as to appear to be established *à priori*, is nevertheless opposed to what has been written by authors upon the lobular pneumonia; who state the pulse and respiration to be always much accelerated.

An examination, however, of these observations of MM. Burnet and de la Berge, shows us, that in all the instances of acceleration of the pulse and respiration, the fever explains itself very naturally by the existence of certain coexisting affections, measles, typhoid fever, &c. Independently of the extent of the hepatisation, the reaction depends on the nature of the disease upon which the pneumonia supervenes; we shall have occasion to revert hereafter to this latter consideration.

When an effusion into the cavity of the pleura complicated the pneumonia, we find mentioned in our notes a collection of symptoms, which in a similar case might serve for diagnosis. We refer to the *paroxysms of suffocation*. The oppression becomes extreme, the inspirations succeed each other with a prodigious rapidity, the face

is purpled, and these symptoms all disappear, to be in a short time reproduced. In ordinary pneumonia the difficulty of the respiration is sometimes very great; but in general its progress is more or less regular, whether in the increase or decline, and does not show itself thus under a paroxysmal form.

In cases where the respiration has been irregular or unequal, we have not observed these circumstances to be dependent upon any greater or less intensity of the inflammation; in two cases, one of a pneumonia of the whole posterior part of the lung, comprising also the whole superior lobe, and the other only of the summit, the respiration was in both remarkably unequal. And finally, in those where it is noted as anxious, raising the whole chest, the pneumonia was very extended, occupying even nearly the two entire lungs.

The cough has been wanting twice: another time it was excessively rare, (lobular pneumonia.) In regard to the great number of cases in which it existed, it ought to be ranked among the important symptoms: but its value as such is much affected, inasmuch as it often occurred before the other signs of pneumonia could be found to exist. In more than one half of the cases it is noted as rare; but in those where it was observed as frequent, it increased quite sensibly in proportion to the progress, and in direct ratio with the extent of the inflammation. It diminished, however, with the strength of the patients, and in the last days of life it was entirely wanting. Nearly always it was dry, and in eight cases it existed in paroxysms; but in five of these there was a complication of hooping-cough and very intense catarrh, and in another a pleuritic effusion. Once it was remarkably hoarse, in a child attacked with measles, at whose autopsy we found an erosion of the vocal chords.

An important fact to be noticed in the history of this symptom, is the period of its appearance. In children from two to four years of age, whatever were the circumstances under which the pneumonia was developed, and whenever it has appeared under our observation, the cough has always manifested itself at least a week before the decided commencement of the inflammation. In older subjects, in cases of an idiopathic inflammation, the cough, the acceleration of the pulse, and respiration, marked the opening of the disease, while in the contrary case, when the affection complicated a catarrh, the cough was heard before the signs of the pneumonia were at all marked.

The expectoration in our patients, from two to five years of age, was wanting, in the greater number of cases, and has been noted only four times; in one it was sero-spumous, in two others sero-mucous, and in the remaining one sero-mucous, tinged with vermilion-coloured blood. In those from six to fifteen years, it was nearly always present; in seven cases the sputa were coloured, and five times tinged with blood: in two cases of idiopathic pneumonia, they possessed the rusty tinge peculiar to the disease in the adult.

We arrive, thus, at the same result as Dr. Gerhard, who, in twenty patients, only met this kind of sputa three times.

In the young children it was very difficult to assure ourselves of the existence of pains in any part of the chest, both from their want of the power of expression, and the difficulty of the appreciation of their existence by percussion. We have, however, assured ourselves of the presence of this symptom in three cases, in two aged four years, and another five: one of the two former had been attacked at the hospital with the disease, while in tolerably good health: in the remaining two, the inflammation supervened in the course of, or soon after, the measles. In the two former the pain was seated below the nipple, in the latter it was sternal, and, consequently, not corresponding with the pneumonia, which was situated antero-posteriorly on the right, and postero-inferiorly on the left side. In patients from six to fifteen it was more often noted, as we have encountered it twelve times.

The epoch of the disease, at which the pain appears, is variable: sometimes it is the commencement, and, after a duration of some time, we have found, at the autopsy, old adhesions: at other times, the pain appeared at the end of the disease, or during the last days of life.

This thoracic pain was not as characteristic, nor of as long continuance, as in the adult: although really pleuritic, it has never, in our cases, lasted but from one to three days.

The thorax in the greater part of our patients was well formed: we have, however, observed in four cases that the chest was contracted in front, and compressed on the sides, in a very sensible degree: these children were aged twenty months, and two and three years. In two other subjects the chest was remarkably arched in front. Rickets, so frequent in children, is the special cause to which we are to attribute all these alterations of symmetry; but it would be difficult to determine exactly the precise influence of these deformities upon the production of pneumonia.

In children from two to five years of age, the decubitus was either on the back, or indifferent; but we must mention that the two patients, attacked with the pleuritic pain, changed immediately after its invasion their mode of lying; thus—before, they lay indifferently on one side or the other, but afterwards one preferred the side of the pain, the other the opposite. In the children between five and fifteen years, the decubitus has offered nothing specially worthy of note.

The respiration and the circulation were not the only functions offering remarkable disorders. The nervous system, so liable to impressions in the child, presented various lesions in two thirds of our cases—in all the young patients from two to five years, and in half of those from five to fifteen.

In the former, the symptoms consisted most generally in an anxiety and an agitation, sometimes carried to extremes. They showed themselves ordinarily at the commencement, and rarely

continued throughout the whole of the disease. In the greater part of our patients this excessive anxiety was very well explained by the extent of the disease, occupying the greater part of the lungs; but in a child of two years, presenting only a few nodules of pneumonia, it must be referred to the eruptive fever which coexisted with it.

Other patients, far from presenting this agitation, offered a remarkable prostration and somnolence: in two of these cases the disease attacked in tolerably good health, and the hepatisation occupied all the lobe of one lung.

The children from six to fifteen years, especially the youngest, presented sometimes an extreme anxiety, attended even with delirium: in other cases of the disease, complicating other affections, we observed a remarkable depression of the strength, frequent giddiness, &c. In a young girl, aged fifteen, attacked with the pneumonia during convalescence from typhoid fever, we observed the return of the typhoid cerebral symptoms at the same time with the development of the new inflammation.

In a single case only have we been able to observe those symptoms on the part of the nervous system, considered by some pathologists as simulating a cerebral affection. These *pseudo-meningites*, appearing in the course of a pneumonia, are not so common as they have been hitherto pretended: and if we glance at some of the observations reported as examples of this particular form, we find many of them to be well-marked cases of typhoid fever; for example, M. Leger's case, (pneumonia of the right side, with enteritis and ataxic symptoms.) Nevertheless, there do exist in the Gazette Médicale two or three examples of this particular form. Finally, in one of our younger patients, (a child of five years,) a pneumonia supervening in perfect health, assumed the typhoid character.

Headach was inappreciable in the greater number of our patients. Nevertheless, we have observed it once in the midst, and once at the commencement of the disease, both times in patients aged four to five years: five only of our older patients have made any complaint, nearly always at the commencement, and, at times, during the course of the disease. Of these five, four had idiopathic pneumonias, and the fifth a pneumonia accompanying measles. When the headach did exist, it was frontal, and was of no great intensity.

In more than three quarters of the cases the digestive tube was in a more or less abnormal state. Most were attacked with diarrhœa, slight in some cases, but more abundant in others, and constituting one of the affections during which the pneumonia frequently developed itself, (chronic enteritis.) The abdomen was without pain, tympanitic, or the contrary: the tongue, nearly always moist, was often covered with a white or yellowish coat.

In two children, one aged three and the other four years, there was slight spontaneous vomiting, but only in the first day of the disease. We have seen the appetite persist in some children

attacked with a pneumonia, which progressed very slowly, (it was of the simple lobular form in two of these.) In cases, on the contrary, where the inflammation was extensive, and assuming a very acute type, the anorexia was complete, and in these also the thirst was extreme, far exceeding any thing of the kind in the adult: thus, we have seen young children swallowing with avidity every liquid that was presented to them, and only desisting from the necessity of respiration.

In the older subjects the digestive tube has offered no remarkable symptom; thirst and anorexia have been noted in all the cases, and sometimes there existed vomiting.

After thus enumerating one by one all the symptoms presented by the pulmonary inflammation of children, we ought to examine them grouped together, forming a single morbid entity. We should seek to sketch a picture of the disease, showing its diagnosis, and the march of its different varieties. This will form the subject of the following chapter.

CHAPTER VII.

SKETCH OF THE DISEASE, ITS PROGRESS, &C.

Before commencing this description, what shall be the elements of our divisions? Shall it be the pathological anatomy? Shall we describe, as have done all our predecessors, the lobular and lobar pneumonias as two distinct diseases? Or, imitating the example of Gerhard, shall we form two great varieties, dependent on the ages of the patients attacked by the disease? Or, further, shall we divide our patients into two categories, according as the disease attacks in full health, or supervenes upon some other affection, which it complicates?

The details into which we have already entered have shown us, that the two forms of pneumonia are confounded by very appreciable gradations, and that the symptoms of a lobular pneumonia, become general through the lung, do not essentially differ from those of the lobar form: consequently, with the pathological anatomy for our sole guide, we should find ourselves obliged to divide very much our descriptions, for the same patient often presents on one side a simple lobular pneumonia, while in the other there exists the same form rapidly becoming general: now, how distinguish in the same patient the symptoms and the progress of these two diseases?

No more should age be the sole base of our divisions, since the study of symptoms demonstrates to us that the form assumed by the disease, and the progress that it follows, depend more upon the conditions in which it manifests itself, than upon the time of life

at which it overtakes the patient. Finally, the mere consideration of the anterior state of the health will no better assist us to class under one head all the varieties of the pneumonia of children.

Adopting, then, no one of these divisions exclusively, we will lay them all under contribution—and desirous of presenting a complete picture of the disease, of producing the physiognomy and the particular expression of its different varieties; in fine, of giving, in a word, a description which shall enable all, now unacquainted with the pneumonia of children, to arrive easily at its diagnosis, we have thought best to establish the following species—two principles have served us for basis. The first, that the form of the disease is dependent upon its exciting cause. The second, that the progress it follows partakes of the nature of the affection, in the course of which it is developed: thus, the simple lobular pneumonias become general, and the lobar pneumonias supervening upon a long-continued affection, are clothed with the particular attributes of chronic disease—while those, on the contrary, which arise in perfect health, or in the course of an acute disease, take to themselves the acute characteristics. Hence two divisions.

1. Simple lobular pneumonia, the lobular becoming slowly general, or the lobar form supervening in the course of a chronic affection.

2. The simple lobular, the lobular rapidly extending itself, or the lobar form attacking the patient in perfect health, or in the course of an acute disease.

The first species is peculiar to the younger children, supervening generally upon the chronic enterites so common at that age, sometimes after the exanthematous fevers, but in these latter long after the disappearance of the eruption.

As it thus appears in patients, emaciated and enfeebled by long standing disease, its external symptoms are not well defined. The cough is rare, sometimes even not present: the pain of the chest does not exist, the expectoration is wanting, the skin pale and cold, with œdema of the face and extremities: usually, however, at the moment when the disease tends to become generalised, there appears a movement of reaction, manifested by an acceleration of the pulse and respiration, and an increased heat of the skin.

The disease would, however, often continue completely latent, if auscultation, coming to our aid, did not reveal the symptoms of which a former full detail renders the enumeration unnecessary.

Despite the diarrhœa often colliquative, the appetite frequently remains in full force and the thirst is not augmented: the skin is covered with ecchymoses and furuncles. Ulcerations arise either on the nates or on blistered surfaces—the emaciation makes rapid progress and the patient succumbs in the last degree of marasmus.

Of all its forms, it is when in the simple lobular state that the pneumonia is most difficult of recognition, but then also its diagnosis is least important: supervening under the most unfavourable

conditions, and at an epoch when disease has already undermined the powers of life, it adds but little to the gravity of the prognosis. Surely it well merits the name of asthenic, given by M. de la Berge: but this appellation applies throughout its whole extent, without any particular reference to his supposed second period, which we confess has always escaped us. But even if we would establish two periods for the disease, the first should be the asthenic and the latter the sthenic, since, (as we have already explained) the reaction takes place in these cases only at the moment of the generalisation of the pneumonia, and this generalisation is the last period of the disease, the one immediately preceding the fatal termination.

2. The simple lobular, the lobular generalised, appearing in an acute disease, with the lobar species under the same circumstances or in perfect health, assuming an acute form, constitute our second division. They all follow the same course in children from two to five years: in those from five to fifteen they present some slight differences between themselves.

The pneumonia of the former age presents two well marked distinct periods, the one, which may be called catarrhal, the other inflammatory.

The catarrhal stage presents nothing constant as to its length of duration, but is always appreciable by its cough, generally not intense, slight alterations of the respiratory murmur, the sonorous or sibilant râles, the mucous cracklings, &c., without any acceleration of the pulse or respiration: the appetite is preserved, and the child still continues its sports, until finally there appears suddenly and simultaneously an acceleration both of the pulse and respiration, (marking the second period:) the skin becomes burning, the alæ nasi are widely dilated, and there is an anxious expression of the face: the agitation, sometimes extreme, is replaced in other cases by a remarkable somnolence and prostration: the auscultator in the first hours of the disease, recognises an obscurity of the respiratory murmur, or a subcrepitous râle, without appreciable dulness upon percussion; later there appears a bronchial expiration, accompanied by the same râle, the bronchial character finally extending itself to both times of the respiration together with a notable dulness upon percussion: the general symptoms preserve all their intensity as long as the pulmonary inflammation makes any progress.

At last the moment arrives when the pulsations and respirations become irregular, the pulse extremely weak, the face purple, the extremities cold: the prostration gives place to an anxiety in the whole performance of the functions, the cough ceases; the young patients are attacked with prolonged gapings, uttering deep sighs, the pulse finally becomes insensible and death closes the scene. The progress of the hepatisation is sometimes so rapid as to produce death in two or three days.

In cases where the disease is to terminate favourably, the subcrepitous râle begins to reappear, the bronchial sound is limited to

the summit of the lung or the root of the bronchi, and the respiratory murmur is again heard: while the local state is thus ameliorating, the general symptoms lose their intensity; thus, the pulsations and respirations are quickly diminished in number, the heat of the skin gives place to a pleasant moisture, with disappearance of the anxiety, &c. This resolution usually commences the seventh or eighth day, but even as late as the twentieth the last traces of the râle have not in some cases disappeared.

These remarks apply specially to children from two to five years. In those from five to fifteen the differences in the progress of the pneumonia are somewhat important: it may attack in two circumstances,—in the course of another disease, or in the midst of perfect health. In the former case if the malady which it complicates be catarrhal, we find the two periods much the same as in the younger class of children.

If the pre-existing disease be not catarrhal, (typhoid fever, small pox,) the pneumonia is remarkable for its insidious approach, a cough is hardly present, the pain in the chest and the expectoration are entirely wanting; and as the pulmonary affection is developed in the course of a febrile disease, we can with difficulty assure ourselves of the acceleration of the pulse or respiration. But there is one important symptom which may serve to arouse suspicion of the commencement of the disease—the deep change of the expression of the face, which we find noted in all our observations.

The idiopathic form does not differ in a sensible manner from the same disease in the adult. It commences by fever, thirst, anorexia, pain in the head, cough, pain in the chest, and sometimes vomiting: auscultation discovers a crepitous râle, bronchial respiration and bronchophony; the expectoration is often bloody but rarely rusty; the acceleration of the pulse and respiration is considerable. The nervous symptoms are sometimes rather pronounced, and we observe intense headach with anxiety or even delirium. According to Gerhard and Rufz the mean duration of this form is fourteen days. In the few cases we have seen, it has been much longer; one of our patients quitted the hospital the twenty-first day of his disease with the bronchial respiration still present; and in another the subcrepitous râle, which had succeeded it, endured six weeks.

CHAPTER VIII.

DIAGNOSIS.

After this exposition of the symptoms to assist us in the recognition of the pneumonia of children, let us see if there be no danger of confounding it with any other disease of the respiratory organs.

For example, what are the differences between pneumonia and pleurisy, bronchitis and phthisis. Simple *pleurisy* is a very rare disease in children from two to five years; for our part, we have never met it, for whenever we have found a liquid in the pleural cavity, there has always existed an hepatisation of the lung, thus usually confounding the symptoms of the pneumonia with those of the pleurisy. In one case the absence of all respiratory sound, where a bronchial respiration had been heard, immediately after the declaration of a pleuritic pain, enabled us to recognise an effusion complicating the hepatisation. We may also remark, that the access of suffocation, mentioned in two of our observations, appeared of some value as diagnostic of an effusion into the pleural cavity. But we must not assign too much importance to this symptom, as we are not certain that a rapid hepatisation may not give rise to the same phenomenon. Among the observations of MM. Constant and de la Berge, we find two of a pleuritic effusion diagnosticated by percussion and change of position.

