Clinical observations on pneumonia in children / by William Stephenson.

CLINICAL OBSERVATIONS

ON

PNEUMONIA IN CHILDREN.

BY

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CLINICAL OBSERVATIONS ON PNEUMONIA.

WHEN once a medical man becomes familiar with the thermometer in practice, he soon finds it an essential to his comfort, and feels as uneasy without it as did our fathers when their lancets were not in their pockets, or we ourselves are without our stethoscopes. Those however, who have not had the benefit of an hospital appointment, and, still more, who are largely engaged in practice, find some difficulty in studying the subject with that amount of fulness and detail which is essential to its thorough appreciation. Our systematic works do not yet fully reflect the subject in all its bearings, and in books on medical thermometry it is too much generalized, whilst the physician has to particularize, and feels the want of the comparison of the pulse and physical signs with the thermometric details before him.

For these reasons the following cases, selected from among those which have occurred in my practice at the Royal Hospital for Sick Children, may prove of interest to many. Although possessing no single feature which has not been observed before, they will illustrate some points which have not received that attention which they merit.

In the study of pneumonia, as well as other acute diseases, considerable advantage is to be found in taking the clinical chart as the true representative of the disease, and of higher value, both practically and scientifically, than the auscultatory signs or pathological products. The two never run counter; but in the light of the scientific precision and accuracy of record obtained by the former, the disease stands out in bolder relief and clearer outline during the lifetime of the patient than was possible before the introduction of the thermometer. By its aid we have an invaluable guide to diagnosis and treatment, and a surer test of the results of that treatment, than can be obtained from the physical signs alone.

Regarded in this light the latter become, in a great measure, merely the confirmatory evidence for the interpretation of the general state—the signature whereby the record is to be attested. But in all the acute febrile diseases it is with the amount and character of the pyrexial state which we, as physicians, have most to deal. It has been found that many have a definite and constant character, and we are thereby placed all the more independent of auscultatory evidence—a matter of no little importance where that may be for a considerable time latent or equivocal.

The diagnostic evidence so gained has a very special value in the diseases of children, from the peculiarities which the physiological characters of that age impart to the various affections classed under the term pneumonia. Considerable difficulty at times is found in

early determining the nature of the affection. This frequently arises from certain peculiarities which are more frequently met with in children than in adults. Those to which I would specially refer, as not having received a due amount of attention, are the following:—The greater frequency of cases where the physical signs remain latent for a longer period than is usual in adults; the occurrence of cases where the physical signs throughout are slight; and the greater frequency of the affection, attacking primarily and limited to the apex. These peculiarities are mentioned by writers, but only casually, whilst the frequency with which I have met them has given to them a greater importance to my mind, and has led me to suspect that many cases of pneumonia are overlooked or mistaken for simple febrile attacks.

The text-books, as yet, recognise only two forms of pneumonia as occurring in children—the primary, acute (croupous), or lobar, and the lobular (catarrhal) or broncho-pneumonia. The pathological differences between them are clearly stated, but they are still treated of too much together, whilst the principal clinical distinction lies in the secondary character of the lobular form, with a greater obscurity or uncertainty in the physical signs. The subject, however, has entered on a more advanced stage. Cases of acute primary pneumonia are resolving themselves into different types, when viewed in relation to temperature, pulse, and physical signs; catarrhal pneumonia has been recognised as a primary affection, unassociated with bronchitis; and cases complicating affections of the bronchi may be either broncho-pneumonia, or bronchitis with true lobar or croupous pneumonia.

Whilst so much foundation work remains to be laid in the differentiation, it is not to be wondered that the question of treatment should be in so unsettled a state as we find it. No true advance, moreover, is ever likely to be made so long as cases are aggregated together by the hundred, with only the one connecting link of the physical signs characteristic of the general term pneumonia.

At present I shall deal only with the class of the acute primary affection, leaving for subsequent papers the consideration of the other forms. The cases are selected to illustrate the points already referred to, while at the same time they show the relation of temperature and pulse as it bears upon prognosis and treatment.

The characters which mark the true acute pneumonia are—the immediate development of a high pyrexial state, which runs a pretty even course, showing but slight tendency to remission for five days, then declining slightly for one or more days, and terminating by a well-marked crisis.

When chest symptoms are present little difficulty of diagnosis is met with; but when unaccompanied by such, the diagnosis turns between it and fever of some kind, and mistakes in this direction I have found made from cases being sent to the hospital as fever. Scarlet fever is the only form in which the high pyrexial state is so immediately developed which is likely to raise a doubt, whilst the

absence of sore throat and non-appearance of the rash should soon remove it. In such cases—that is, where there is absence of cough, pain in the chest, or marked alteration in the respiration—there is one symptom to which experience has led me to attach much importance, and that is the presence of delirium during sleep. In children above two years of age I have never found it totally absent, since my attention has been specially directed towards it as a symptom in the class of cases I am speaking of; and on several occasions its presence has enabled me, by careful watching, to discover evidences of pneumonia of very limited extent. Its presence, moreover, at the onset, tends to negative the supposition of typhus or typhoid, as in these fevers it is a later symptom. I am fully aware that indigestion, or other trifling cause, will often make a child feverish and talk in his sleep, but I here speak of the delirium only as a symptom to place us on our guard, and in the absence of special indications to direct attention to the chest.

Whilst there may be an absence of *marked* alteration of respiration, a careful examination, especially of the naked chest, seldom fails to detect some *minute* change. The rate is quickened, but increased rapidity is common in children to pneumonia and the purely febrile state, but in the former it is more shallow, and later in the affection becomes more and more abdominal. In young children the audible respiratory character is of great importance. In Case V. there was observed a slight indrawing, with respiration, at the root of the neck, before the costal movements were arrested.