In the older children, simple pleurisy is still a rare affection, differing however in nothing from the same disease in the adult.

A *bronchitis* severe enough to produce constitutional symptoms is certainly very rare in children from two to five years. In the immense majority of cases, when it puts on this form, it is complicated with lobular pneumonia, and we have, in speaking of the diagnosis of this latter, alluded to the great difficulty of distinguishing these two affections, especially where the bronchial element is predominant. A catarrh in the younger children not determining any symptoms of reaction is characterised by cough, sonorous and sibilant râles, mucous cracklings or even the subcrepitous râle, but this latter is in general of short duration and its bubbles are very unequal. As we have often heard a subcrepitous râle in cases where we have afterwards found pneumonia, we would guard against being understood to assert a subcrepitous râle heard on both sides of the back to be a *pathognomonic* sign of bronchitis, such an assertion would be in flagrant contradiction to facts, which we have detailed above.

In children from five to fifteen years, a pulmonary catarrh frequently complicates other affections, measles, hooping-cough, typhoid fever, &c., but it is also observed idiopathically, and then it presents no difference in its symptoms with that of the adult.

The tuberculous affection of the lung; can this simulate a pneumonia? In speaking of vesicular pneumonia we had occasion to remark that a superficial examination might mistake the granulations of inflammation for those of tubercles, and we have thus pointed out their characteristic differences. Inattentive observers also might regard the small abscesses of the lung as tubercular excavations, but in those latter when existing in the parenchyma, the surrounding tissue and the age at which they occur prevent all mistakes of this nature. In fact we all know that in children, of

two or three years, the tuberculous affection is rare, and that in the cases where it is found to occur, the tubercles have never advanced beyond the crude state. In older subjects, phthisis becomes extremely frequent, but its chronic character most generally diagnosticates it from pneumonia. The diagnosis however is often very obscure, especially when we are deprived of an accurate information of the origin and progress of the disease.—To choose some examples illustrative of this subject. A child has the skin hot, an intense fever, dulness on percussion, and bronchial respiration under one of the clavicles. Is it attacked with pneumonia? We have frequently seen this question decided in the affirmative and a treatment, consequent upon such a view, applied to the case; but nevertheless the autopsy has proved these symptoms, in the great majority of the cases, to be dependent upon a tuberculous infiltration of the lung. Besides such a diagnosis might be given *à priori*, as a glance at our table of the seat of the lesions shows only two cases of pneumonia limited to the anterior portion of the lung, and only one of hepatisation immediately beneath the clavicle. The signs of an idiopathic pneumonia under the clavicle, although rare, do sometimes exist, when this affection is developed in a tuberculous subject. And as the young patients are often brought to the hospital for the complication alone, with the very incomplete information we can obtain of the former health, we might easily overlook the original disease, and give a prognosis founded on too favourable a view of the case. In these difficult cases great regard is to be paid to the intensity of the febrile movement, and the progress of the disease. Thus, a persistence of the physical, after the decline of the rational, symptoms is very probably due to a tuberculous affection. But finally, when the tubercles, surrounded with the pneumonia, exist at the posterior part of the lung, the difficulty of the diagnosis increases greatly, from the doubt created by the seat of the disease.

And this is not all; when the tuberculous affection, instead of being confined to a limited space, is scattered profusely through the whole parenchyma, as is so common in the acute phthisis of children, the diagnosis is far from being clear. Thus, in those cases of equally disseminated tubercles, without any surrounding pneumonia or bronchitis, we have many times found no other physical signs than a rudeness of the respiratory murmur; and if there be bronchitis or presence of mucus, we have a mucous or subcrepitous râle; very nearly the same symptoms as in the simple lobular pneumonia. Now as this latter affection, as well as phthisis, is the frequent successor of measles, we can, in such a case, only form our diagnosis upon the collateral evidence and the final progress of the disease. Suppose, in a case of hereditary predisposition to tubercles, we observe, after measles, that the cough continues, that for a month after there is still heard the mucous râle, and that the child emaciates with an attack of fever, each evening; with

these symptoms alone we might suspect the existence of tubercles. If, however, after the measles in a healthy well constituted child, there still exists a violent fever, cough, mucous or subcrepitous râles, succeeded by an expiration and then bronchial respiration, we might believe in a lobular pneumonia which has finished by becoming general. We see, therefore, there are many cases where error is easy, and we ought to suspend our diagnosis till after some days' examination.

Finally in a last case, the difficulty of the diagnosis depends no longer merely on the combination of the phthisis and the pneumonia, but lies entirely in the particular form of this latter affection. If, in fact, we recall the particular character given to our first species, we shall recognise in them nearly all the symptoms of phthisis arrived at its last degree. The cough, the colliquative diarrhœa, the extreme emaciation, the paleness of the skin, the infiltration of the extremities, &c., what are these but the collection of symptoms assigned by all pathologists to the tubercular disease, in its most advanced stage. Despite an appearance so deceitful, however, the diagnosis will not be very difficult, since it must be one of two things; either the pneumonia will be simple, and then, the physical signs bearing no proportion to the gravity of the constitutional affection, will indicate that we have to do with a limited affection of the lung, as a tubercular disease accompanied by such grave general symptoms presents ordinarily physical signs indicating a considerable alteration of the pulmonary parenchyma, or else the pneumonia will have passed to a generalisation and assumed the lobar form, and the stethoscope will inform us that the disease exists at the posterior part of the lung, is double, &c. &c.; in a word, we shall recognise by it all the signs of a pneumonia. The progress of the malady will also present various differences between the two diseases; thus, generally the diarrhœa precedes the cough in the pneumonia, while in phthisis it appears at a period more or less distant from the commencement of the disease. And to conclude with the final difference, we will cite the age at which both the affections are developed. Our first variety of pneumonia is most often met with in children of two and three years of age, while at that period of life pulmonary phthisis is very rare.

CHAPTER IX.

PROGNOSIS.

The gravity of the prognosis varies with the age and the different forms of the disease. It may be advanced, as a general proposition, that a pneumonia is the more dangerous in proportion to the youth of the patient. Our tables very manifestly prove this, and the re-

searches of MM. Valleix and Vernois, at the Hospital of the Enfans-Trouvés, give a further weight of evidence to this assertion. As to the influence of the different forms, the pneumonias of our first species are grave in consequence of the disease which they complicate. They are, in fact, nearly necessarily mortal. Grounding upon the experience of our predecessors, and upon our own in particular, we would call them always fatal, if it were not for a remarkable case before us, of recovery in a child placed under the most unfavourable circumstances.

The secondary forms of pneumonia are, at all ages, of an extreme gravity: thus, of eighty-one pneumonias, complicating very various diseases, observed in our service in 1837, seventy-seven have terminated fatally. The pneumonias in the youngest children, supervening upon a good state of health, or merely upon a slight catarrh, most usually recover: eight patients, from three to five years of age, have recovered from the disease under these circumstances. And, finally, the inflammation of the lung, in children from five to fifteen years, occurring in good health, arrives, in the immense majority of cases, at a happy issue. All the patients of this latter category have recovered: this result, based on so few facts, might be contested, if other observers (Gerhard and Rufz) had not arrived at the same conclusion, after an examination of a much larger number of cases.

A general prognosis from the study of the circumstances of the developement of the disease being thus established, it remains to enquire if particular symptoms indicate, in any positive manner, a greater or less gravity of the affection. The state of the pulse is one to afford us the greatest aid. Its acceleration is generally in a direct proportion to the intensity of the disease: but, in addition, at an advanced period of the malady, we have observed a character already mentioned, but upon which we would especially insist in this connection, viz: the *smallness* of the pulse. Every time, when this has been noted, death has not failed to appear in a few hours, or a couple of days at the utmost. The cessation of the cough, the chilliness of the extremities, the purple hue of the face, coincide ordinarily with this smallness of the pulse, and announce a speedy dissolution.

CHAPTER X.

TREATMENT.

The therapeutical is, without dispute, of all parts of a monograph, the one meriting the most serious attention. The final end of all medical research, it constitutes the only portion really practical.

Therefore, in the study of the treatment, we have not confined ourselves solely to our own observations, but have laid under contribution those of our predecessors. Unfortunately, too often their assertions are contradictory, and their opinions without proof.

In the hope that an examination of particular facts might throw some light upon this present question, we have analysed, with a special care, nearly ninety observations, inserted in different journals of medicine, or in the different monographs already alluded to: but we have to regret the little fruit of our labour, in consequence of the lamentable deficiency of detail.

In the interpretation of facts, as also in the estimation of the therapeutic value of our observations, we have adopted the following method:—after as complete as possible an assurance of the proper administration of the remedy, we have endeavoured to appreciate its influence upon the progress of the disease, and we have laid particular stress upon the period at which the treatment has been commenced.

The comparative variations of the pulse and respiration, together with the physical signs, have served us to denote the increase or decrease of the disease. We have, besides, examined the action of the remedy, considered both in the first dose, and after a continuation of several successive days. And, finally, in the appreciation of the final result, (death or recovery,) we have taken into the account, as an essential element, the nature of the pneumonia which we had had to treat; for, if our details upon the subject of prognosis be remembered, the reader will recollect the immense influence upon the termination of the disease exerted by the conditions of its development.

With the exception of some particular medication, exacted by special indications, the treatment has always been composed of two parts: one common to all diseases, (hygiène,) the other special to the disease before us: we commence with this latter.

The principal measures directed against the inflammation have been, 1. Bleeding; 2. Antimonials; 3. Derivatives applied to the cutaneous system.

We shall first examine the effects of the separate employment of each of these remedies, and then the influence of all combined.

Bleeding.

Opinions of authors vary much as to the influence of bleeding in the pneumonia of children. Thus, some proscribe it absolutely, while others make it the basis of their treatment. Some prefer general, others local bleeding. It should be remarked, that those employing the bleeding, dread to carry it too far, lest the patient may never recover from the collapse. We have cited, however, an observation (perhaps unique in science) of a child treated by the formula of repeated venesection. A favourable issue, however, in this single case would not induce us to dare to imitate such an ex-

periment. It must be remembered, however, that the child, though only aged two years, was in perfect health at the commencement of the disease, and, therefore, in the most favourable situation: and further, when we scrutinise the details of the case, we find the amelioration to have commenced only the seventh day from the invasion, that is to say, the bleeding does not appear to have sensibly advanced the epoch of the usual resolution of the hepatisation.

Having just said that practitioners did not push very far the loss of blood, we give here their usual method. In children from two to four years, local bleedings are generally alone employed, either by leeches or cupping glasses. At this age, twelve or fifteen leeches, three or four times repeated, are the usual extent. In older children, they employ bleeding from the arm proportionate to the age of the child and the intensity of the disease; thus, in a child from five to eight years, four to eight ounces of blood *at once:* in those from eight to fifteen, eight to twelve ounces.

In some particular observations, this moment under our eyes, (Gazette Médicale,) we noticed bleeding to nine ounces, repeated twice, thrice, and four times in children from twelve to fourteen years.

After this general indication of the methods of different practitioners in the employment of this remedy, we will discuss the efficacy of such a treatment. Here we shall find a wide difference between the idiopathic and the complicated pneumonias. Gerhard thinks copious bleedings may be of advantage in the idiopathic pneumonia of children from six to fifteen years. He has remarked the immediate effect to be a diminution of the intensity of the general symptoms, (headach, agitation, oppression, &c.,) without, however, any appreciable influence upon the duration of the disease.

The analysis which we have made of different observations does not comprise all these results: we find in many the bleedings, even copious, to have had not only no appreciable effect on the pulse or respiration, but also none upon the patient's general condition. Thus, M. Blache has inserted, in the Archives de Médecine, (1837,) several cases of pneumonia, in which no amelioration whatever followed the loss of blood. Besides, we may make this general remark, that the amendment in the symptoms succeeds rarely to the first bleeding, but follows only the second or third, at a time corresponding to the seventh and ninth days of the disease. We may, therefore, establish as a principle, that, although of some advantage in idiopathic pneumonia, the utility of bleeding appears restrained within very narrow limits.

If, now, we attempt an appreciation of its influence in the complicated species of the disease, we shall be struck with its want of influence not only upon the termination, which is nearly always fatal, but also upon the progress of the disease, which undergoes no sensible modification. If proofs are sought, we have only to glance

at the observations, by M. Blache, of pneumonia complicating hooping-cough, to read the reflections of M. Baudin on the treatment of the disease after measles, or consult many other observations scattered in the different periodicals, and we shall be terrified with the immense proportion of the mortality, and the complete inefficacy of the subtraction of blood.

We may add, in confirmation, that M. Becquerel, who made his observations in a service where this mode of treatment was solely employed, has never seen a case of recovery in the disease, complicating a pre-existing affection.

To give some idea of the action of bleeding, we will report succinctly the history of three of our patients, the only ones submitted to this treatment. Their ages were two, five, and six years: in the first two the disease was developed in tolerable health, in the third it complicated a hooping-cough. In the first, (the child of two years) on the sixth day of the disease, five leeches were applied to the right side, the bites of which furnished an abundant quantity of blood. On the morrow there was a sensible amelioration, the pulse had fallen from 160 to 120; the bronchial respiration and the dulness on percussion, which before occupied the whole of the inferior lobe, were much scattered; the coloration of the countenance gave place to paleness; a calm succeeded to the agitation, &c.

The child of five years was bled, the *sixth day*, to six ounces, when the pulse was 140, the respiration 36, and a bronchial respiration existed in the middle third of the right lung: the morrow, seventh day, the respiration was bronchial in both its times, the percussion but slightly resonant in these points, the pulse 120, respirations 44. Six leeches were applied to the right side. The eighth day the pulse was 120, the respiration 34, and the bronchial respiration was heard in the whole height of the lung. The ninth day, pulse 120, respiration 34, bronchial respiration limited to the summit, with subcrepitous râle beneath. The tenth day, pulse 100, respiration 28, bronchial respiration at the summit, &c.

In these two cases there appears to have been some influence exerted upon the progress of the disease. But it should be remarked that if, in the first, the amelioration succeeded immediately the application of the leeches, it was only definitive on the seventh day, that is to say, at the very time when the pneumonia, supervening in good health, has the greatest tendency to assume, of itself, a favourable change.

In the second, the resolution of the pneumonia appeared only the ninth day, despite the bleedings of the sixth and seventh. And as to the final result, (recovery,) we must recollect that our patients were both placed in very favourable circumstances, and in a class of the disease nearly always terminating in health.

Our third child was not in the same condition: the pneumonia appeared in the midst of a hooping-cough, or rather of a catarrh, with very intense paroxysms, and the disease had already deter-

mined a formidable constitutional reaction when the inflammation of the lung was developed: so great a loss of blood, (one bleeding of six ounces, and twenty-two leeches applied at different times,) exerted no influence upon the pulse, respiration, or march of the disease.

Antimonials—Tartar Emetic.

In the examination of the effects of antimonials, and of the tartar emetic in particular, we were obliged, from the complete want of published facts, to have recourse solely to our own observations. We find, it is true, many cases in authors, entitled *cure of pneumonia by tartar emetic*, but in nearly all, bleeding has been employed in concert, constituting the mixed method, of which we shall soon have occasion to speak.

Nine of our patients took the tartar emetic carried to a high dose. Six of them were aged from two to six years, three from eleven to fourteen. The portion given to the youngest contained three and four grains,[1] in five ounces of the vehicle; for the older, the dose was five to six grains. They took a spoonful every two hours, and when the first produced vomiting, they delayed the following doses: in general, a tolerance was quickly established, though sometimes we had to encounter vomitings, and, in one case, a somewhat profuse diarrhœa, lasting several days.

The vomitings seldom endured after the first dose, or, in general, they were not numerous, and ceased sometimes even under an increased dose of the remedy. We have never seen any accidents from this medicament, except in two cases of a pustular inflammation of the fauces. This inflammation, due entirely to the local action of the remedy, and so frequent in the adult, has been observed in nearly all the patients of this year, treated with the tartar emetic: it presents no particular gravity, and yields usually in young children, as well as in older subjects, to the simple emollients.

What has been the influence of the tartar emetic upon the termination and the principal symptoms of the disease? Of nine patients four have recovered, and two of these under rather unfavourable circumstances: thus, one had a pneumonia after small-pox, the other a double pneumonia, complicating the measles. Our third was a child of three years, attacked from the commencement with a slight catarrh and a chronic eczema: and, finally, the fourth case of recovery is a young girl of eleven years, of a scrofulous constitution, but otherwise in good health at the commencement. Two of these commenced the treatment the first day, the other two at the sixth day only. The whole quantity taken by each has varied from sixteen to twenty-four grains. In these four patients the

[1] In giving the amount of doses of medicine, the quantity per diem is intended, this being the form of prescription in the Parisian hospitals.—*P.*

emetic tartar appeared to exert some influence upon the pulse and upon the respiration, but this influence has not been in all the cases durable, and in three of the cases it manifested itself nearly at the same epoch in all, viz: from the seventh to the ninth day of the disease. As to the patients who succumbed, they were placed in the most unfavourable circumstances: three were already attacked with measles and with typhoid fever, and the remaining one was a child of two years, with a double pneumonia complicated with a pleuritic effusion. We have, however, been able to remark a decided influence upon the pulse and respiration, even in those of the fatal cases, where the dose was a little elevated: but there was no decided effect upon two patients who took only six grains.

If we sought to draw any general conclusions from this small number of facts, we should say, but with reserve, from the smallness of our numbers, that the tartar emetic may be employed with success in the child; that there is no danger in a somewhat elevated dose; that the tolerance is generally easily established; that the gastro-intestinal accidents give little cause of fear; and, finally, that this medicament appears to act more directly upon the pulse and respiration than upon the hepatisation itself.

The combined Method of Treatment, Bleeding and the Tartar Emetic.

After this attempt at a separate estimation of the value of bleeding and the tartar emetic, we will examine their combined influence upon the disease before us. We have discovered in various authors thirteen cases, giving somewhat circumstantial details upon this mode of treatment. In all these cases the tartar emetic has been given after more or less copious bleeding, and at some distance from the commencement of the disease. All the patients thus treated and attacked with idiopathic pneumonia, (aged from nine to twelve years,) have recovered, with the single exception of one, who succumbed, with a gangrene of the mouth supervening upon the pneumonia. Two children, in whom the pneumonia was developed around a tuberculous affection, have died, although in one of them there took place a very sensible amendment of the symptoms after the first dose of the antimony. As to the influence of this method of medication upon the progress of the disease, it has appeared to us, after an attentive perusal of the foregoing observations, that the combination of the two methods exerts a more decided influence upon the general and local symptoms than the employment of either one separately. Thus, although in general the amelioration appears from the seventh to the ninth day, as in the cases treated by the tartar emetic simply, we find in two or three cases an amendment of the symptoms on the fifth or sixth day; and more than this, in all the cases, even in those terminating fatally, a diminution of the pulse and respiration succeeded the first dose of the medicament, whatever was the period of the dis-

ease at which it was employed. Three of our patients were submitted to the combined treatment of bleeding and antimonials: all three were bled once or twice, and took besides, one the tartar emetic, another kermes mineral, and the third both the tartar emetic and the kermes. The tartar emetic was always given in the dose of one or two grains in a large quantity of water as vehicle, and determined numerous vomitings. The three patients submitted to this treatment recovered, but the pneumonias were all idiopathic, and the amelioration took place from the seventh to the ninth day.

The facts already published are by no means sufficiently numerous to decide the grand question of the mode of action of the tartar emetic. Is it by absorption, or does it merely determine, by the vomitings, a salutary revulsion upon the digestive canal? Both these hypotheses are, perhaps, just; in some proof of which, on the one hand, the emetic tartar carried to a large dose, without vomiting, appeared to have exerted a happy influence upon the disease—while, on the other hand, a rapid amelioration followed its employment in doses producing vomiting in two or three patients, whose cases are now before us. In several of these cases, the analysis of which forms the basis of this article, we see that the dose of the emetic was sometimes carried to a great extent—thus, a child of fourteen years took, in all, one hundred grains, and even as high as ten grains, in the twenty-four hours; another, aged nine years, took daily from six to eight grains, &c. &c. In all these cases not the least accident has resulted.

White Oxide of Antimony—Pulvis Antimonialis.

Eighteen of our patients were treated with this medicament; ten in large doses, and eight in small. We have but little to remark upon these latter cases, as the remedy was never given at the commencement, nor throughout the whole disease. In these eight, the dose per diem varied between ten and eighteen grains in four ounces of vehicle, to which was added ʒij. or ʒiij. of syrup of diacodium, (syrup of poppies.)[1] All these children, except one, are in our first division—that is, pneumonia supervening upon some chronic affection. Two of these recovered, but this cannot be attributed to the remedy; in one case it was not commenced till the ninth day, when the pneumonia already tended to a resolution, whilst, in the other, (a child of eleven years, attacked with small-pox,) it was administered for only a single day.

Of the other ten, we must eliminate two, who, dying the day after their entrance of very extensive pneumonias, took, consequently, only one potion of the remedy. The pulvis antimonialis was administered to children between two and five years of age.

[1] The syrup of poppies of the London Pharmacopœia, as given in the United States Dispensatory, resembles the syrup of diacodium sufficiently to be considered as identical with it.—*P.*

One other, aged six and a half years, who was attacked with a general capillary and vesicular bronchitis, cannot, consequently, be included among the pneumonias.

The powder was given in emulsion or mucilage, in the dose (for children of two and three years) of half a dram in the twenty-four hours, carried as high as a dram and a half, or even two drams. Children of four and five years took from one up to three drams, or even half an ounce.

Of these eight patients only one recovered, who had a lobar pneumonia involving the whole lobe. Of the others there was, perhaps, only one susceptible of recovery, judging from the progress of the disease, the pathological anatomy, and the absence of complication. The influence of this medication has appeared almost nothing upon the pulse and respiration, whether after a single dose, or many days' employment: if sometimes the pulsations did diminish in number, at others they increased, or remained the same. The same remark applies to the respiration, the variations of which presented no accordance with those of the pulse. But, upon the progress of the disease its influence was still less—in almost no case was there a sensible amelioration. In the only patient who recovered it was after the sixteenth dose, (the eighth day,) that the alteration for the better manifested itself, and the disease lasted, in all, eighteen or nineteen days, which would seem to indicate no abridgment from the pulvis antimonialis. However, the following happened in one of our patients: after the first dose, the pulse increased from 120 to 150, the respiration from 46 to 50, the physical signs remaining the same; but, after four days of its administration, an amelioration was declared in all the symptoms, the pulse fell 30 beats, and the inspirations instead of 50 were 44: and the auscultation confirmed this great amelioration. The dose of the powder was diminished, and the next day all the symptoms reappeared as violent as ever. It was increased again, the pulse fell to 100, the respiration to 34, without any sensible amelioration in the physical signs: the amendment, however, did not continue; all the symptoms were soon aggravated; and death did not delay its appearance.

In this case, if the pulvis antimonialis really did exert no manifest influence, at least the coincidence between the administration of the remedy and the amelioration of the symptoms is a little remarkable.

We have never observed any action of this powder upon the digestive tube, nor any accident from its employment. It must be allowed to have the power of slightly exciting the gastric mucous membrane, since in two of our patients treated the one with high and the other with small doses, and in whose stomachs, at the autopsy, we found some of the powder, there existed patches of redness, more or less vivid, at those points where it was in contact with the mucous membrane.

The different observations published upon the employment of the antimonial powder in the pneumonias of children do not at all contradict the results at which we have arrived. In many of them we can discover no influence of the remedy upon the pulse, respiration, or the inflammation itself; and in many, where its influence upon the progress of the disease is vaunted, it would seem impossible to decide whether the amelioration was due to the remedy, or whether nature herself had not performed the cure, the precise period of the commencement of the disease not being indicated in the observations.

It must be remembered that all our patients except in the case of recovery, were in the first category, that is, of pneumonias accompanying some other grave disease, which are very universally fatal.

Precipitated Sulphuret of Antimony.—Kermes Mineral.

We have no where found any detailed observations upon the use of the kermes mineral in the pneumonia of children; we must therefore have recourse solely to our own observations. Fifteen patients were treated by this medicament: of these we must eliminate four, to whom it was given in a small dose, as adjuvant merely, and not forming the basis of the treatment, and three others, in whom the disease was already too advanced to hope for any relief, death supervening the day of the commencement of the treatment.

The remaining eight patients were aged between four and fourteen years, embracing therefore pneumonias of all the ages and species. The kermes was administered in doses of one and two grains to commence; and was carried successively to twelve, fifteen or even seventeen grains in the twenty-four hours, augmenting a grain about every visit; of these eight patients, three recovered, from an inflammation of all one lung, or a lobular pneumonia. Among the other five, there was only one perhaps capable of recovery, since he alone had no primitive grave complication: his pneumonia was well marked lobular, but so extensive at the day of entrance, that a fatal termination was prognosticated from the commencement.

If now we attempt to seek the influence of the kermes upon the pulse, respiration, and stethoscopic signs, we find these three symptoms in some cases increased, in others diminished, and in others remaining stationary. The general idea, however, which remains after an examination of the result of the treatment in all these patients, is that the kermes has exerted a favourable influence more often than otherwise, and therefore that it is a tolerably efficient remedy. But if we come to the analysis of each separate fact, we find that the cases, where the symptoms were aggravated after several days of treatment were precisely those, where the pneumonia was of our first species, and therefore almost necessarily fatal. Among those on the contrary, terminating in health, are

found the idiopathic and lobar forms, free from all complication, where, according to Gerhard and Rufz, recovery is certain whatever may be the treatment. Besides a certain number of our patients have entered when the disease had reached its maximum of intensity, and when an amelioration after the first dose of kermes is rather to be attributed to the arrival of the disease at its natural climax. Thus a child of four years was submitted to our observation the seventh or eighth day of an idiopathic lobar pneumonia with pure bronchial respiration; he took a grain of kermes and the next day he had the returning crepitous râle, and two days after a diminution of all the symptoms. Is the amelioration to be attributed to the kermes taken these three days, or to the natural progress of the disease? The latter appears to us the more probable. Observe in fact, that in all our cases of supposed beneficial effects of remedies, it is always at the same period of the disease that the amelioration manifests itself—from the seventh to the ninth day—we cannot, however, refuse to admit some influence to the kermes, as we have established its power in diminishing the pulse and respiration in several cases, both immediately after the first dose, as well as after several days of treatment, in patients gravely affected, and attacked with complications finally resulting in death. We possess, besides, one case of recovery in a lobular pneumonia after measles, under the sole use of the kermes: and this pneumonia although exempt from any unfavourable complication, was not the less grave, considering the cause to which it owed its birth.

In some cases the kermes has been administered at a very high dose, especially for a child. Seventeen grains are more than is habitually given to an adult; a dose apparently so enormous has had no unpleasant influence upon the digestive organs! Here is the result of our experience.

Our patient who took the seventeen grains, and who recovered, presented before the administration of the kermes, some symptoms referable to the digestive tubes—bilious vomitings, diarrhœa, and abdominal pains. These symptoms underwent no augmentation under the increasing doses; after about fifteen days they ceased altogether, although the patient was then taking thirteen or fourteen grains in the twenty-four hours.

In another who took fifteen grains and who died, we observed before the first dose the same symptoms connected with the intestinal canal; but these symptoms increased with the inflammation of the lung, and at the autopsy we found an inflammation of the gastric mucous membrane, slight in extent it is true, but very well marked, especially where there yet remained a portion of the kermes. We have never observed any other accident requiring a suspension of this treatment.

To conclude the history of the kermes mineral, we give a succinct extract from the observation of one of our patients treated by bleeding, the tartar emetic and this latter substance; the reader may thus judge of the combined action of the three.

It is the case of a child aged ten years, at the fifth day of a pneumonia of the lower half of the left lung, with bronchial respiration, absence of râle, and dulness upon percussion. Infusion of mallows, syrup of gum, with gr. ij. tartar emetic, looch,[1] bleeding to eight ounces, diet. The tartar emetic thus administered produced frequent vomiting, and on the morrow the pulse had augmented from 122 to 152; the inspirations had diminished from 82 to 62, the bronchial respiration had extended a little superiorly, but a crepitous râle was heard after cough inferiorly. This first prescription had at once augmented and ameliorated the gravity of the symptoms. (Infusion of mallows, syrup of gum, looch, with kermes gr. ij. the half of an emollient enema, diet.)

The day after this first administration of the kermes, seventh day of the disease, diminution of the bronchial respiration, more abundant râle, the inspirations have fallen from 60 to 36, the pulse from 132 to 96. The treatment is continued with the addition only of a bouillon. But on the eighth day the râle had disappeared, the bronchial respiration was in the same extent, the pulse was 150, the respiration 36. (Emetised whey, gr. ij.; blister to the legs.)

The following day the bronchial respiration had extended, but there was but little râle; respirations 50, pulse 132. This day the kermes was resumed in a dose of two grains, with one half an ounce of syrup of poppies. The disease continued augmenting, till the thirteenth day, when the patient took five grains of kermes. But the fourteenth day, the bronchial respiration was less, the crepitous rale of return again appeared every where.

From this moment the patient continued improving until complete convalescence, and on the nineteenth day the respiration was pure on both sides. The kermes was continued a few days after this happy result. We see, in this case, only a dubious salutary influence of the bleeding and tartar emetic, as it was only on the seventh day of the disease that an amelioration took place; the kermes was not sufficient to continue this improvement, and a relapse was the consequence. The tartar emetic was again given, with a similar result, and it was only on the fourteenth day of the disease, the sixth of the relapse, that the patient was definitively better under the influence of the kermes. Should we in this case attribute the cure to the remedy, or shall we think that the disease has followed its own course without any regard to its influence?

Derivatives to the skin—Vesicatories.

Vesicatories have been employed in conjunction with the other remedies and nearly always at an advanced period of the disease. They have been applied either to the diseased side or to the ex-

[1] Looch is an emulsion of almonds and sugar containing some gum tragacanth: it is entirely demulcent.—*P.*

tremities. They have not appeared to modify the course of the affection, and they have caused the patient such inconvenience, as ought to proscribe their employment. In fact the skin of the posterior part of the thorax, in contact with the soiled linen, compressed by the projecting ribs, excavates and ulcerates, in a manner very painful and difficult to heal, and adding still more to the gravity of the prognosis. It is especially with regard to the patients in our first category that we have made this remark, which besides has not escaped M. de la Berge.

These remarks upon blisters are equally applicable to the Burgundy pitch plasters sprinkled with the tartar emetic, which have been applied to some of our patients.

We should not forget among the revulsives, the cupping glasses which we have seen applied in some cases. Ordinarily dry cupping only is employed in the younger children; in the older, however, the scarificators were added, thus answering the indications of a local bleeding, and a derivative. The cases of the employment of these means are too few to estimate their therapeutic value.

In concluding this history of the different active agents put in force against the pneumonia of children, we will still revert to a general remark upon which we have always insisted, viz: that the first signs of amelioration appear in nearly all the cases, at the same period of the disease, from the seventh to the ninth day, whatever be the treatment employed. This fact tends to lessen greatly the influence of remedies, not upon the termination (we put aside this view of the question) but upon the course of the disease. It proves also that pneumonia has a period of increase which it must fulfil, and that the different medications directed against it are perfectly powerless in arresting its ascending progress:—the proof of this is in the fact, that in cases where no treatment has been employed, an amelioration has not been the less manifest at this same period of the disease. Of this we have one remarkable example.

The second part of the treatment now requires our attention, consisting of emollients, sedatives, and at times of tonics. The usual beverage was infusion of mallows sweetened with syrup of gum; in addition, usually, julaps containing from ʒij to ʒss of syrup of poppies. When the child was debilitated by a preceding disease, or when the constitution was feeble and delicate, there was added ʒss of syrup of cinchona.

Whenever any other disease, complicating the pneumonia, presented any pressing indication, it was combated by the appropriate remedies.

The young patients were rarely submitted to an absolute diet.[1] In those of the first category, whenever there was appetite, food was granted. In the younger patients attacked with acute pneumonia, the anorexia being usually complete, all aliment was with-

[1] The French *diète* is here and in all other places rendered literally, as meaning the deprivation of all nourishment of whatsoever species.—*P.*

held for the first three or four days of the disease—but immediately on any appearance of appetite, the light soups, milk, and bouillon were prescribed. Young children support badly an absolute diet, and the disease is aggravated by many successive days' deprivation of nourishment. Older children were dieted, but as soon as any amelioration appeared, they were allowed bouillon and soup.

It is very difficult to lay down general rules in therapeutics; nevertheless if it be allowed to us to point out a plan of treatment for the pneumonia of children, we would recommend the following:

1. In a pneumonia supervening upon a chronic affection, and assuming itself the character of a chronic disease, no active medication should be directed against it, but an attempt made to modify the general health. Particular attention should therefore be paid to hygienic precautions, avoiding the continued decubitus of the child upon the back—prescribing the most absolute cleanliness, &c. As general treatment we would advise the use of light tonics internally—and, above all, (the appetite still remaining in most cases,) we would prescribe fortifying and nutritive aliment, in a small compass. The diarrhœa is not to serve as counter-indication, for the diarrhœa of children by no means always depends upon an inflammation of the digestive tube: most generally it is dependent upon a softening of the mucous membrane, which has more analogy with anæmia than inflammation. As a tonic externally, the sulphur bath might be prescribed, from which M. Jadelot thinks he has obtained some success.