While watching such a case, with a temperature from 103° to 104° from the first day, and on the fifth to the seventh day a marked crisis occurs, I would certainly believe it to have been an acute inflammatory chest affection, even although I failed in detecting any physical signs, blaming my auscultatory powers rather than distrusting the evidence before me. Case V. illustrates how slight the physical signs may be, and I believe it is by no means rare for children to have a very limited amount of lung lesion, while the physical state is exceedingly well pronounced. In a case which occurred in private practice, where, from the character of the pyrexia and the presence of delirium, but without the slightest chest symptoms, I kept a strict watch over the whole chest, I found on the fifth day, limited to a spot in the upper right lung, in front, covered by the end of the stethoscope, distinct crepitation and bronchial breathing, without any change in percussion. Next day not a trace of lung lesion could be detected, whilst a marked crisis had occurred during the night. I need not remark how anonymous this febrile attack would have been had the signature not been thus appended.

Pneumonia, attacking primarily and limited to the apex, is much more frequent in children than in the adult. It is necessary, therefore, to auscultate this part as carefully as any other. My experience confirms that of others, that in this class the immediate high temperature and delirium is very pronounced. In Case III., which had been stated by a medical man to be fever, I expressed my opinion,

from the pungent heat of skin and marked delirium, that it would prove to be pneumonia of the apex, and admitted him accordingly to the general ward. In this class of cases the importance of the general clinical characters is enhanced by the fact that in them the physical signs are, as a rule, long latent (fifth day), and the affection often very limited. To this there is an exception, as I shall afterwards show, of an exceedingly fatal type, where, from the first, the consolidation of the lung is very great in degree. As a rule, well-marked delirium and high temperature, with absence of other indications, should always direct attention to the apex of the lungs, and a daily examination be made, otherwise the confirmatory evidence may escape notice. It should also be remembered that in young children convulsions may take the part of delirium.

CASE I.—*Pneumonia, left base—Physical signs on fifth day—Crisis at the end of sixth day, with exacerbation during seventh day.* (*See Chart.*)

Henry B., æt. 8, a well-nourished boy. Well till evening of 14th June, when he had shivering, pain in back and head. 15th, hot skin, great thirst and headache. 16th, admitted to hospital.

	Day of Illness.	T.	P.	R.	
June 16	II.—E.	104	136	48	Skin hot and dry; occasional short cough; rapid respirations; no pain anywhere; tongue coated, papillæ prominent; heart sounds, normal; nothing special in chest.
„ 17	III.—M. E.	103 104·4	132 134	40 44	Restless night, no delirium; slight headache; bowels moved; at right apex, respiratory murmur deficient, expiration prolonged, almost bronchial; no dulness.
„ 18	IV.—M. E.	103 104·6	128 138	44 44	Talked during sleep; face flushed; apex as yesterday; slight difference in percussion and respiration at the base, posteriorly, but not very definite; chlorides in urine diminished.
„ 19	V.—M E.	102 101·8	128 124	50 55	Dulness, tubular breathing, and increased vocal resonance at left base, more marked in the evening; anteriorly, nodulness; harsh breathing.
„ 20	VI.—M. E.	104·6 98·7	128 92	64 45	No marked change in physical signs; no moist sounds; slight frontal headache.
„ 21	VII.—M. 2 P.M. E.	97·7 103 98·8	98 ... 92	38 ... 44	Tubularity not quite so great; exacerbation of fever in the middle of day; evening better, a few moist râles below angle of scapula.
„ 22	VIII.—M. E.	98·5 99	75 88	32 35	Slept well; tongue cleaner; less dulness at base; very slight crepitation on deep inspiration; above spine of scapula, breathing slightly bronchial; expiration distinctly marked; no dulness; anteriorly, breathing harsh.
„ 23	IX.—M. E.	98·5 97·8	78 80	30 30	Râles at base more distinct; no other change.

f 24th.—Dulness now quite gone; moist râles, and slight increase of vocal resonance rom spine of scapula downwards; at the extreme base there is a marked decrease of vocal resonance.