2. If the pneumonia be present as complicative of a pre-existing disease, we would not have recourse to the subtraction of blood of which we have already demonstrated the want of success—we should prefer the treatment by the tartar emetic, since in a certain number of cases recovery has followed its employment. We should not fear to carry this remedy to a very high dose proportionate to the intensity of the inflammation, and despite any slight contra-indications on the part of the intestinal canal.

3. And finally, if the pneumonia were idiopathic, we would employ the combination of bleeding and the tartar emetic: we would however, not carry the loss of blood to any great extent, always proportioning it to the gravity and extent of the inflammation.

OBSERVATIONS AND TABLES.

We at first intended to append at the end of our work the greater part of the observations, which have served for its basis: but this project we have abandoned, as giving to our little undertaking a volume too considerable. We have prefered to give only facts sufficient to prove the principal assertions we have thus far advanced. Thus, there will be found, in the following pages, examples of the different forms, which the pneumonia assumes, of the two periods observed in it, of the different alterations of the respiratory sound, of the numerous lesions of the pulmonary parenchyma, &c. &c. If we have not quoted an example of idiopathic pneumonia in children from five to fifteen years of age, it is because the periodical collections abound with cases of this nature, and we are desirous of pointing out only facts the least known.

At the end of our observations, we have placed two tables of the pathological anatomy, representing the comparative frequence of the different forms of the pneumonia, as well as of the different other lesions of the lung, which most usually complicate the inflammation of the parenchyma.

OBSERVATION I.

Child æt. three years. Constitution not strong. Acute pneumonia. Two well marked periods. Treatment by the tartar emetic. Effect upon the pulse and respiration. Amelioration of the local state on the seventh day. Final convalescence the twelfth. Disappearance of all râle the twenty-fifth day.

Vaillant (Eliza) æt. three years, has been under treatment for more than a month in the ward St. Genevieve, for a diffused chronic eczema of the trunk. Ten days before entrance into the acute ward, she had commenced to cough, but her catarrh was so slight, as not to oblige her to take to her bed. Oct. 12, she was suddenly attacked with fever and increase of cough. The 13th, she was brought to No. 2, ward St. Anne, where we saw her at 3 P. M., in the following state:—

Constitution not strong; remains of the eczema on various parts of the body; chest well formed. Decubitus dorsal, eyes closed, cheeks coloured, skin burning, pulse 160, full and regular. Inspirations 64, *without dilatation of the alæ nasi:* the child is remarkably somnolent. *In front*, on both sides, the respiration is

ril 5

strong and pure. *Behind* pure, in the whole of the left side and the summit of the right; but in the middle part of the right side it is obscure, and below, in two fingers' breadth, bronchial—the bronchial character is especially marked in the slight cry that accompanies the expiration. The resonance on percussion is diminished at the right base; it is normal in the left. The cough is rare, without expectoration; the tongue is quite moist, with a slightly white coat: abdomen distended and tympanitic: no stool since entrance.

Prescription.—Sweetened infusion of mallows for drink.

Take of Tilleul[1] water, ʒiv.
Syrup of poppies, ʒiij.
Tart. ant. and potass. gr. iij.
Syrup, ʒj.

This prescription, given by spoonfuls, determined no vomiting, but three or four loose dejections, and it was all taken on the 14th, at three P. M. Up to this time the febrile symptoms continued unabated; pulse 160, respiration 64. The hepatisation appears to have advanced. The percussion is flat in a greater extent than yesterday; the respiration is obscure on the right in the two inferior thirds: in a strong inspiration, a bronchial respiration is heard in various scattered points of the inferior third. The skin is excessively hot. The prescription is continued, with an increase of the tartar emetic by one grain. The next day, (the 4th,) three quarters had been taken at noon without vomiting. The skin is less warm than yesterday; pulse 144, respiration 36. The child opens her eyes, commences to speak, and asks to sit up in bed; the tendency to somnolence has disappeared. This amelioration of the general symptoms, however, is unaccompanied by any proportionate change in the physical signs, as the respiration continues clearly and distinctly bronchial in the two lower thirds of the right lung, with flatness in the same space, and a subcrepitous râle at the summit. The same prescription is continued; the tolerance is perfect, and the 16th the child's state is stationary. The 17th, the child has now taken in all fifteen grains of the tartar emetic, without any vomiting; the pulse is 120, the respiration 36. The bronchial respiration is present in the whole of the right lower lobe, and at intervals, after cough, there are heard some *explosions* of crepitous râle *excessively fine*. To-day the tartar emetic is omitted, being replaced by a julap of poppies. The 18th, at seven A. M. the child is in a peaceful slumber; pulse 120, respiration 40, equal. The bronchial respiration ceases to be heard, except at the inferior angle of the scapula; below this point, after cough, there exists the crepitous râle, excessively fine. 19th, pulse 126, respiration 28; same physical signs. 20th, pulse 116, respiration 28; the bron-

[1] Tilleul is the Tilia Europea: no corresponding preparation is found in the American Pharmacopœia. Its real nature is unimportant, being merely used as a pleasant vehicle.—*P.*

chial respiration has entirely disappeared, together with the râle, only the respiration is accompanied by a sonorous râle posteriorly and inferiorly on the right, and the percussion is a little less resonant than in the correspondent parts of the left lung.

23d. All trace of the flatness has disappeared; pulse 104, but there exists posteriorly a somewhat abundant subcrepitous râle. This râle persisted until the 5th of November; but the convalescence may be considered as established on the 23d of October.

Remarks.—This observation is a fine example of acute pneumonia in a child of three years. With the exception of the expectoration, there existed the greater part of the symptoms of the adult—acceleration of the pulse and respiration, the stethoscopic signs, and flatness on percussion. The two periods which we have signalised in the pneumonia of children, from two to four years, are here well defined. Our young patient had coughed for ten days, but this slight apyretic catarrh did not prevent his running about all the day in the wards; when suddenly and simultaneously there supervened the acceleration of the pulse and the respiration, which marked the transition to the second period. Thirty hours after the commencement of the disease, the bronchial respiration had already manifested itself, but in a limited space. After this it was heard from the base to the summit of the lung, and followed the same course as in the adult. In this case, therefore, we have, very probably, had to do with a pneumonia of the lobar form. The bronchial respiration offers the character common to that of children, viz. especially marked in the expiration. The tartar emetic appears here to have had a manifest influence upon the pulse and respiration. The fourth day, after the administration of six grains, the pulse was diminished by 16, and the respiration by 28. The sixth day, fifteen grains had been taken, and the pulse was still further diminished by 24; and, finally, on the seventh day we establish a manifest amelioration of the local state, and on the ninth the bronchial respiration had entirely disappeared. Our patient might be regarded as cured on the twelfth day of the disease, although it was not till the twenty-fifth that the last traces of the râles had disappeared.

OBSERVATION II.

Child of two years.—Generalised lobular pneumonia on the left, with a pleuritic effusion.—Simple lobular pneumonia on the right.—Two well-marked periods.—Duration of the catarrhal period one month.—Of the inflammatory five days.—Access of suffocation, with the supposed appearance of the pleuritic effusion.

Aliot, (Irma,) æt. two years, entered 24th November, 1824, the Hospital of Enfans Malades, and was placed No. 2, ward Saint Anne.

The persons who brought her, stated her to have been sick three weeks, with anorexy, a slight diarrhœa, and cough. Submitted to

our observation November 25th, we found the following: Constitution feeble, skin delicate, eyes black; impetigo of the hairy scalp. The dentition is not complete, the canines of the lower jaw are still wanting; the child is always with her fingers in her mouth, as if suffering with her teeth; countenance natural; skin not hot; respiration 28, pulse 112. Percussion every where resonant. Behind and before there is heard a combination of the sonorous and large mucous râles; the cough is rare; the expectoration nothing. Tongue moist, abdomen a little distended, but indolent; no diarrhœa.

Until November 30th, the state of the child remained the same. Auscultation, practised every day, gave nothing but the same râles, and there were no symptoms of reaction. The 30th, in the morning, the pulse was found accelerated as well as the respiration; pulse 160, vibrating; 52 inspirations. Persistence of the same râles on both sides posteriorly, but more especially on the left. Percussion less resonant at the left than right base.

December 1. Skin hot, pulse trembling, 180; respiration 60, unequal, with dilatation of alæ nasi. Posteriorly, in the two inferior thirds of the left lung, bronchial respiration, with percussion still less resonant than yesterday; on the right, persistence of the mucous râles, with diminution of the resonance, (julap of poppies, ʒij.)

Dec. 2. Pulse 164, still small and trembling; respiration 60, irregular. The respiratory murmur is not sensibly modified since yesterday; however, the mucous and sonorous râles, heard in the right back, are replaced by a subcrepitous râle in the expiration: the inspiration is rude at the summit, (tartar emetic, gr. iv.; dry cupping on the left side.) At four P. M. the child was found attacked with an access of suffocation, the face purple, the oppression extreme, and death appeared imminent.

On the morning of the 3d, our young patient was, however, still alive; pulse and inspirations as yesterday; countenance pale, skin of the body moderately warm, of the extremities cold. The bronchial respiration has extended to nearly the whole of the left back. The flatness on percussion is *complete;* on the right, at the level of subspinal fossa, very distinct *resonance of the cry*, without any bronchial respiration; inspiration rude, subcrepitous râle in the expiration, percussion resonant. The cough has ceased; three quarters of the potion already taken have produced no vomiting, but two or three loose dejections. In the course of the day the condition of the patient continued to aggravate, and he succumbed the 4th of December at midnight.

Autopsy thirty-four hours after death—weather fine and dry.

Externally.—Body well formed; no cadaveric stiffness; no vibices.

Head.—Calvaria strongly adherent to the dura mater; arachnoid smooth, transparent. Considerable quantity of serosity in the

subarachnoid tissue; cerebral veins injected; the brain, except a somewhat excessive quantity of the bloody points upon incision, is in the normal state.

Neck.—Larynx and trachea healthy.

Chest.—The right lung presents at the base some loose cellular adhesions. The left pleura contains a glassful of purulent serosity, and is covered with false membranes, soft, yellowish, and of about an eighth of a line in thickness.

The right lung is supple, rose coloured in its greater part, but in its middle posterior third, (base of the superior, and summit of the inferior lobe,) it is violet coloured externally, and an incision reveals the presence of a considerable number of scattered points of a variable size, where the tissue of the lung is red, friable, and sinking when placed in water,*(lobular pneumonia.) The rest of the lung is healthy, except the summit, which contains a tubercle the size of a small nut. The bronchi of this lung contain a spumous liquid, and are a little red, without, however, any alteration of texture.

Left lung.—The upper lobe is supple, rose coloured, containing neither tubercles, nor points of hepatisation; the lower lobe violet coloured externally, marbled red and gray in an incision which is smooth, friable, granulated upon tearing, not floating upon the surface of water, either in separate pieces or in totality. This alteration occupies the whole lobe, and no single lobule remains unaffected in the midst of the general disease. The bronchi of this lobe are of rather a vivid red; not dilated.

The pericardium contains no serosity. The heart, carefully measured, is of normal dimensions; the auricles contain numerous yellowish coagula.

The abdominal organs, examined with the minutest care, present no appreciable alteration, except a slight injection of ten or twelve of the patches of Payer, without softening.

Remarks.—We find, also, in this observation our two periods of the disease well marked. After a catarrh of about a month's duration, the symptoms of which we were enabled to appreciate, the disease commenced by a rapid acceleration of the pulse and respiration, and what is very remarkable, the percussion revealed to us the signs of a pneumonia before the auscultation had thrown any light upon the affection. The access of suffocation, taking place thirty hours before death, appears to us to have coincided with the effusion. In probable proof of which, there is, on the one hand, the increase of the dulness, which, from being only relative, became complete; and, on the other, the lung was not found flattened against the spine, as if the pneumonia had been anterior to the pleuritic effusion. We must not forget, also, the resonance of the cry, the subcrepitous râle, and the rudeness of the respiration, which put us upon the diagnosis of a lobular pneumonia of the right side, which was confirmed by the autopsy. And, finally, we remark, in the left lung a well characterised generalised lobular

pneumonia, a tissue *marbled* with gray and red, the rapidity of the hepatisation having almost destroyed any isolated hepatised lobules; the lobules of disease which we met in the right lung are sufficient to justify this idea.

OBSERVATION III.

Child of eighteen months. Lobular pneumonia slightly generalised, supervening on a chronic enteritis. Absence of constitutional symptoms nearly complete. Death in the last degree of marasmus. At the autopsy, a generalised lobular pneumonia of the right, simple lobular of the left lung. Dilatation of the bronchi.

Haering, æt. eighteen months, was brought to the hospital, October 9, 1838. Born of healthy parents, she was put to nurse immediately, where she remained till the age of eleven months, when she was returned in perfect health. Two months before her entrance at the hospital she was attacked with diarrhœa and vomiting. Admitted into the wards in the middle of September, she went out after a short stay, but returned in October for the same complaints.

October 10, she was in the following state:—

Eyes blue, hair blond, constitution feeble, dentition incomplete, the canines wanting. Countenance natural, sitting up in bed. The cheeks are cool and moist, the extremities cold and purple; 40 unequal inspirations, pulse with difficulty counted. The respiration is perfectly pure, and the percussion resonant in front and behind; the thirst extreme, the tongue moist; the surface of the abdomen purple, tense, resonant, indolent; abundant yellowish diarrhœa; appetite still preserved. No cerebral symptoms. Until the 2d of November there appeared no change, except a constant and great emaciation. The diarrhœa is as abundant, and the respiration remains perfectly pure; (the auscultation was daily.)

November 2. In the right back the respiration is a little more feeble than in the corresponding parts on the other side; here and there are heard some slight cracklings; no symptoms of constitutional reaction.

Nov. 5. On the right back, large, moist, and mucous râles at the summit; below, respiration obscure, and percussion a little less resonant at the base than on the opposite side. Pulse 140, skin slightly warm, no dilatation of alæ nasi; for the first time a slight cough. From the 5th to the 10th no change.

Nov. 10. The cough is increased, the pulse insensible, respiration 52; at the right base, for the width of two fingers, bronchial respiration in the little dry expiration succeeding the inspiration; above, respiration strong; on the left, expiration exaggerated; the percussion is not resonant at the right base.

Nov. 13. Pulse still insensible, respiration 32, without dilatation of alæ nasi; in the whole right back moist subcrepitous râle, resonance of the cry at the base; on the left, sonorous râle;

same state of the percussion. The face is yet paler than before; the emaciation extreme; abdomen and limbs are covered with ecchymoses, and the extremities œdematous; diarrhœa still persists; the cough is rare, and only when the child is made to sit up.

Nov. 14. Pulse still insensible; pulsations of heart distinct, 120; respirations 32; in front, the respiratory murmur is strong and pure; on the right back subcrepitous râle very moist in the inspiration; bronchial expiration; dulness in the inferior quarter, increasing as we approach the base.

Nov. 15. The skin is warm; pulse can be counted, 144, very small, respiration 36, without dilatation of alæ nasi; on the right back persistence of the same physical signs; on the left, the subcrepitous râle is heard throughout; diarrhœa still colliquative; paleness and emaciation extreme.

16th. In the morning same state, and death supervened in the evening.

The treatment consisted of julaps of poppies, and a few grains of diascordium;[1] the pernitrate of iron (gutt. vi.) was exhibited for the diarrhœa; on the 11th, also, a blister was applied to the right back; and the appetite being partly preserved, the child took milk and bouillon.

Autopsy thirty-eight hours after death—weather cold and damp.

Last degree of marasmus; numerous ecchymoses upon trunk and extremities.

Arachnoid healthy, with considerable serous effusion underneath; pia mater not injected; three or four spoonfuls of serosity in the ventricles; brain normal.

Larynx, *trachea*, and *bronchi* are but just tinged with red.

The pleuræ, smooth and polished, contain neither false membrane nor serosity.

Right lung.—At the anterior part of the superior lobe there are seen some projecting, pulmonary lobules; the vesicles are visible to the naked eye, and there are also visible some considerable bubbles of air in the interlobular cellular tissue. At the summit, behind, a space, the size of a small egg, the parenchyma is red, friable, and does not float upon water; an incision gives issue to a yellowish purulent liquid, perfectly analogous to what is evolved in the bronchi, and which escapes from the little cavities formed by their dilatation. The lower lobe is purple externally, upon incision it is a red colour marbled with gray; is friable, and sinks in water; in many points there are small cavities anologous to those of the upper lobe; the scissors penetrate easily into the interior, on incising the bronchi, the mucous membrane of which appears con-

[1] Diascordium is an electuary comprising a great quantity of ingredients of tonic, with some sedative properties.—*P.*

tinuous with that uniting the above cavities; the bronchi of this lobe are of a vivid red, and contain a yellowish purulent liquid.