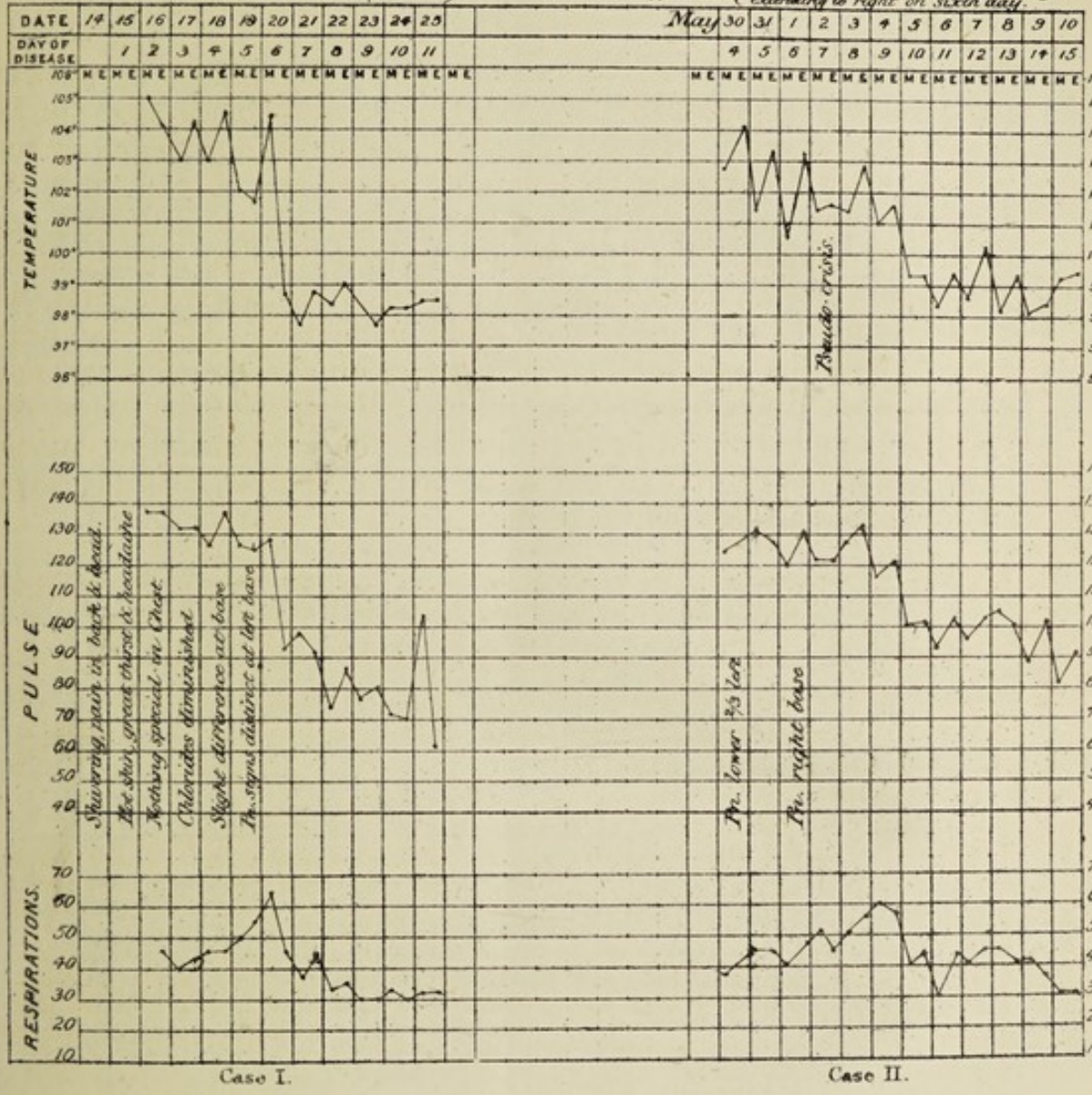
29th.—The lung has gradually cleared up, and this morning there was only slight harshness of breath sounds and increase of vocal resonance. Dismissed quite well.

June.

CLINICAL CHARTS OF CASES OF PNEUMONIA

Name - H.B. Disease - Pneumonia (low base).

C.M^c.G. Æt 6. Disease Pneumonia, lower two thirds left lung extending to right on sixth day.

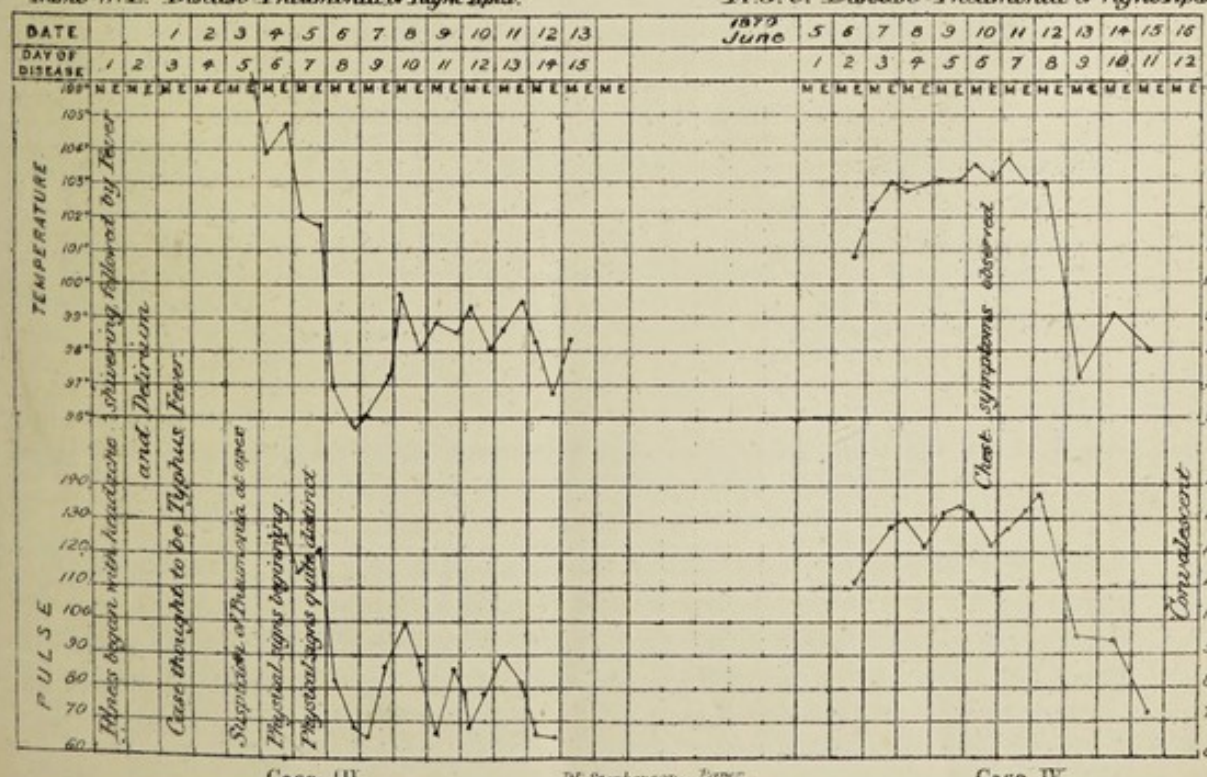


Case I. Case II.

June. 1871.

Name - W.I. Disease - Pneumonia of Right Apex.

M.J.C. Disease - Pneumonia of right Apex.



Case III. Dr Stephenson Paper Case IV.

CASE II.—*Pneumonia of left base, extending to right base on fifth day—Crisis prolonged from seventh to the tenth day.* (*See Chart.*)

Catherine M'Garry, æt. 6, has been a delicate child, liable to coughs and bronchitis. Was quite well on 26th May till the evening, when she had rigors, having overheated herself during the day; 27th, hot and feverish, with short cough, pain in the side, and vomiting.

	Day of Illness.	T.	P.	R.	
May 30	IV.—E.	104°	130	38	Dulness, with tubular breathing over lower two-thirds of *left* lung; no râles; milk and beef-tea; poultices to left side.
„ 31	V.—M.	101·5	130	44	Left side as yesterday; slight dulness and harsh breathing at right base; vespere, occasional moist râles on left.
	E.	103·4	128	44	
June 1	VI.—M.	100·5	120	40	Tubular breathing at *right* base, posteriorly; râles coarser on left; pain in right side.
	E.	103·2	130	48	
„ 2	VII.—M.	101·4	124	50	Subcrepitant râles on both sides; breathing still tubular.
	E.	101·5	124	45	
„ 3	VIII.—M.	101·4	128	50	No marked change.
	E.	102·7	132	55	
„ 4	IX.—M.	101	115	60	Physical signs the same; to have sherry 4 oz., quinine ij. gr., c. tr. scillæ, ter in die.
	E.	101·4	120	55	
„ 5	X.—M.	99·7	100	40	Dulness not so great on left side.
	E.	99·3	100	44	
„ 6	XI.—M.	98·5	95	30	Râles very coarse and abundant.
	E.	99·5	102	42	
„ 7	XII.—M.	98·7	98	40	Left side now as clear as right, though bot slightly dull.
	E.	100·1	102	44	
„ 8	XIII.—M.	98·2	104	44	*Diarrhœa* slight this morning (bowels previously moved regularly and naturally).
	E.	99·3	100	40	
„ 9	XIV.—M.	98	88	40	
	E.	98·2	100	38	
„ 10	XV.—M.	99·4	82	30	Râles continue; no dulness; cough not so troublesome.
	E	99·5	90	30	

Allowed to get up on the 16th; by the 25th all trace of chest affection had disappeared. The chlorides in urine were never markedly diminished during the time she was under observation.

CASE III.—*Pneumonia, right apex—No definite physical sign till sixth day—Marked crisis on seventh day.* (*See Chart.*)

William L., æt. 7½, admitted to Children's Hospital 3d June 1871. Previous to present attack was in good health; illness began on Tuesday, 30th May, with shivering and headache, and acute delirium, followed by high fever, which has continued ever

since. The case, when seen out of doors, was supposed to be typhus fever.

	Day of Illness.	T.	P.	
June 3	V.—E.	106°	124	On admission, the skin is felt to be hot and dry, the tongue moist and thinly furred, the face dark and typhus-like in expression; examination of the chest showed nothing abnormal, except just a suspicion of pneumonia at the apex, but no distinct physical signs can be made out.
,, 4	VI.—M. E.	103·8 104·8	124 124	During last night child has been very delirious; he is very thirsty, and drinks freely of milk and beef-tea. *Chest.*—Respiration rapid and shallow, almost entirely abdominal; tremulous pulsation visible over the large vessels in the neck; anteriorly, a shade of dulness on right side in the acromial half of the subclavicular region; occasional fine crepitation, with sibilant râles over the whole right front; over the upper lobe the respiratory murmur is deficient, with conveyed bronchial sound; in the lower lobe, breathing is exaggerated; posteriorly, percussion natural; exaggerated vesicular breathing; no râles.
,, 5	VII.—M. E.	102 101·8	112 120	Still delirious; lips and teeth coated with sordes; respiration less abdominal, still shallow, quick and uneasy; marked dulness in right subclavicular region; respiratory murmur faint; subcrepitant râles; towards base, exaggerated breathing; scanty râles.
,, 6	VIII.—M. E.	97 95·8	85 68	Physical signs much the same; râles less abundant, heard occasionally at back.
,, 7	IX.—M. E.	96 97·5	65 88	Still improving; appetite good; chest the same.
,, 9	X.—M. E.	98·7 98	65 88	Dulness diminished; no râles. From this date chest symptoms steadily cleared off. Patient dismissed 19th June.

The next case was sent to the hospital as a case of fever; an opinion which the apparent gradual rising of temperature during the second and third day of illness, and the absence of all chest symptoms, confirmed until the sixth day, when the pneumonic expression, quickened breathing, and cough, drew attention to the chest. On entering the ward the house-surgeon remarked—"Does not that child look as if she had pneumonia?" He had examined the chest, but having only directed his attention to the lower lobes, had failed to detect the physical signs.

CASE IV.—*Pneumonia of right apex—Mistaken for fever—Crisis at the end of the eighth day.* (*See Chart.*)

Mary Jane Cochrane, æt. 10, admitted 6th June; taken ill the day before.

DAYS.	II.	III.		IV.		V.		VI.		VII.		VIII.	IX.	X.	XI.
	E.	M.	E.	M.		M.	E.	M.	E.	M.	E.				
T.....	100·8	102·4	103	102·9	103	103·1	103·1	103·5	103·1	103·6	103	103	97·2	99	98
P.....	110	120	128	130	124	132	136	138	124	128	132	138	98	95	72

Sixth day, 10*th June*.—To-day, patient presents a well-marked pneumonic flush of face, the respiration has quickened, and she has, for the first time, a short troublesome cough. Examination of chest shows dulness over upper lobe of right lung, front and back; anteriorly great deficiency of respiratory sound, but copious râles are heard with each cough; posteriorly, tubular breathing and subcrepitant râles on deep inspiration.

Seventh day.—Tubular breathing, but no râles.