Left lung.—Upper lobe perfectly healthy; lower lobe is purple in its posterior and inferior third; an incision reveals the existence of a considerable number of points, varying from the size of a pea to that of a filbert, red and friable, (lobular pneumonia;) the bronchi of this part are slightly reddened but not dilated, containing a moderate quantity of spumous liquid. The remainder of the lobe is healthy.

The pericardium enclosed a spoonful of serosity; the tissue of the heart is of good consistence; the auricles contain some gelatinous coagula.

Abdomen.—The mucous membrane of the stomach is thin and softened in the great curvature.

The mucous membrane of the small intestine is remarkably white, giving no strips, and its tenacity is extreme.

The large intestine is of a vivid red in various points: its mucous membrane is softened in the red points, and offers a considerable number of dilated, follicular orifices.

The liver is pale, yellowish, and greases the knife; the spleen and kidneys are normal; no tubercles any where.

Remarks.—We find, in this observation, a type of that variety of pneumonia which assumes the aspect of chronic disease. As the pulmonary inflammation commenced under our eyes, we had the opportunity of following it in all its phases, and appreciating its duration. It is in a case like this, we have to felicitate ourselves for our daily and exact auscultation of all our young patients, without which precaution the half of our pneumonias would have escaped us. The symptoms of reaction were nearly inappreciable; the acceleration of the respiration, however, and the results of the auscultation have clearly indicated the progressive increase of the disease. The extreme *moisture* of the subcrepitous râle had made us suspect a dilatation of the bronchi, and the autopsy confirmed our supposition.

OBSERVATION IV.

Child of four years. Measles followed by chronic enteritis. Marginal and lobular pneumonia. Dilatation of the bronchi. Complete absence of reaction. Paucity of the auscultating signs explained by the pathological anatomy.

Perrin, (Clemence,) æt. four years, entered September 20, and was placed No. 11, ward St. Anne.

This young patient, of delicate constitution, subject to diarrhœa and eruptions upon the hairy scalp, entered for the first time in September: she was then convalescent of measles, of which the marks were still present. At this time we discovered, although there existed a cough, the respiration to be pure and the percussion

resonant. She left the hospital the 14th, to enter again the 20th, attacked with a diarrhœa which had existed since her departure.

Sept. 21, she was as follows:—Hair chestnut, eyes blue, face pale, emaciation advanced, constitution delicate; countenance natural, lips pale, skin not hot; pulse 96, respiration 32; percussion resonant before and behind; respiratory murmur perfectly pure; pulsations of the heart regular, strong, distinct, and heard in the whole of both backs. A little cough, no expectoration, tongue moist, a little grayish; appetite still present; abdomen supple; no œdema of extremities; no cerebral symptoms.

Oct. 5. The child complained of pains around the umbilicus, and some inequalities were felt in the abdomen at this spot. The following days the cough augmented, and there were heard some mucous cracklings, especially at the left base, which afterwards disappeared, leaving the respiration pure. The cough, however, persisted; and, Oct. 7, there were heard some bubbles of mucous râle in the right back: but not only were there no symptioms of reaction, but the pulse was below the standard; pulse 64; the hands are cold; the face extremely pale; the extremities œdematous, and the diarrhœa persists.

Nov. 3. Same general state. Percussion every where resonant; the respiratory murmur is more rude at the right than the left side, but without râle. The pulse is nearly insensible; still a little cough.

From the 3d to the 6th November, the day of death, our patient continued in much the same state, with the diarrhœa still colliquative: despite of which, however, the appetite was still preserved.

Nov. 4. There are observed some aphthæ upon the tongue and lips; the pulse continuing insensible, the respiration not accelerated, the feebleness too great to allow the patient to sit up for auscultation, and she died Nov. 6, at seven P. M.

Autopsy thirty-six hours after death—weather cold and dry.

No cadaveric stiffness; last degree of marasmus; œdema of extremities.

Head.—Fontanella half ossified; arachnoid smooth, transparent; no glands of Pacchioni; considerable subarachnoid infiltration of serosity; the cerebral veins contain no blood; the cerebral substance pale, of good consistence, containing three or four spoonfuls of serosity in the ventricles.

Neck.—Larynx healthy; trachea and bronchi contain a large quantity of purulent liquid, but their mucous membrane is healthy.

Chest.—The pleuræ are smooth, polished, and contain neither false membrane nor serosity.

Right lung.—The middle, or small tongue-like portion of the lower, and the lower part of the superior lobes, are purple externally—penetrable by the finger, upon incision *very finely granulated.* Pressure causes to exude from the affected parts an infinity of small drops of a liquid like that in the bronchi, whitish, not

spumous, and lodged in the little cavities formed by the dilatation of the bronchi, which is so great that their extremities are double in diameter the parent bronchus. The mucous membrane of the bronchi receives its coloration from the subjacent tissues. In the remaining lobes, which appear healthy externally, an incision reveals a large number of indurated points, where the pulmonary tissue is red and friable, (lobular pneumonia.) Their volume varies from a filbert to the head of a large pin. Finally, in a large number of points, and especially along the anterior border, the pulmonary tissue is projecting, and presents a kind of thickening, where the pulmonary vesicles are clearly distinguished, greater in volume than in other parts of the lung.

Left lung.—The tongue-like portion which is in front of the heart, and the part of the lung lying upon the diaphragm, in about an inch of the elevation, present an alteration of the parenchyma and bronchi similar to that of the right lung. At the summit of the inferior lobe there is a cavity capable of containing a large filbert, having its external wall formed by the pleura, and a communication with a single bronchus, whose mucous membrane appears to be continued into its interior. The liquid contained in this cavity is white, not spumous, analogous to that in the smaller bronchi. The remainder of the parenchyma is healthy, with the exception of some scattered points of lobular pneumonia.

Neither the lungs nor the bronchial glands contain any trace of tubercles.

The pericardium encloses a spoonful of serosity: the heart has its ordinary volume; the valves are pale, with some coagula in the auricles.

Stomach.—Mucous membrane rose coloured in the great curvature; gives no strips at this part.

Small intestine.—Mucous membrane pale, very thin, affording, however, strips of two or three lines.

Large intestine.—In the last foot the mucous membrane is thickened, red, softened, &c.

The mesenteric glands are tuberculous, and many of them softened.

The other abdominal organs present no appreciable alteration.

No active remedies were employed against the pneumonia; the diarrhœa was merely combated by enemata of starch and poppies.

Remarks.—Here is another very remarkable example of those pneumonias of a chronic form, which constitute our first variety. In this case the pneumonia was not generalised, and the symptoms of reaction were entirely wanting. As to the auscultation, it gave only negative results, in spite of the existence of the bronchial dilatation. But the absence of many of the physical signs may easily be explained by the nature of the lesions found at the autopsy: 1. The absence of the bronchial respiration is very well explained by the slight extent of the pneumonia: if, however, the auscultation had been as constantly practised in front as behind, we should have

probably detected it on the level of the middle lobe: 2. The absence of râle, in the last days, is as easily conceivable, upon reflection that the purulent fluid filling the bronchi was not penetrated by air.

If the explanation of the absence of certain signs is easy, it is no less so to account for those in reality present. Thus, the roughness of the respiratory murmur in the right back is naturally explained by the existence of the numerous points of lobular pneumonia which the autopsy revealed.

OBSERVATION V.

Child of three years. Lobular pneumonia appearing at the same time with an imperfectly marked measles, in the course of a chronic enteritis. Pneumonia becoming slowly general. Resolution still more slow. Last degree of emaciation. Death imminent. Amelioration six weeks after the commencement. Final recovery. No active treatment.

Brerige, æt. three years, was brought to the hospital September 12, and placed No. 9, ward St. Anne. Very little information as to her previous health; but we learned that three weeks before, she was attacked with fever, cough, and an eruption of red spots over the whole body, (measles.) Since, she had suffered with diarrhœa and œdema of the extremities.

Sept. 13th. Constitution frail and delicate; hair blond, scanty; eyes blue, impetiginous scabs upon the lips; upper and lower extremities cold and purple, with a sensible œdema; abdomen full, but no fluctuation; pulse regular, 112, inspirations 22; in both backs percussion resonant, and respiration perfectly pure; same in front; pulsations of the heart not loud, but distinct; tongue moist; diarrhœa abundant, like *beaten eggs;* thirst great; the child is very plaintive.

From Sept. 13th to Nov. 8th, the diarrhœa remained the same; the emaciation advanced rapidly, but the œdema disappeared almost entirely. The respiration during all this time remained perfectly pure, and the percussion resonant. Auscultation had been practised every day.

Nov. 8th. There supervened three or four vomitings, without any symptoms of reaction.

9th. the skin is hot; pulse 160, respirations 44, without dilatation of the alæ nasi; slight cough for the first time since entrance; in the whole of right back subcrepitous râle, with inspiration and expiration; on the left the respiration is strong and pure; percussion every where resonant; on the thighs, legs, and abdomen there exist little red irregular papules of the size of the head of a pin, disappearing under pressure; no trace of eruption in the rest of the body; diarrhœa still abundant.

10th. The eruption has faded, having been confined to the lower half of the body. The pulse is imperceptible; respirations 30; the

warmth of the skin has disappeared; in the right back subcrepitous râle; in the left some rare crackles.

11th. The eruption has disappeared; pulse 130, respirations 36; same phenomena of auscultation.

12th. No change.

13th. Skin warm; pulse 128, respirations 40; in the whole right back a subcrepitous râle heard at intervals; no vesicular expansion at the base; percussion less resonant relatively to the opposite side.

14th. Skin warm; pulse 156, respirations 48, elevating the whole thorax, not anxious; slight dilatation of the alæ nasi; in the whole right back subcrepitous râle, in the lower third with bronchial expiration; percussion but slightly resonant at the right base; respiration pure on the left side.

Until November 25th, there appeared no change, except a continued increase of the emaciation. The face is extremely pale, the diarrhœa persists, the symptoms of reaction have disappeared; the same subcrepitous râle, dulness, and bronchial expiration in the right back—but the abundance of the râle frequently overpowers the bronchial sound.

From Nov. 29 until Dec. 20, the child was examined every day, and each examination gave very nearly the same results, the subcrepitous râle in the right back, dulness in percussion at the base, but without the bronchial expiration. The emaciation is at the last degree.

Dec. 20. There exists a little amelioration; our patient very cross and plaintive hitherto; has become more pleasant; she is seated in the bed; the countenance is a little better; the pulse is 116; the appetite has returned; the râle persists, but the dulness no longer exists.

From Dec. 20 till Jan. 15, the amelioration continually progressed. The appetite is good, despite the diarrhœa, the tongue moist, the emaciation commences to disappear and the strength to return. The râle, however, persisted until Feb. 5, when it entirely disappeared. The amelioration was not interrupted during the remainder of the stay at the hospital.

No active treatment was directed against the pneumonia; some slight astringents for the diarrhœa (syrup of ratanhia,) some enemata containing a small quantity of laudanum, as well as some julaps containing syrup of poppies ʒiij, were likewise exhibited. For two days gr. xij. of the white oxide of antimony were added to the potion of gum. The diet was at no time rigid, as our patient preserved her appetite throughout the disease.

Remarks.—This observation merits a very particular attention in consequence of the termination of the disease. The pneumonia appears under the most unfavourable circumstances at a time when the child was reduced to the last degree of emaciation—and yet recovery followed. But for the final resolution of the pulmonary engorgement, how long were we obliged to wait! The eruption,

occurring at the same time as the pneumonia, appeared to have more the characters of a simple erythema (erythema simplex) than of the measles. This opinion is confirmed by the fact that the patient had already been attacked by the eruptive fever, which rarely appears twice in the same individual. The form of the pneumonia places it in our first species; the concomitant eruption, whatever its character, appeared to impart to the disease symptoms of more than usual reaction; an acceleration both of the pulse and respiration decidedly marked the commencement of the disease. The results of the auscultation deserve careful meditation, as this single history furnishes several examples of the different transformations of the respiratory murmur.

OBSERVATION VI.

Lobular pneumonia supervening in good health, in a child of two years, accompanied with cerebral symptoms.

Sinet, (Pierre-Victor,) æt. 2 years, No. 8, ward St. Thomas, entered Nov. 11, and died in the night of the 17th and 18th.

This child, born at the full term in perfect health, has, however, never continued in the enjoyment of it. A few days after birth, he was attacked with a purulent ophthalmia, to which succeeded an impetigo of the hairy scalp, followed by frequently repeated colds. These different affections so retarded his developement, that at present he walks with difficulty, speaks but a few words, and dentition has commenced only within five months, at which time he had slight convulsions and a diarrhœa lasting some days.

Nov. 3, being in tolerable health, he was attacked with a violent cough attended with fever: on the morrow, during twenty-four hours, he had convulsions lasting from ten minutes to half an hour, and returning about every hour; attacking the limbs, face, and eyes. The cough and fever have persisted since, and the child has remained pale, bloated, somnolent, without appetite or diarrhœa.

Nov. 12. Patient lying on back, face slightly coloured on the left side, the alæ nasi dilate considerably, the skin is slightly warm, the left foot is, however, a little colder than the right, and the contrary is evident with regard to the hands. Pulse small, frequent, 146 to 150.

The oppression is considerable. Respiration 76 to 80, irregular, sometimes less, sometimes more in number. The resonance on percussion and the respiratory murmur are every where good. Lips dry, tongue moist, gums a little swelled and red, the incisors are hardly projecting. Abdomen somewhat large, full of gas, but supple and not painful; no diarrhœa. (Infusion of mallows with honey, calomel gr. vi. emollient enema. Bouillon.)

13. Fever and agitation all night—calomel has produced no dejections (same prescription except the calomel.)

14. Night as the former—cough a little hoarse and strong—no

diarrhœa. The face is pale, lips dry and encrusted; the patient is very irritable, crying whenever he is touched and hardly allowing an examination. 50 irregular inspirations, difficult, with a hard noisy and painful expiration. Impossible to count the pulse. Auscultation is almost impracticable, nevertheless, despite the cries, we thought we heard a mucous râle on the right side. (Same prescription, calomel gr. vi. laxative enemata.)

15. Some agitation throughout the night, day somnolent, his sleep is tolerably tranquil, permitting us to count 30 irregular inspirations and 114 small pulsations. As soon as he is awakened, he becomes immediately very irritable, and only a superficial examination can be made. Our patient is bloated, with his eyes encrusted, as also the nose and lips. Abdomen tense and painful; one dejection after the calomel; a slight cough still continues. (Infusion of mallows with honey. Magnesia gr. 12. Emollient enema. Bouillon.)

17. Slight stiffness of the upper extremities: the fingers are bent upon the hand and the hand upon the wrist; they can be straightened but not without causing pain; the feet are slightly flexed; the sensibility is preserved but slightly diminished equally on both sides; pupils dilated but movable. The head is quite movable; these symptoms were not noticed by the attendants prior to the visit.

The face presents sudden alternations of pallor and redness, the oppression is extreme; the dilatation of the alæ nasi considerable. There are still the accesses of irritability, even when not touched. Consciousness is still present, and drinks are swallowed with avidity. (Mallows, syrup of gum; magnesia, and calomel, aa. gr. iv. demi emollient enema. Bouillon.)

During the day our patient had well marked convulsions in all the limbs for about half an hour. At the evening visit he is more tranquil. Pulse 148, respiration 58, unequal. The head is drawn backward, but without stiffness; pupils less dilated; the limbs are the same as in the morning; sensibility the same; skin hot with momentary perspirations.

Our patient remained in this tranquil state, in full consciousness, and asking frequently for drink until the middle of the night, when he was again taken with convulsions lasting for a short time, and he died quietly about 5 o'clock.

Autopsy thirty hours after death—weather mild and slightly moist.

The body loaded with fat, presents a slight swelling of the extremities, which have remained flexed as during life. The thorax presents modosities at the union of the cartilages and ribs.

Brain.—Cranium very voluminous and its walls are very thick in various points, and thin in others; the anterior fontanelle is not ossified. Dura-mater very adherent to the bone but appears healthy. The arachnoid smooth, transparent, presents a few of Pacchioni's glands. In the pia mater there is an abundant serous infiltration, without any granulations, or traces of inflammation. The simuses

contain numerous coagula, some coloured, others discoloured: the central veins are slightly congested.

The consistence of the cerebral substance is every where good. The cortical portion is slightly rose-coloured, the medullary is only slightly marked with bloody points upon incision. Ventricles contain three to four spoonfuls of transparent serosity; their walls are healthy.

The spinal marrow presents no alteration in colour or consistence. There is only remarked rather an abundance of sub-arachnoid fluid, and an infiltration, more considerable than usual, between the bones and dura-mater.

Thorax.—The right pleura has some recent adhesions, which are soft, gelatinous, and infiltrated with a yellow coloured serum. The lung of the same side does not collapse upon the opening of the chest.