Ninth day.—Distinctc risis; T. 97·2°, P. 98; at apex respiratory murmur much softer; expiration prolonged and tubular; under second rib respiration very faint and tubular.

The lung gradually and rapidly cleared up; she made a good recovery, but while in the ward she had absorbed the typhus poison, which manifested itself on 30th June. It was mild in form, and she was dismissed well, 30th August.

CASE V.—*Pneumonia—Right apex—Very slight physical signs—Protracted convalescence—Bi-hourly observations of temperature.*

John Gill, æt. 6 years, admitted 8th May 1872, suffering from want of power in the left leg; a healthy-looking boy, but was delicate until 3 years old. In January had what mother thinks was a rheumatic attack, after which the left leg was noticed to be weak. Thursday, 16th May, patient was allowed out of bed. At night he became out of sorts, and on Friday morning he said he preferred to keep his bed. His skin, however, was cool. At night he became flushed and skin hot. Saturday, 18th May, the skin was again cool, but he became heavy, and the feverishness again returned in the course of the day. Was prescribed by the house-surgeon tincture of aconite, one minim every hour.

19*th May*.—Drowsy and languid; talks in his sleep; cheeks flushed; skin dusky. Respiration is quickened, and each inspiration is accompanied by slight indrawing at the root of the neck. Costal and abdominal movements natural. Some slight cough. A careful examination of the chest failed to detect anything decided. It was recorded, but as an impression only, that the vesicular murmur was somewhat increased at the right apex, posteriorly and anteriorly a slight degree of increased resistance. At the same part, on auscultation, the respiratory sound was of the same character as on the opposite side, yet it appeared to be more distant from the ear.

20*th*.—Cheeks still flushed at times, but the colour often passes off, and the face assumes a degree of pallor. He lies upon his back, and for the most part seems to be sleeping, but is readily roused. Respirations 40 per minute, and almost entirely abdominal. The indrawing at the neck is somewhat increased. He complains of no pain upon inspiration. Auscultation still reveals nothing distinct. The increased puerile respiration posteriorly certainly does not exist to-day, but in front the impression of yesterday is

confirmed, though not increased. Urine, sp. gr. 1025; colour orange; considerable deposits of urates; chlorides diminished; no albumen.

21*st.*—Condition much as yesterday, except not so drowsy. Still talks in his sleep. Respiration 44, still abdominal. Bowels moved once. Tongue clean and moist.

At one spot under left clavicle there is heard occasional, distant, subcrepitant râles, and some sibilus; nothing else.

22*d.*—Continues much the same as yesterday.

23*d.*—Decidedly better. Respirations quiet and easy. He looks about him and amuses himself, but at times gets heavy and drowsy. The temperature has fallen, but shows a tendency to rise. *Auscultation.*—At right apex no râles are heard, but there is a less volume of respiratory sound as compared with the other side, with slightly increased resistance. Stop the aconite.

24*th.*—Continues easier, but has regular accessions of fever. A point of dulness at sternal end of first intercostal space. To have sherry iv. oz. per diem.

25*th.*—In the same condition. To have 4 grains quinine every six hours.

27*th.*—Febrile condition diminishing. Plays a little, but often relapses into sleep. Has a moist cough. Moist sibilus, and has occasional râles over the whole chest.

From this date the temperature kept normal, and the child was removed on 1st June from the hospital against my wishes. The cough, with slight sibilus, continued, but the child's general state was improving. He was beginning to take some food.

Bi-hourly Observations of Temperature in the Case of John Gill.

	A.M.						P.M.						Days of Illness.
	12	2	4	6	8	10	12	2	4	6	8	10	
May 10	...	...	...	...	103·4	...	...	...	...	...	104	105·5	III.
,, 20	105·2	104	104·2	103·8	...	...	104·9	105	...	104·4	104	104·4	IV.
,, 21	105·2	103·6	104·2	102·4	102	101	102·5	104	103·8	103·8	103·4	103	V.
,, 22	103·4	104·2	104·2	101·8	100·6	102·2	101·8	103·8	104·2	102·6	104·8	103·8	VI.
,, 23	103·4	104·2	105	102·3	102	102·4	99·6	100·8	101·8	101·6	101·4	102	VII.
,, 24	102·8	102·4	103·2	101·3	101·6	101·4	103·8	104·2	101·2	97·8	100·8	103·7	VIII.
,, 25	102·5	102·4	100·8	100·8	99	101	103·2	104·8	102·8	104	104	...	IX.
,, 26	102	100·3	100·3	100·3	100·4	94	100·2	100·6	104	101·2	100·6	99·4	X.
,, 27	99·3	99·2	100	100·4	99	99	100·8	103·2	101·9	98·6	97·6	98·2	XI.
,, 28	99	100·3	99·6	98·8	98	99·6	102·2	98·2	99·2	99	97·6	99·2	XII.

CASE VI.—*Pneumonia, right apex, fatal in 24 hours—Physical signs of complete consolidation from the first.*

Philip Ross, æt. 2½, admitted 21st Nov. 1873.

Patient was running about the house, and seemed quite well yesterday till night, when he was suddenly seized with severe shivering

and vomiting, quick breathing, and high fever, with a good deal of wandering. When seen at home (by Dr Stephenson) at 11 A.M. the skin was pungently hot, his breathing rapid, with audible expiration. The child was exceedingly restless. A hurried examination of the chest revealed perfect dulness at right apex anteriorly. Posteriorly there did not seem to be any dulness, but further examination was prevented by the restlessness of the child.

After admission—(4.30 P.M.).—Pulse 144, small and feeble; respirations 70 per minute, audible and expiratory in character; skin feels cool, face pale, no flush.