The whole of the superior lobe hepatised in the second and third degrees, is gorged with a great quantity of a sanious grayish liquid. At its external and middle portion there is a little cavity of the size of a filbert, filled with sanguinolent fluid, not communicating with the bronchi.

The middle and lower lobes are hepatised in the second degree, nearly throughout, but especially behind and in the upper part: the tissue is dense red, smooth upon incision, granulated upon tearing, and easily penetrable by the finger. The anterior part of the base alone remains unaffected and floats upon the surface of water. The healthy portions present some vesicles more voluminous than the others, apparently emphysematous.

The small bronchi appear reddened from the colour of the subjacent tissues, and containing liquid mucus, not bloody.

The left lung and pleura are perfectly healthy, and contain but very little liquid.

The larynx and the large bronchi are healthy.

There are no tubercles in any of the thoracic organs.

The heart without any alteration, and of good consistence, contains numerous coagula in all its cavities.

Abdomen.—The mucous membrane of the digestive tube presents no notable alteration. Throughout its whole extent it furnishes strips of five and six lines, except at the great curvature of the stomach, where the strips are only two or three lines. The colour is a gray rose, and at intervals there is an injection, but limited in extent.

The other abdominal organs are in the same heathy state.

Remarks.—This observation is an example of pneumonia accompanied with cerebral symptoms; we observe at the first view, that the thoracic disease has not been entirely masked by the phenomena of cerebral reaction. The first symptom was cough, with an oppression, which was always considerable, and these two symptoms have persisted until death, although they diminished in intensity, and presented very considerable variations at different

times. The auscultation was never properly practised; we are sure, however, that six days before the death the respiration appeared pure, and nevertheless we found the hepatisation advanced to the third degree.

It is impossible to believe that so considerable a hepatisation, should not be revealed by auscultation if properly practised; we must only think that there are pneumonias, which, by sympathy reacting upon the brain, give rise to cerebral symptoms, which, absorbing the attention of the observer, mask the symptoms of the thoracic affection.

In the present case, the cerebral symptoms showed themselves at the beginning and end of the disease and are analogous to those described by M. Tonnelier, in a memoir in the *Gazette Médicale*. The author of this memoir asserts that this assemblage of cerebral symptoms exists in children, without any lesion of the nervous centres, but of different thoracic or abdominal organs.

Finally, to conclude, we must notice the form of the hepatisation, which is lobar, and occupied only one lung, a fact in direct opposition with the opinion of Dr. Gerhard, who affirms, in children from two to five years, pneumonia to be always double and lobular in its form. This case, moreover, is not the only one, which contradicts the assertion of the American pathologist.[1]

OBSERVATION VII.

Measles. Lobular pneumonia generalised in the second and third stages. Mucous râle. Masking for a long time the bronchial respiration. White softening of the mucous membrane of the large intestine.

Delaforte (Théophila Alexandre), æt. two years and a half, was brought to No. 2, ward St. Thomas, without any other information than that he had had the measles six weeks previously and had been sick ever since.

Upon entrance Nov. 30, we saw him in the following state: complexion blond, skin fine and pale a little rough and scaly upon the extremities, giving the sensation of a dry heat, the face is anemic, infiltrated, colour of wax, the nasal line is very pronounced, the eyes are encrusted, the lips dry, sticking together and pale. The alæ nasi dilate considerably immediately preceding the inspirations, the pulse is small and frequent, impossible to count from the patient's restlessness.

On opening the mouth there are found only the incisors and one molar; the gums are neither red, nor swollen, and do not appear painful; the tongue is moist and pale; the abdomen is large and soft, although filled with gas, without any tumour; the liver however projects a little below the ribs. Pressure especially upon the right side appears painful, augments the nasal line and causes a knitting of the eyebrows. Dejections frequent, loose and yellow.

[1] See the table of Pathological Anatomy.

The cough is moist, not frequent; the chest resounds moderately well in its whole extent; every where except in the left part and axilla, there is heard a large abundant mucous râle in both the expiration and inspiration, more abundant at the summit than the base of the lung. It is fine and subcrepitous in the front of right base, (white decoction,[1] julep with oxide of antimony ʒss. syrup of poppies ℥ss. demi emollient enema: bouillon.)

Dec. 1. At first sight our patient appears moribund, he is so pale, feeble, and nearly motionless. The symptoms, however, are the same as yesterday, except a slight forward movement of the lower jaw. The cough is less abundant, the râles still persist. (Same prescription.)

Dec. 2. Same general aspect. Our patient utters at moments a singular plaintive cry. Behind, the râle is the more abundant at the right base; there is a bronchial expiration in the sub-spinal fossa and here the percussion is dull. Persistence of the diarrhœa —pulse small, frequent, cannot be counted—(oxide of antimony, ʒj.) Death in the evening of this day.

Autopsy forty-four hours after death—weather cold and dry.

Chest.—The pleuræ present old adhesions posteriorly.

Right lung.—Deep red externally, especially posteriorly; voluminous, not collapsing. Its superior lobe upon incision resembling the liver, is of a yellowish gray and red; upon scraping it furnishes a sanguinolent, sanious liquid; upon tearing, it appears granulated, and the finger penetrates without difficulty. This lobe sinks in totality to the bottom of water.

The inferior lobe presents the same characters, with a redder colour, but only in the posterior portion. It floats only by the anterior portion of its base, which however presents some points of hepatisation. The middle lobe, equally hard and large, presents some points of hepatisation, and floats in totality. The nodules of separate engorgement, small in number, vary in size from a pea to a filbert.

The mucous membrane of the smaller bronchi transmits the colour of the subjacent tissues: where the bronchi are sufficiently large to furnish strips, there is neither thickening nor softening. They contain also a tolerable quantity of mucus.

Left lung.—Externally marbled gray and red, but in general the colour is not deep—it floats in totality and in parts, except a very small portion of the base which is hepatised. It contains rather an abundant quantity of a spumous liquid, and is a little less resistant than a healthy lung.

The small bronchi of this lung are redder than those of the other, owing to the more vivid redness of the subjacent tissues; the mucus is also abundant.

The bronchial glands are small and but slightly developed;

[1] Principally mucilaginous.—*Tr.*

there are no where any tubercles. The trachea and the large bronchi are of a grayish red and perfectly healthy.

Abdomen.—Mucous membrane of stomach and small intestines of a normal colour and thickness, giving strips of from three to five lines. The patches of Peyer red and somewhat developed are neither softened nor ulcerated.

The large intestine is gravely affected: throughout its whole length, the mucous membrane of a pale white is very thin and does not give strips in any of its parts. This intestine is filled with a yellow mucous substance, in large quantity. The mesenteric glands are small, numerous, not softened.

The other abdominal organs are normal.

Brain.—No alteration save a somewhat considerable subarachnoid infiltration. The ventricles contain four to five spoonfuls of serosity, without softening of the walls. The cortical substance is slightly rosy, and the medullary presents no bloody points.

Remarks.—This is an observation of lobular pneumonia generalised, agreeing entirely with our description of the passage of this pneumonia to the third degree.

It shows that in young children, and in this kind of pneumonia especially, the abundance of the râle may mark the pathognomonic signs of the pneumonia itself.

The general state of the patient and the concomitant lesion of the large intestine permit us to rank this case in our first category; it must be, however, regretted that the previous history of our patient was so incomplete, as well as the succession of symptoms from the commencement.

OBSERVATION VIII.

General and capillary bronchitis. Mamelonated and partial pneumonia. Hepatisation and carnification, with dilatation of the bronchi.

Fariol, (Jules,) æt. five years, entered ward St. John No. 6, December 22, 1837, and died January 5, 1838.

We have had but few details of the previous history of this patient, as his parents had him at home only a month before his entrance.

At that time he coughed much, had a catching pain in the right side, but only at the moment of the cough: he was slightly bloated, had a violent fever, especially at evening, without any diarrhœa. Since that time, persistence of the fever and cough, which has recurred in paroxysms, with blowing inspirations, followed by an abundant serous expectoration, and even vomiting. The pain in the side disappeared, to return again; the oppression was always considerable: the appetite was preserved, however, and there was no diarrhœa.

Present state, (Dec. 23.) Eyes and hair brown; skin white and delicate; face a little bloated, especially the upper lip, which is

pale and encrusted; the nasal line is very pronounced; the alæ nasi are widely dilated a little before each inspiration. The skin is moist and warm; pulse 136, rather small. The tongue is moist and clean; the abdomen supple, a little tumid, not painful; two semi-liquid dejections since yesterday. Respiration difficult, but regular, 56; the cough manifests itself in paroxysms of hooping, lasting several minutes. In *front*, percussion gives a good resonance on both sides; on the right there is heard a very loud sonorous râle both in the inspiration and expiration. At the top of the lung, in addition, there is a prolonged expiration; on the left, the same sonorous râle exists during the inspiration only, while the expiration is very rough and hard, especially at the summit. *Behind*, the resonance is good and equal on the two sides: every where there is heard in the inspiration a mucous, mingled with a sibilant râle. In the two interscapular spaces, but especially in the left, there is heard a well-marked bronchial expiration. Very abundant sero-mucous expectoration. (Mallows, infusion, looch, with oxide of antimony 3j.; syrup of cinchona ℥j.; soup.)

Dec. 24. General condition much the same; pulse 140; respiration 60; skin of hands warm and moist, of the body dry and burning. Behind, the physical signs remain the same. In front, the sonorous is replaced by a mucous râle on both sides. (Same prescription, oxide of antimony, 3ij., milk.)

25th. Has had a slight sleep in spite of an abundant diarrhœa. Lips are now a little less swollen; the bloated appearance has diminished; the dilatation of the alæ nasi is less; there are no facial lines, and almost no heat of the skin; pulse 130, respiration 50, nearly entirely abdominal. Physical signs nearly the same, except the mucous râle, which is, perhaps, less abundant, and at the middle of the right side it is more dry and crepitous. The expiration in the interscapular space is still heard. (Same prescription.)

27th. Skin dry and warm; pulse only 120, soft, full, and regular; the diarrhœa has ceased; same results from auscultation. (Same prescription; oxide of antimony, 3iij.)

28th. The swelling of the nose and lips has reappeared, with the bloating of the face, and the nasal line. The countenance is pale, indicating prostration; skin hot and dry; pulse 144, soft, tolerably large: respiration 44; tongue moist, rosy coloured, and trembling; abdomen, although supple, is tympanitic, and generally painful; there is an abundant yellow diarrhœa. The chest is sonorous; the mucous râle, always very abundant, masks a little the bronchial expiration. Expectoration the same. (Same prescription; oxide of antimony, ℥ss.; semi-enema of flaxseed and poppies.)

29th. The general condition was considerably aggravated; pulse 146, small; respiration 56; abdomen continues painful, and the diarrhœa persists. The mucous râle is heard throughout the chest more abundant than ever; the bronchial expiration has disappeared.

From this time the state of the patient continued to aggravate, with delirium constant up to the moment of death. From his obstinacy in scratching his nose it was covered with bloody scabs, and the cheeks became of a violet red. Death, however, did not arrive till the night of Jan. 4. During these six days, the collapse and feebleness prevented all careful auscultation: the mucous râle was always heard quite abundant; and, in the latter days of life, there was added the tracheal.

Autopsy thirty-six hours after death—weather cold and damp.

The body is thin, without stiffness, and presents a slight putrefaction of the abdominal parietes.

Thorax.—The mucous membrane of the trachea and large bronchi display fine points of a rather vivid redness, and even appear softened. The right pleura offers solid adhesions, with some false membranes, which are soft, vascular, and strown with little tubercular granulations. The lung is heavy, and marbled red and violet in separate lobules, and floats in totality; upon incision, a part of the lobules appear of a clear red, containing air and a sanguinolent serosity: others, of a deeper colour, are hepatised, breaking up under the pressure of the finger, and are surrounded by little collections of miliary tubercles. These collections are scattered through the three lobes, but in small quantities; the same lung contains also lobules of hepatisation, perfectly isolated one from the other, which sink in water, and yield, upon pressure, a sanious fluid not containing air.

At the anterior portion of the middle lobe there is found a portion of tissue, the size of a nut, collapsed, flaccid, externally of a livid red, internally a little less deeply so; hard and resistant to the pressure of the finger, and sinking when thrown into water. The bronchi of this part preserve the same calibre from their arrival in this tissue until they reach the surface of the lung; some even are a little dilated; they contain an abundant puriform fluid, and their mucous membrane, after being washed, is too much softened to permit of the making of strips.

The smaller bronchi of the other parts of the lung are not dilated, but are generally reddened, although the subjacent tissue is not uniformly so; they contain an abundant quantity of mucus filled with air.

The left pleura offers some weak adhesions: the lung of this side presents externally clearly marked lobules of a violet colour, projecting and solid under the finger: upon incision, these portions appear hepatised and congested, and there issues an abundant serospumous fluid, which is in some parts sanious, and contains air. The hepatised lobules, being well isolated, sink to the bottom of water, but considerable attention is necessary to obtain this result, they are so enveloped by, and insensibly confounded with the simply engorged tissue. These lobules of hepatisation are nume-

rous, and exist equally in the two lobes. At the anterior portion of the lower lobe there is found a portion of hepatisation the size of a filbert, presenting, upon incision, little cavities, the size of a lentil, communicating with each other by dilated bronchi, and filled with a puriform liquid; they are lined by a smooth thin membrane, apparently continuous with that of the bronchi.

The small bronchi of the other parts are like those of the opposite side. In this lung there are no tubercles.

The bronchial glands, voluminous on both sides, are tuberculous on the right; red, soft, and without tubercles in the left.

All the cavities of the heart contain coagula, both coloured and the contrary, with a slight quantity of liquid serous blood. The border of the mitral valve is a little red and thickened; the heart's volume is not increased.

Abdomen.—No abdominal organ presents any notable alteration: the mucous membrane of the intestines is every where of a good consistence, and furnishes strips of five and six lines. The colour is generally pale, except some arborescent deep redness scattered in a small extent over the large intestine.

The liver, of the usual size, and containing the usual quantity of blood, offers a great number of gray demi-transparent granulations in the interior of its tissue and under the serous membrane.

The spleen contains one crude tubercle of the size of a hemp seed.

Brain.—Arachnoid smooth, transparent, offering however a slight opacity about the glands of Pachioni, which are very numerous; the ventricles contain but little fluid. The cerebral substance is every where of good consistence and colour.

Remarks.—This observation is of great interest from the nature of the anatomical lesions, as well as from the results of the auscultation. We find united here examples—1. Of *mamelonated* pneumonia, that is, lobular pneumonia perfectly circumscribed, without any tendency to attack the neighbouring portions. 2. Of partial pneumonia, that is, of lobular pneumonia, with a tendency to the surrounding tissue. 3. Of limited carnification and hepatisation surrounding our two species of bronchial dilatation. 4. Of a general and capillary bronchitis, proved at the autopsy. All these lesions were consequent upon the hooping cough.

As for the symptoms from the auscultation, we should remark that the separate nodules of hepatisation gave a bronchial expiration, which, at the end of the disease, was masked by the mucous râle, the result of the constant accumulation of mucus, the consequence, without doubt, of the feebleness of the child.

OBSERVATION IX.

Vesicular bronchitis. Simple lobular pneumonia. Dilatation of the bronchi. Bronchial expiration masked by the mucous râle.

Androit, (Edmund,) æt. nine years, entered Dec. 19, 1837, died Jan. 2, 1838.

This boy, of a naturally good constitution and health, was attacked with measles about eight days before his arrival at the hospital,—the eruption having, by report, gone through all its periods; the fever and the cough continued, with epistaxis, diarrhœa, nausea, pain in the abdomen, and sore throat.

Upon entrance, patient very well developed, not emaciated, is nevertheless considerably prostrated. The face, livid in spots, is covered with an abundant furfuraceous desquamation; the alæ nasi dilate a little, and the edges of the nostrils are surrounded with red scabs, in consequence of a slight epistaxis; the lips are dry, not encrusted, and there is no facial line. The skin is slightly warm and dry; pulse 114, large and soft; no cephalalgy; the tongue is moist, loaded at the base, red at the tip, and there are some white patches upon the upper and lower gums. The patient complains of a slight pain in the region of the larynx; the tonsils are a little red and swollen. The abdomen, generally painful, is a little less so at the umbilicus, and is soft, supple, without gurgling, rose spots, or eruption, but covered with some furfuraceous scabs. Last night there was a bilious vomiting, and numerous liquid dejections.

The respiration is regular, 48; the cough moist, frequent, and still preserving the character peculiar to measles: the expectoration is sero-mucous: decubitus upon the back, but possible upon either side. The form of the chest is good, without emaciation, or an excessive quantity of flesh. In *front* the resonance is good on both sides; on the right there is heard a mucous râle occupying the whole side, more abundant, drier, and finer in the middle region, ordinarily heard during both times of the respiration, but sometimes in the expiration only: on the left, the mucous râle is less abundant, and sometimes is entirely absent. *Behind*, the resonance is moderate, but equal in both sides; in the right, subcrepitous râle nearly to the summit, but more especially at the base: at the summit there is united with it a little prolonged expiration. The râle exists in the inspiration, and at times there is a sibilant râle in the expiration. On the left the respiration is strong and rude, with an expiration at the summit, and a slight mucous râle in the whole height of the chest.