Chest, front, right side.—Dulness absolute at apex, less so below nipple, clear in the axillary region; bronchial breathing throughout. *Left.*—Percussion natural, harsh vesicular breathing, no râles. *Back, right side above spine of scapula.*—Dull, but not nearly so decided as in front; respiratory murmur over the same region also bronchial, but not so harsh as in front; the rest of chest is resonant, breathing harsh, vesicular; some coarse moist râles at left base. Patient inclines to doze off asleep, but starts up every few minutes in great alarm. Ordered mixture containing citrate of ammonia and sp. chloroformi. Hot fomentations to chest. Four ounces sherry to be made into wine-whey.

Temperature in axilla, half an hour after being put to bed, was 99·4°; at 5 P.M. 104·3°.

During the afternoon the breathing continued much the same, until a few minutes past 8 o'clock, when the nurse, while applying fresh fomentations, observed that the breathing was very calm, and getting slower. The house-surgeon having been summoned, he found the respirations were feeble, the eyes squinting, pupils dilated, hands clenched, and all the muscles in a state of fixed contraction. In this state the child died at 8.40.

Post-mortem Examination (*by Prof. Sanders*).—Heart—pericardium healthy, right auricle and ventricle full of blood, left auricle and ventricle empty. Left pleura healthy, left lung congested, otherwise healthy. Right pleura contained about 10 oz. clear serum. Pleura pulmonalis and costalis covered with white exudation bands, which unite the surface of the lungs to the chest-walls superiorly and posteriorly. Upper lobe swollen and hard (pneumonic); lower compressed, but soft. On section of lung there are found in upper lobe, towards the anterior margin, circumscribed patches from the size of a pea to an almond, consisting of soft white exudation; the larger, of red hæmorrhagic exudation. Liver and spleen healthy. Kidneys congested; otherwise healthy.

This case belongs to a type of the disease which is not uncommon in children, and which, I think, ought to be clinically disassociated from the others. The example given is exceptional in the extreme rapidity of the fatal termination; but I have met with several cases possessing the same characters, all of which proved fatal within three, or at most four, days. They are marked by the intensity of

the general symptoms, dyspnœa and nervous derangements, but not necessarily a higher range of temperature than is met with in the favourable type; at the same time, however, the pulse is unduly higher in relation to the temperature. But the most important difference lies in the extremely early consolidation of the lung; excessive in degree, though often very limited in extent. At the first onset, as in the above case, the dulness may be absolute, with clear, dry, tubular breathing, or a complete absence of breath-sounds. This marked difference, together with the fatal character, clearly point to a difference in the essential nature of the affection, although we are unable to say in what it consists; and in all deductions, as to treatment or otherwise, these cases must be regarded as belonging to a distinct type, and ought not to be combined with the others. Did they differ only in their early fatal termination, we would be justified in concluding that the cause lay in the too great dynamic blow received by the nervous system; and this may indeed be true, but we have likewise to explain the marked difference in the lung lesion. The next case also belongs to this type. It was associated with an extreme degree of blood-changes, which would sufficiently account for the difference; but such is not always the case. Philip Ross appeared in good health up to the attack, and there was no perceptable change in his blood. I have met with the affection in a fine healthy child, nine months old, where it was apparently caused by his having been kept out late the previous evening. In the morning, after a restless night, he was seized with violent convulsions, and in the afternoon I found complete consolidation over the whole of one lung. He died the following day, the second of the illness. I can recall to memory other cases in healthy children, so that neither a cachectic state, nor any apparent blood-poisoning, can account for the special features of this type. Whether pathological histology will ever throw any light on the subject, I cannot say, as it is only of late I have been led to disassociate these cases from the other kinds. But to those who would object to the grounds I have given, as insufficient to found any difference upon, I would remark that all the varieties of pneumonia have special clinical features by which they can be recognised, and their clinical study and pathological research have gone hand-and-hand together, now one and now the other leading the way to their differentiation.

Case VII.—*Pneumonia of right apex, with marked blood-disorganization, fatal in three days.*

William Douglas, æt. 13, an inmate of the United Industrial School; a healthy boy; body well nourished. He went about the school as usual, and made no complaint on Thursday, 4th April 1873; but now says he felt "sick and unhappy." On Friday morning he vomited, and did not rise with the other children. He continued to vomit occasionally during the day, but there were no

symptoms other than an ordinary attack of deranged stomach, and a powder of compound rhubarb was administered. On Saturday morning, when the sergeant visited him, he was struck by his prostrate condition, and dark colour of the point of his nose. The vomiting had continued at short intervals. When seen by Dr Stephenson, he was at once removed to the Children's Hospital.

State on admission.—Patient is in a state of great prostration; features are pinched; face sallow, with somewhat icteric colour of the skin and conjunctiva; a dark ring under both eyes; point of the nose bluish-black; the feet are also livid and ecchymosed in patches; nails of fingers dark, but not discoloured.

Eyes.—Right pupil, contracted; left, largely dilated; both, almost quite insensible to light; patient can tell the number of fingers held up equally with either eye.

Pulse.—Extremely weak and rapid, somewhat near 200.

Respirations.—Very irregular in frequency; sometimes deep, at other times shallow.

Chest.—At right side posteriorly there is complete dulness from the apex to a finger's breadth below spine of scapula, and over that region only a feeble respiratory sound is heard; below spine, breathing is bronchial in character; rest of chest, in a hurried examination, seemed normal.

Liver.—Dulness, normal; some tenderness on pressure over that region.

The mind is quite clear; no stupor. Temp., 103·8°; pulse, 180.

Ordered.—℞ Tr. ferri mur., ʒiv.; potass. chlorat., ʒiij.; aq. ad ℥vj. Half an ounce every quarter of an hour, for one hour; afterwards, every hour. Brandy and white of egg with phosphate of soda and chloride of sodium, well mixed, in half-ounce doses, frequently. An enema to be administered.

6*th April.*—Has been restless and delirious all night; bowels moved with enema; everything taken has come up; condition in every way the same; enemas of beef-tea and brandy have been given, and only brandy and soda-water by the mouth. In the afternoon the vomiting was not quite so frequent, but prostration more marked; extremities, cold; fingers, livid; urine, albuminous.

T. M. 99·6
E. 100·5
P. — + 180 —

7*th.*—Passed an extremely restless night; delirium continues, but the boy answers questions readily; vomiting stopped at 1 A.M.; enemas have since been discontinued, beef-tea and brandy being retained by the stomach; prostration increased, and patient sank at noon. The blood was examined microscopically during life; the red corpuscles were pale in colour, swollen and sticky, not forming into rouleaux.

Autopsy.—Old fibrous adhesions of both pleuræ; left lung congested in inferior lobe; upper lobe, natural.

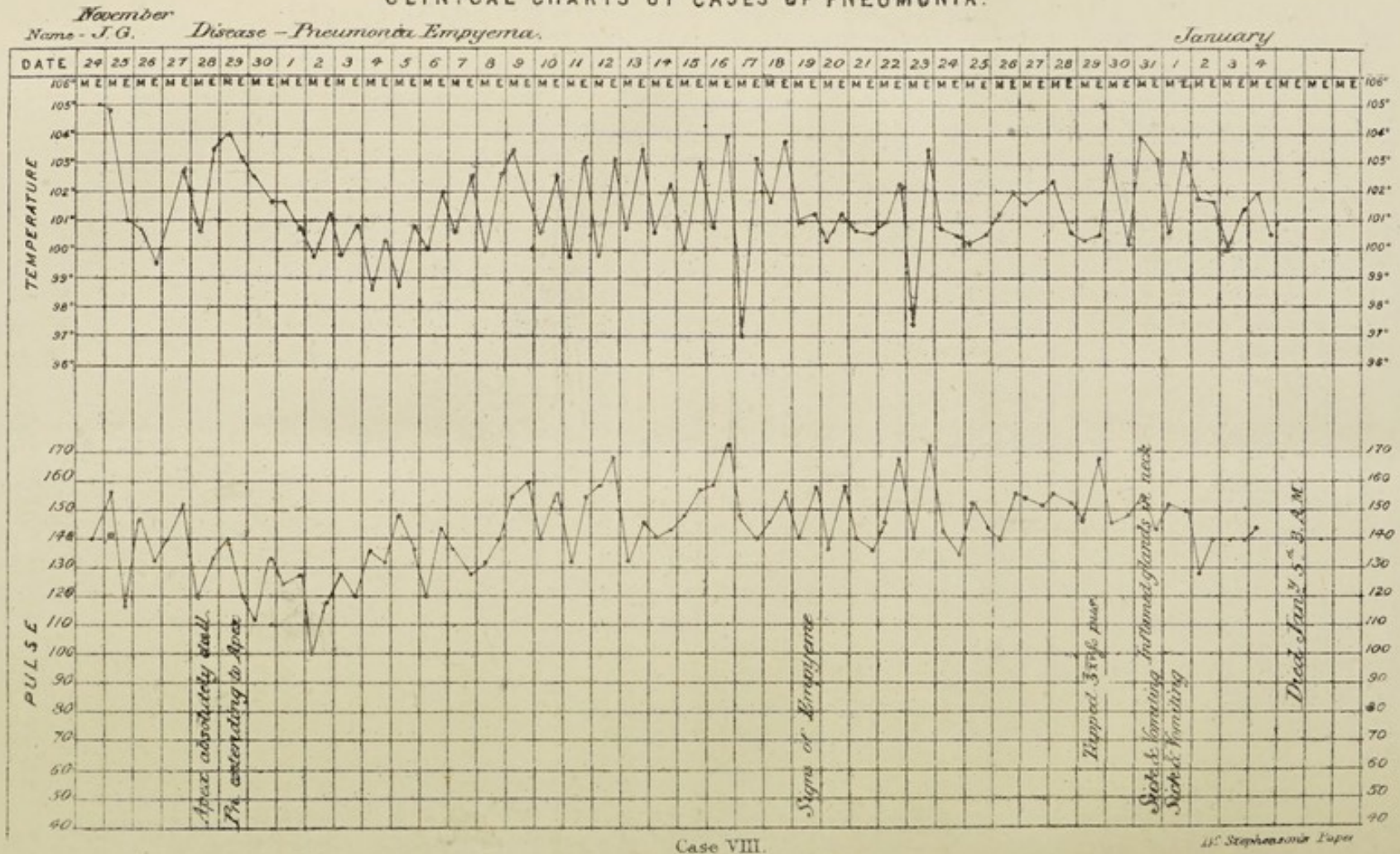
Right Lung.—Upper lobe in a state of gray purulent hepatization; lower lobe, congested; other organs, healthy.

CASE VIII.—*Pneumonia of left base, extending upwards, and finally involving the whole lung—Empyema—Paracentesis—Death.* (*See Chart.*)

John Gifford, æt. 4, admitted 24th November 1870. Patient left the hospital on 14th November, being then convalescent from a mild febrile attack; has been feverish, with cough and difficult breathing, for about four or five days.