(Mallows, syrup of gum, looch with kermes, gr. ij.; semi-emollient enema, sinapisms, bouillon.)

Dec. 21. The prostration and fever are greater; persistence of the vomiting and diarrhœa; the chest is in the same state. (Same prescription; kermes, gr. iv.)

Decem. 22. Slight epistaxis; the face is more purpled, and asphyxia appears imminent; the prostration is more considerable; pulse still 144, but less full, respiration 50: tongue a little pointed, red at the tip, white at the base; profuse yellow diarrhœa: other symptoms the same.

The auscultation gives nearly the same results as before, with only the following differences: Subcrepitous râle in the whole right back, but finer and drier in different points: there is a little expiration at the summit, where the râle is less: on the left, the râle is still less at the summit, where is a considerable bronchial expiration; below there is an abundant mucous rale. (Same prescription; kermes, gr. v.)

Dec. 23. The colour of the face is more vivid; the prostration is less, there has been a slight epistaxis; the nose continues red, and covered with scabs: the lips are dry, the tongue white and moist, the abdomen is not painful; only one dejection since yesterday; has taken soup with a relish. Persistence of the febrile reaction and prostration.

The auscultation continues the same in front, except that the mucous rale has become subcrepitous in nearly the whole extent, instead of merely in the middle portion. On both backs, abundant subcrepitous rale throughout, with strong bronchial respiration at the left summit, and a slight expiration at the right, in the same point. (Same prescription; kermes, gr. vi.)

Dec. 24. Agitation throughout night; prostration this morning. The sore throat and diarrhœa have returned. Otherwise, persistence of the same symptoms; desquamation of cuticle continues; (same prescription, kermes gr. vii.)

Dec. 25. Sleeplessness, agitation, and diarrhœa throughout night. The eyelids are red and encrusted, there is a slight nasal trait, and the alæ nasi dilate considerably. The face is coloured, especially the left side. The lips are dry, tongue moist, and yellow at the base; continual pain in the situation of the larynx, which does not however embarrass deglutition. The abdomen, slightly tense and tympanitic, is painful in the epigastrium and right iliac fossa. Pulse 120, regular, with heat and dryness of the skin. The oppression continues the same; same cough, same expectoration.

In the whole of both backs, there is heard a mucous râle, during both inspiration and expiration; the bronchial expiration has disappeared. In front, same mucous râle, equally strong on both sides. (Mallows, syrup of gum, looch, kermes gr. viij. syrup of poppies, ℥ss. semi-emollient enema, bouillon.)

Dec. 27. Prostration extreme, heat of skin. Pulse small, 130. The cheeks are livid in spots, the nose is encrusted, bleeding, same physical signs, only the râle is perhaps a little more fine and subcrepitous on the right. The face presents two or three vesicles of varioloid, none on any other part of the body. (Same prescription, kermes gr. xi.)

From this time till the day of death on the morning of the second

of January, (five days after,) our patient's state was continually worse and worse, prostration extreme, hardly allowing the sitting position necessary for the auscultation, which gave always the same result, mucous or subcrepitous râle wherever possible to place the ear; the skin was dry, except during the two or three latter days, when it was bathed in copious perspirations; the countenance by degrees lost entirely its expression, the patient could with difficulty articulate; the pulse was augmented to 160, preserving the same smallness, and the inspirations to 60; the abdomen continued painful, and there was an abundant, frothy, yellow diarrhœa.

The same treatment was pursued in carrying the kermes as high as fifteen grains.

Autopsy thirty-three hours after death—weather moist and warm.

The body presents no stiffness, vibices, nor any trace of putrefaction.

Thorax.—The right pleura presents some redness and arborescent vessels without any adhesions.

The right lung heavy, but flaccid and crepitating, collapsing but little, red posteriorly, of a gray rose colour in front, is gorged with a quantity of sero-sanguinolent liquid, and penetrated with air. The incised surface, of a gray rose colour, presents the projection of the bronchi filled with mucus, together with a number of small yellow granulations projecting from the surface, about the size of millet seed and filled with the same mucus; the tissue of the lung is more friable than normal, but it still floats upon the surface of water.

The anterior portion of the middle lobe presents some engorged nodules, red, hepatised, easily torn and sinking in water; they are well isolated from the surrounding tissue, which is rose coloured and have a size from that of a lentil to a large pea.

The small bronchi are red, filled with mucus, and are either augmented, or preserve the same size from their origin to the surface; their mucous membrane does not appear softened; they are also dilated in all the points where the granulations exist, that is to say, in nearly all their extent, especially posteriorly.

The left pleura red, and containing some arborescent vessels, presents posteriorly some gelatinous, soft, and recent adhesions.

The left lung is of a deeper red, swimming in its totality upon the surface of water, presenting red, projecting spots, scattered unequally over its surface. The incision is marbled with a violet and a clearer shade of red; the lobules are well defined, and separated by their colour and projection from the healthy tissue; the deeper coloured ones, which are the more projecting, are granulated upon being torn, easily penetrated by the finger and sink in water. The lower lobe presents the same disposition; the hepatised points however are smaller and more numerous; one of them has suppurated with the formation of a small abscess, which does not however

communicate with the bronchi. These latter are redder than on the other lung, but contain less liquid, and are not dilated.

The large bronchi and the larynx, slightly red, contain a small quantity of liquid mucus penetrated by air.

The bronchial glands are red, voluminous and softened. There are no tubercles any where.

There is nothing remarkable in the heart or large vessels.

Abdomen.—The stomach contains mucus and some of the kermes. The mucous membrane is of a vivid red, in large bands in the smaller curvature, elsewhere in small lines and points with occasional small ecchymoses; its thickness appears great, especially towards the cardiac orifice and the great curvature. Its consistence is variable in points close to each other; the strips are sometimes from one to two lines, or from half an inch to an inch, indiscriminately in the parts which are reddened as in those which are not so, in the great curvature as in the smaller.

The small intestines present no notable alteration; the mucous membrane with a few arborescent vessels at the upper portion is gray and pale in the greater part of its extent, its thickness is good, and gives strips from three to five lines; in the duodenum the strips are only from two to three lines.

At the lower portion there are some reticular patches, similar to a newly shaved beard, but neither tumid nor ulcerated.

The large intestines are generally healthy, with a good colour and consistence of the mucous membrane; the rectum, however, presents some vivid red spots, where the mucous membrane breaks under the forceps, giving strips of from two to three lines only.

The mesenteric glands are slightly reddened, but not softened.

The other abdominal organs perfectly normal, are all, however, except the spleen, gorged with a considerable quantity of blood.

Brain.—Arachnoid, smooth and transparent nearly throughout, is a little dry, and presents along the grand fissure as well as at the vermiform process, a considerable quantity of the glands of Pachioni, surrounded with a slight opacity of the membrane.

There is no sub-arachnoid infiltration, but all the small vessels of the pia mater are distended with blood, and there are even some small ecchymoses, which the scalpel moved over the surface does not push before it.

The cerebral veins and the sinuses contain much blood. The cortical substance presents a little redness, and the medullary a considerable number of bloody points. The consistence is every where good, and the ventricles contain from one to two spoonfuls of serosity.

This observation is important as proving the truth of many of our ideas already emitted. We find first a well marked simple lobular pneumonia, in a child more than six years of age; we see besides an abscess of the lung, a vesicular pneumonia and dilatation of the bronchi. The first of these four lesions is so perfectly distinct from the others, that the symptoms appertaining to each

may be perfectly appreciated. And finally we observe a commencement of pleurisy with simple lobular pneumonia.

The whole of this disease has been developed after a measles, the desquamation of which we have been able to see.

The lobular pneumonia was manifested by the characters which we have attributed to it. In the right front, a drier and finer râle, surrounded by one coarser and more moist, which finally entirely prevailed over the former; on the left back, bronchial expiration at the summit, mucous or subcrepitous râle every where else, finishing by masking the parenchymatous element, in proportion as the strength of our patient declined.

We must now explain the existence of the same expiration at the summit of the right back, where the autopsy has not revealed the existence of a hepatisation; first, however, we must remark that perhaps there really did exist one of those lobular pneumonias at the third degree, which so easily escape detection at the autopsy, the existence of which may be expected here from the physical signs. Unless this be the case, why this remarkable discordance between the lesions? The tissue, more penetrable than usual, floats nevertheless in water, and its colour is a gray rose; if we had examined more closely, perhaps, we should have found the vesicular granulations surrounded by points of pneumonia at the third degree.

But even if this explanation be rejected, another may still be found in the dilatation of the bronchi: we know, in fact, from other observations, that this alteration may, in certain cases, produce the symptoms for which we are endeavouring to account. Finally, it must be noticed, that here, as in the other lung, the bronchial sound was marked by the mucous râles increasing with the accumulation of mucus in the bronchi.

The symptoms of hepatisation were manifested in the upper part of the lung, and only during the time when the mucous râle was least abundant, a fact which proves that a mucous râle may mask the bronchial respiration, almost immediately, or from one day to another.

We have spoken elsewhere of the result of treatment.

OBSERVATION X.

Generalised lobular pneumonia at the first and second degree. Dilatation of the bronchi into small cavities.

Fifrelin, (Joseph-François,) æt. 2 years, entered at No. 8, of the ward St. Thomas, the 29th and died the 31st of October.

His father, (a German) speaks no French. Any history therefore of the previous health or of the commencement of the present disease is entirely out of the question.

Oct. 30. This child, of a dark complexion, and very little developed, has so small a pulse as hardly to allow of its being counted.

There is, however, no febrile reaction, and the patient is cold and pale. The alæ nasi do not dilate, the respiration is oppressed, 40, unequal, with at times an appearance of stoppage and difficulty in the expiration, which is noisy and painful in the commencement. No cough.

Resonance of the chest every where good except in the two lower thirds of the left back, where it is diminished. Here is heard a very fine crepitous râle, very abundant, without any bronchial character. Same in the axilla of this side. Right back coarse mucous râle not abundant, existence of the same in the two fronts.

The lips are dry, encrusted and cracked; the tongue is moist and of a rose colour; the nose is encrusted; the abdomen is soft, flaccid, and does not appear painful; diarrhœa very slight.

Oct. 31. Our patient is moribund and will not permit an examination; no cough; 58 to 60 inspirations; same aspect as yesterday. The crepitous râle of the left side is more abundant, and very well marked. Mucous râle on the opposite side; diarrhœa slight; death the same day, two hours after this examination.

Autopsy twenty-eight hours after death—weather cold and damp.

Left pleura healthy.

Left lung, the lobules of which are very well marked, but the vesicles of which do not appear dilated, presents along its posterior border large and flattened bullæ, formed by the pleura solely, and having the appearance of interlobular emphysema. Upon incision of these there exude small drops of grayish mucus, *not containing air*, puriform, and issuing from little round cavities, the size of a lentil. These cavities communicate with the bronchi of which they are the continuation. Some exist at the surface of the lung and correspond to the bullæ already mentioned; others in the interior of the lobe are so closely situated as to form a species of cellular tissue being only separated in some cases by an imperfect partition: others are united by tubes of communication, apparently dilated bronchi, and which give off numerous branches, themselves dilated. All these are filled with the same fluid as the little cavities. Their mucus membrane, not thickened, but coloured red by the subjacent tissues, is smooth, polished and continuous with that lining the cavities. At the extremity of one of the bronchi there exists a tubercle, situated apparently in the very interior of the bronchus.

The surrounding pulmonary tissue is easily torn, and is generally red, some parts of it float upon the surface while others sink to the bottom, without any apparent difference of their physical qualities.

This description applies to the whole extent of the lower lobe. The upper lobe presents some projections due to the interlobular emphysema; there are none of the little cavities internally and the pulmonary tissue is slightly engorged.

The mucous membrane of the larger bronchi, of a slightly vivid red, possesses a good consistence.

The right pleura presents some rather finer and solid adhesions.

The right lung, generally crepitating, but slightly reddened, presents, in the middle of its inferior lobe, two nodules of hepatisation of the size of a filbert, in the middle of which are two cavities perfectly similar to those of the opposite side.

All the other small bronchi, not dilated, contain mucus perfectly penetrated by air.

The subject was taken from us before we could possibly examine the other organs.

Remarks.—Although this observation is doubly incomplete, from the want both of the anticedents of the history, and the remains of the autopsy, we cannot help inserting it from the importance of the details above mentioned. Besides every thing directly relating to the pneumonia is complete both in the pathological anatomy and auscultation.

We see here a remarkable example of our two kinds of bronchial dilatation, and which appear to be seated either in the course, or in the extremities of these tubes.

We can establish the difference between these cavities and the small pulmonary abscess. Around the bronchial dilatation there is found a lobular pneumonia on the point of becoming general, the hepatised portions being already united by an engorged tissue: the only difference between the portions of the left lower lobe lies in the circumstance that some of them float on the surface, while others sink to the bottom of water—in both cases there was the same colour, and the same friability: there existed here evidently a combination of points of pneumonia in the first and second degree. This opinion, moreover, is confirmed by the lobular pneumonia of the opposite lobe.

The symptoms are not less remarkable: we have, however, but a few words to say upon these, having already strongly insisted upon them in the course of the observation. This child, aged only two years, has presented a well-marked example of crepitous rale.

The existence of this rale appears somewhat contrary to the lesions which we have found after death, but we find a ready explanation in the fact that the bronchial mucus was not penetrated by air, and, therefore, could not give to the ear the sensation of bursting bubbles. In these circumstances the inflammation of the lung was manifested by physical signs, belonging to the degree of the disease.

OBSERVATION XI.

Lobular pneumonia after measles. Numerous abscesses of the lung. Double pleurisy.

Lefevre, (Antoine,) æt. four years, entered Oct. 2, No. 35, ward St. Jean. Mother healthy; the father, within three months, has considerably emaciated under a cough, hæmoptysis, and night sweats. Nursed by his mother, this child was weaned at four and a half months; has never had any cutaneous disease, nor swelling of the glands: first dentition was easy. Had the small-pox eighteen months, and the measles two months since: this last was followed by cough and expectoration; has been in bed for fifteen days, and has much emaciated; the appetite has been preserved, and there has never existed any complication of intestinal disorder.

Oct. 3. Hair blond, emaciation extreme, face pale and a little bloated, marked by the small-pox; skin hot and moist; pulse 120, small, with some softness: the tongue is clean, the abdomen simple, and not painful; thirst, some appetite, slight diarrhœa; oppression, slight dilatation of alæ nasi; 46 regular inspirations; cough slight, not abundant, loose; expectoration sero-mucous.

Behind, good resonance at the upper part of both chests, diminishing sensibly at the lower part, but descending a little lower at the right than left.

Behind, mucous râle in the whole of both lungs, existing in both times of the respiration—sometimes, however, in the expiration solely, intermingled with sibilant râle; bronchial respiration, especially in all the lower portion, and slightly in the interscapular space. On both sides, in front, resonance good and equal; coarse mucous râle, mingled with the sibilant, in the whole front chest.

(Mallows, syrup of gum, looch, oxide of antimony ʒj., semi-emollient enema; bouillon.)

Oct. 4. Pulse 150, respiration 50; no diarrhœa. The physical signs vary only as follows: Right back, no bronchial respiration, except in the middle portion; elsewhere, mucous râle more abundant at the base. In left front sibilant râle at the summit, mucous râle at the base: at the right summit respiration rude, with but little sibilant or mucous râle. (Same prescription: oxide of antimony, ʒiss.)

Oct. 5. Same state; (oxide, ʒij.)

Oct. 6. Sensible amelioration; pulse 120, respiration 44; subcrepitous râle small in quantity in both backs, a little more in the right; resonance and percussion good, and equal on both sides.

In front, a little mucous râle on both sides, especially at the base of the lungs.

Three liquid dejections; no abdominal pains; appetite. Same condition during two days. (Oxide of antimony, ʒj.; soup.)

Oct. 9. Prostration, diarrhœa, loss of appetite; pulse 150, small; respiration 48.

Right back, dulness on percussion in middle portion, with crepitous râle and bronchial respiration. Below, and to the outside, mucous and unequal crackling; at the summit, some mucous bubbles at intervals.

On the left side, less resonance on percussion at the base, extending round to the side. Rather large mucous rale, with a slight expiration at intervals.

This falling off, however, was not followed by any long-continued reaction. (White decoction, syrup of poppies, ℥ss.)

Oct. 12. Fever slight; pulse 96, respiration 34; tongue clean, diarrhœa less: the amelioration in the local symptoms, however, not great.

In the right back the resonance is returned in a slight degree, but there is still a persistence of the crepitous rale and the bronchial respiration: at the top of the same side there exists a slight prolonged expiration, with a rather abundant mucous rale after cough.

On the left, at the summit, the respiration is strong: at the base it is obscure, without rale; dulness on percussion the same. In front, respiration pure. (Oxide of antimony, ℥iss.)

Oct. 18. The disease has continued stationary up to this time: the diarrhœa is a little less, but the cough is increased; paleness and prostration: the flies commence to gather about the nose, eyes, and mouth; skin hot; pulse 150, with an intermitting stroke; respiration 56; oppressed, thirst excessive.

Continuance of the dulness on left back, from the angle of scapula downwards, with subcrepitous rale and bronchial respiration, under and to the outside of the angle of the scapula: at the summit, mucous rale at intervals.

On the right side, same state as before. In front, respiration pure on both sides.

Same prescription.

Oct. 19. Notable aggravation of local symptoms. On the left, the flatness extends to the top of interscapular region. In the whole extent of this there is bronchial respiration and subcrepitous rale: at the base the rale is drier and more crepitous: at the base of right back little resonance upon percussion, with subcrepitous rale and bronchial respiration. At the summit, mucous rale, both in the inspiration and expiration, disappearing after cough, whilst, on the contrary, all the other rales are augmented by it. In front, very abundant mucous rale throughout the right side, especially under the clavicle. (Oxide of antimony, ℥ij.)

Oct. 20. Severe pain under right nipple; and there are heard at this point explosions of a subcrepitous rale during both the inspiration and expiration. Further than this, same local conditions as yesterday; skin warm; prostration more considerable.

Oct. 21. The pain of the side has diminished. Behind, the dul-

ness continues, but there appears more respiratory sound, unless it may be that we hear a very distant bronchial respiration. At the summit some mucous bubbles.

Oct. 22. Oppression extreme, respiration 66, dilatation of alæ nasi considerable; pulse 150, small, hurried, a little irregular; thirst excessive.

The left side appears still a little painful. On this side, behind, under the axilla, and even in front, the dulness on percussion is considerable. The respiration is inaudible in the whole lower part; heard only at the summit behind, and there it is bronchial: persistence of the same symptoms in the right side.

Oct. 23. Death at 8, A. M.

Autopsy thirty-two hours after death—weather cold and moist.

Emaciation extreme, with flaccidity of the flesh; no stiffness, no vibices; putrefaction somewhat advanced upon the abdomen.

Chest.—The left pleura—filled with an immense quantity of a serous liquid, containing floating flocculent albumen, lined in some parts with soft and not thick false membranes—is in itself red and injected. The left lung, compressed upon the vertebral column, is red and solid, and sinks immediately in water. On incision it is smooth and red, and presents the projecting orifices of a number of bronchi. The texture, granular when torn, is easily penetrable by the finger, but rather less so than in the usual hepatisation, due, without doubt, to the compression by the effused liquid.

In its interior are discovered a great quantity of small cavities, varying in size from that of a hemp-seed to a large pea, and filled with pus, mixed with coagula of blood. Some of these cavities communicate with the bronchi, the opening of which are easily distinguishable. At the point where the bronchus opens into the cavity, the mucous membrane appears cut short off, and presents a visible solution of continuity, which may, in some instances, be demonstrated by the formation of strips. These bronchi, slightly reddened in fine points, and containing a little spumous mucus, do not appear dilated: a considerable number of these cavities do not communicate with the bronchi, but appear rather surrounded by them. These abscesses, so numerous that no attempt was made to count them, do not communicate one with another.

No tubercle any where in this lung.

The right pleura presents the same alterations as the left, except that it contains only a few spoonfuls of serosity.

The right lung, not solid like the left, floats in totality upon the surface of water. The finger, passed over its surface, detects small hard bodies, which answer to engorged portions of a deep red, of the same size and form as the abscesses of the opposite side. These portions are solid, and easily broken down under the finger: they sink also to the bottom of water, provided they be properly isolated from the surrounding tissues. Some of these points of pneumonia

are traversed by bronchi, which do not change their natural aspect. The bronchi generally exhibit a small number of red points in their mucous membrane, and are filled with a spumous mucus.

The surrounding tissue, red upon incision, abundantly gorged with blood and a spumous serosity, floats upon the surface of water, and does not break under the pressure of the finger.

A small part of the base of the inferior lobe is reddened, filled with a sanious fluid, breaks down under the finger, and sinks to the bottom of water; the remainder of this lobe, containing no hepatised portions, is merely much engorged.

No tubercles.

The bronchial glands, large, red, and softened, are not in the least tuberculous.

The heart, filled with coagula, some coloured and others the contrary, presents nothing but a hard and thickened adhesion of the aortic valves, which prevents their application against the aorta.

Abdomen.—The mucous membrane of the stomach, containing a few arborescent vessels, is, however, normal in its thickness, and affords strips of several lines.

The mucous membrane of the small intestines, of a gray rose colour, is healthy, and presents at its inferior portion some numerous reticulated patches, slightly thickened, but not softened.

The mucous membrane of the colon generally of a rosy red, slightly thickened, furnishes no strips.

The liver of a normal size is generally red, but the two substances are distinct.

The kidneys contain much blood, but are healthy. The bladder contains urine which is troubled and deposits a sediment.

The pancreas are red and gorged with blood.

The spleen, not congested is of its usual size.

The peritoneum is of a rose colour, the subperitoneal vessels are gorged with blood; in a word, all the abdominal organs except the spleen contain a considerable quantity of liquid black blood.

Brain.—The dura mater, very thick, is adherent at the anterior fontanelle which is ossified. The arachnoid slightly opaque along the longitudinal fissure, presents a large number of Pachioni's glands, disposed in groups: there are some of these also along the superior vermiform process. The cerebral veins are distended with blood and the superior longitudinal sinus contains a firm coagulum. The pia mater is infiltrated with a moderate quantity of serosity. The ventricles not dilated contain very little serum. The cerebral substance is generally soft. The fornix is sensibly softened as also the tubercular quadrigemina upon their surface, and the anterior peduncles. All these softened parts are white. The medullary substance presents but few red points, the cortical is generally rose coloured.

In no organ were there found any tubercles.

Remarks.—The first impression from the reading of this obser-

vation, is that our patient was attacked with a general tuberculisation; for it is precisely in similar circumstances that this lesion is found in children. We have already spoken of the diagnosis in a case of this kind. But instead of tubercles, we find a lesion much more remarkable for its rarity: viz. abscess of the lung. We have already spoken sufficiently of this termination of lobular pneumonia not to be obliged to return to it.

In this case the lobular pneumonia of the right side was manifested by the bronchial expiration at the summit of the lung, and this symptom was finally masked by the mucous râle. The alternations of abundance and rarity presented by this râle, explain the irregularity of the other physical signs; we must, however, admit the existence at one time of a more extensive pneumonia of the right side terminating in resolution; the bronchial respiration and the dulness upon percussion recognised at the commencement, the engorged state of the lung at the autopsy after the disappearance of these physical signs are proof of this. Finally, in this same right side there was developed a grave pleurisy, although there had only existed in this lung a lobular pneumonia.

PATHOLOGICAL ANATOMY.

FIRST TABLE.

Relative frequency of the different species of Pneumonia at the different ages. 43 autopsies.

Names of the disease.	Frequency.	Age.	Seat.	Degree.	Concomitant diseases of the lung, other than dilatation of bronchi.
Vesicular Bronchitis.	5	2 yrs. 1	Left lower lobe, 2		Capillary bronchitis, 1
		4 1-2 1	Right " " 1		Lobular pneumonia, 2d degree, 1
		5 1-2 1	Whole of a lung, 1		" " 3d degree, 1
		6 1-2 1	Both lungs, 1		Lobular pneumonia, 1
		9 1	— 5		Carnification, 1
					— 5
Simple lobular Pneumonia.	10	2 yrs. 1	Double, 7	1st and 2d degrees, 2	Vesicular bronchitis and emphysema, 1
		2 yrs. 4 mos. 1	Right lower lobe, 1	2d degree, 4	Vesicular bronchitis of a single side, the pneumonia being double, 1
		3 1	Left " " 1	2d and 3d, 1	Limited marginal carnification, 2
		4 2	Middle portion right lung, 1	3d degree, 1	Limited marginal pneumonia, 1
		4 1-2 2	— 10	3d degree with suppuration, 2	Tubercle occupying the middle lobe with a slight surrounding hepatisation of the side opposite the lobular pneumonia, 1
		5 1	In the cases where the pneumonia is not noted or double, there were nevertheless found some few points of lobular pneumonia in the opposite side.	— 10	Emphysema and bronchial dilatation, 1
		9 1			Tubercles, 1
		13 1			— 8
		10			
Generalised lobular Pneumonia.	14	1 1-2 yrs. 1	Double, 6	1st and 2d degrees, 1	Carnification, 2
		2 5	Left lower lobe, 3	2d degree, 10	Emphysema, 2
		2 1-2 1	Left mid. and post. third, 1	2d and 3d degrees, 2	Very bad tubercles, 2
		3 3	Right lung, 1	3d degree, 1	— 6
		3 1-2 2	Right lower lobe, 3	— 14	
		4 2	— 14	In two cases abscess of the lung.	
		14	In all these cases there existed points of lobular pneumonia in the opposite lung.		
Lobar Pneumonia.	14	1 yr. 8 mos. 1	Double, 4	1st and 2d degrees, 3	Vesicular bronchitis, 1
		2 2	Right lung, 1	2d degree, 7	Carnification, 4
		3 1-2 1	Right lung, esp. the top, 2	2d and 3d degrees, 2	Carnification, bronchial dilatation and tubercles, 1
		4 1	Right summit, 1	3d degree, 2	— Tuberculous infiltration, 1
		5 1	Lower portion of right middle lobe, 1	— 14	Tubercles, 3
		6 1	Left lower lobe, 4		— 10
		7 2	Left lower lobe hepatised; the right at the first stage only, 1		
		11 1	— 14		
		12 1			
		13 1			
		14 1			
		13			

PATHOLOGICAL ANATOMY.

SECOND TABLE.

Alterations of the lung and its dependencies frequently complicating the pneumonia. 43 autopsies.

Names of the diseases.	Frequency.	Age.		Seat.		Colour. Form.		Concomitant diseases of the lung.	
Carnification.	11	2 yrs.	3	Double portion of the lower lobes of both lungs,	1	The colour of this alteration is sometimes red and sometimes rose colour.		Lobar pneumonia,	5
		3	2					Generalised lobular pneumonia,	2
		5	3					Simple lobular,	2
		5 1-2	2	Marginal double,	2			Vesicular bronchitis,	1
		6	1	Right middle lobe,	4				10
			—	Lobular, right,	1				
		11		Marginal, right,	1			Ten cases of carnification were complicated by the above diseases: a last case was complicated by a pleuritic affection in one side only, although the pneumonia was double.	
				Root of left lung,	1				
				Left lower lobe,	—				
					11				
Dilatation of the Bronchi.	13	1 1-2 yrs.	1	Marginal, double,	2	Form of the dilatation.		Carnification,	5
		2	3	Right upper lobe,	3			Generalised lobular pneumonia,	4
		3	2	Right middle lobe,	1	Preservation of caliber,	3	Marginal pneumonia,	1
		4	2	Right lower lobe,	2	Insensible increase,	4	Lobar pneumonia,	1
		4 1-2	1	Root of right lung,	1	Sudden increase,	1	Vesicular bronchitis, emphysema, and lobular pneumonia,	1
		5	2	Ant. and inf. part of right base,	1	Increase of three small bronchi,	1		
		5 1-2	1			Dilatation of the bronchial extremities,	6	Emphysema,	1
		7	1	Right upper and lower lobes,	1			Tuberculous infiltration,	1
			—		—		—		—
			13	Left lower lobe,	2		15		14
					—	The cases are 15 instead of 13, as two of the subjects presented the alteration under a double form.		The cases are 14 instead of 13, as one subject presented the dilatation with hepatisation and carnification.	
					13				

Several very interesting consequences may be deduced from these tables:

1. Vesicular bronchitis does not exist in the simple state.

2. The lobular pneumonias free from all complication are very rare.

3. From eighteen months to five years the most frequent pneumonias are the simple and generalised lobular ones.

4. Under this form the pneumonia is always double; consequently it is the form of the disease rather than the age of the patient, which makes it double or simple. In proof of this, the lobular pneumonias which are far from rare between two and five years, ordinarily occupy only a single lung.

5. After the age of five years the lobular pneumonias are rare.

6. In the idiopathic pneumonias, the right lung is the most usually inflamed: it is not the same in pneumonias complicating other diseases.

7. The lobar hepatisations are more frequent in the lower lobes.

8. Carnification is a frequent lesion: we have never met with it after seven years. It exists rarely uncomplicated.

9. Bronchial dilatation is seldom met with after the age of five years. Very rare in the uncombined state. And is found indifferently in all parts of the lung.

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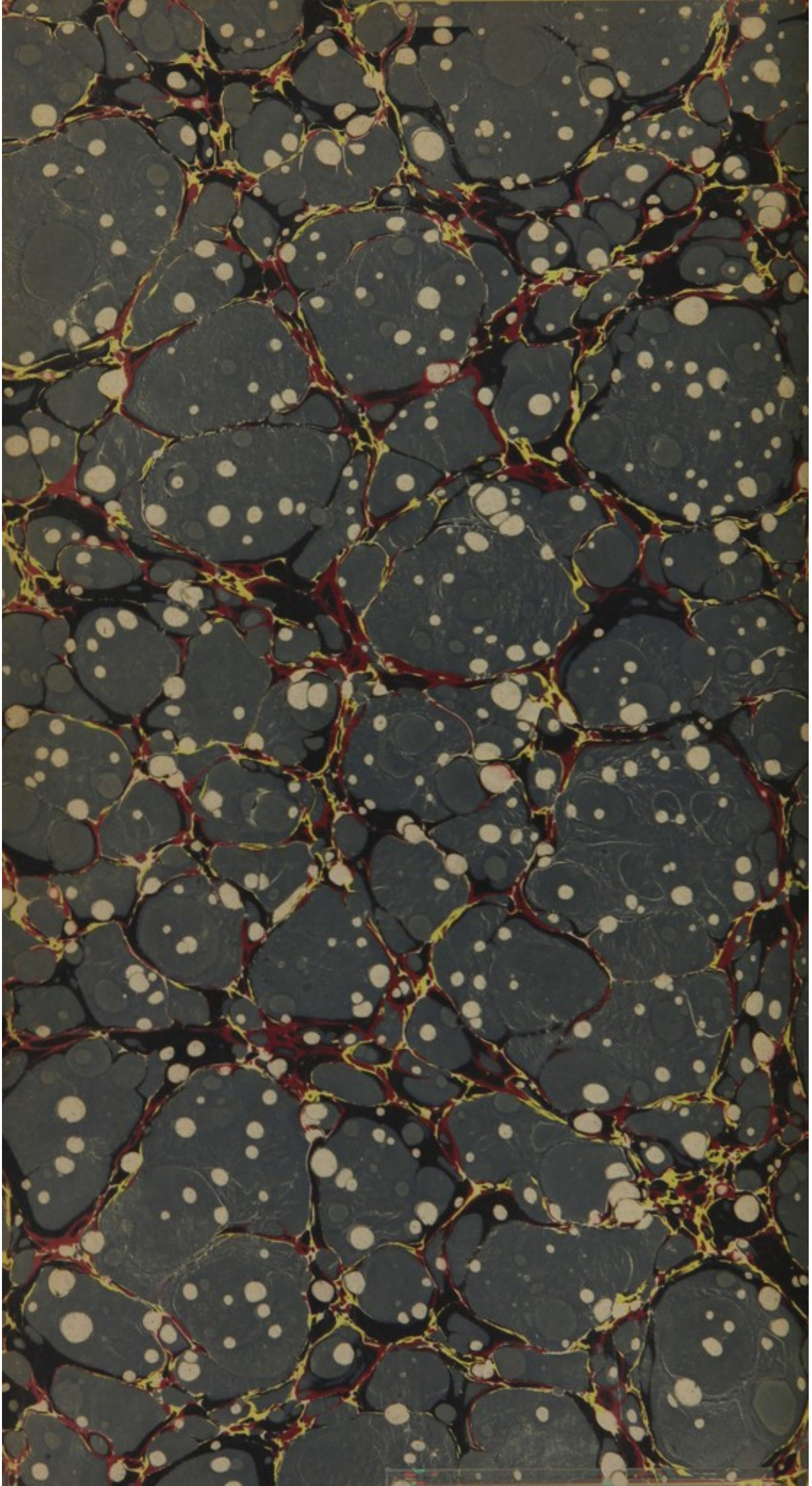


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