	T.	P.	
Nov. 24—E.	105°	140	Considerable cough and dyspnœa; audible expiratory respiration; marked dulness; bronchial breathing at left base; slight dulness at right base.
,, 25—M.	104·8	155	
E.	101	115	
,, 26—M.	100·8	148	* *The distinct fall of temperature shows an effort towards crisis, probably the seventh day; but a rise again takes place, with the extension of the inflammation to the upper lobe.*
E.	99·4	132	
,, 27—M.		140	
E.	102·8	150	
,, 28—M.	100·5	120	Dulness has extended over whole left side, but slighter at the apex than base; breathing bronchial throughout; right—harsh, vesicular, with coarse rhonchus; urine very scanty, contains a slight amount of albumen.
E.	103·5	135	
,, 29—M.	104	140	Absolute dulness at apex; intense bronchial breathing; respiration still expiratory; urine still scanty—albumen, a trace.
E.	103·8	120	
,, 30—M.	102·6	112	Patient seems worse; breathing very rapid, with increased expiratory character; physical signs remain the same.
E.	101·6	132	
Dec. 1—M.	101·6	124	Breathing more easily; seems better, still restless and uneasy.
E.	100·8	128	
,, 2—M.	99·8	100	* *Again an effort at crisis, with improvement in general condition; the evening temperature and high pulse show that general appearances are deceptive.*
E.	101·3	118	
,, 3—M.	99·9	128	
E.	100·8	120	
,, 4—M.	98·4	136	Since last date he has steadily improved in his general condition, sits up in bed, and takes his meals heartily.
E.	100·5	132	
,, 5—M.	98·8	148	Dulness still absolute at apex, but clearing slightly at base; respiratory murmur distinctly tubular, at apex seems distant.
E.	100·8	136	
,, 6—M.	100	120	
E.	102	144	
,, 7—M.	100·7	136	
E.	102·7	128	
,, 8—M.	100	132	* *A steady rise in both evening and morning temperatures has been taking place; and the pulse, always relatively high, is becoming to be out of all relation to the temperature.*
E.	102·7	140	
,, 9—M.	103·5	155	
E.		160	
,, 10—M.	100·7	140	
E.	102·7	155	

CLINICAL CHARTS OF CASES OF PNEUMONIA.



Case VIII.

US Stephenson Paper

	T.	P.	
Dec. 11—M.	99·8°	132	Patient continues sometimes better, sometimes worse, still taking his food and brandy; the urine is greater in quantity, still slightly albuminous; respirations are still slightly expiratory; physical signs remain much the same.
E.	103·4	155	
,, 12—M.	99·8	158	
E.	103·2	168	
,, 13—M.	100·7	132	
E.	103·7	144	
,, 14—M.	100·5	140	
E.	102·3	144	
,, 15—M.	100	148	
E.	103	156	
,, 16—M.	100·8	150	
E.	104	172	
,, 17—M.	97	148	
E.	103·2	140	
,, 18—M.	101·5	144	Dulness still absolute in front, but only comparative behind; respiratory murmur still tubular in front, but at base posterior somewhat more healthy in character.
E.	103·8	155	
,, 19—M.	101	140	
E.	101·3	158	
,, 20—M.	100·3	136	
E.	101·4	160	
,, 21—M.	100·8	140	
E.	100·6	136	
,, 22—M.	101	142	
E.	102·3	168	
,, 23—M.	97·3	140	Upon examination to-day, there is discovered to be great bulging of left side, even up to the subclavicular region, with want of costal movement; the skin is slightly œdematous, and the intercostal spaces are not visible; cardiac pulsation is felt to the right of the sternum; on percussion there is absolute dulness.
E.	103·6	170	
,, 24—M.	100·8	142	
E.	100·6	136	
,, 25—M.	100·2	150	
E.	100·5	144	
,, 26—M.	101·2	140	
E.	102	156	
,, 27—M.	101·8	154	
E.	102·1	150	
,, 28—M.	102·4	154	
E.	100·5	152	
,, 29—M.	100·4	148	Seen in consultation by Drs Linton, Gamgee, and Stephenson; though deemed almost hopeless, it was thought proper that paracentesis should be performed, as the only prospect of affording any benefit; fifteen and a half ounces of healthy pus were withdrawn through a Bowditch syringe.
E.	100·5	168	
,, 30—M.	103·2	144	
E.	100·2	148	

	T.	P.	
Dec. 31—M.	104°	154	
E.	103·2	144	
Jan. 1—M.	100·7	150	Patient seems to have gained slightly in strength since the operation; his breathing is easier, and he is able to sit up in bed to take his meals; bowels natural; appetite improved; heart now beats under xiphoid; dulness continues over whole left side, but not so absolute in degree; child restless, and cries when auscultation is attempted.
E.	103·3	150	
,, 2—M.	101·9	128	During last 24 hours has only passed one and a half ounces of urine, highly albuminous; vomits his food, but retains egg-flip and brandy; there is a considerable fœtid discharge from his nostrils.
E.	101·8	140	
,, 3—M.	100	140	Is looking very feeble, but will still sit up in bed for a few minutes at a time; vomiting increased; nothing retained; urine, five ounces.
E.	101·6	140	
,, 4—M.	102	144	No urine to-day; beef-tea and brandy injections have been regularly administered, but he is fast sinking.
E.	108	144	
,, 5.			Died morning of 5th.

In this case we have an example of acute pneumonia running an unfavourable course. The child had been poorly nourished, and his health was further diminished by a previous peculiar and anomalous attack, with a high pulse, but a range of temperature at first only slightly increased, but afterwards below normal. He was evidently in a cachectic state before the attack. The exact date of the beginning of the pneumonia could not be ascertained. Upon examining his chart, we find a pseudo-crisis taking place, much more marked by the temperature than the pulse. An increase of fever occurred coincident with the extension of the consolidation to the upper lobe, and was again followed by an imperfect crisis. The temperature reached the normal only in the mornings of the 4th and 5th December; and though the general condition had improved, and he sat up in bed and looked about him, yet the steady rising of the pulse during this time showed the deceptiveness of appearances.

From the first, the range of pulse was out of proportion to the temperature, and kept this character throughout; thus indicating, far more than the temperature, the unfavourable type of the disease. From the 7th to the 18th December, the temperature chart presents the characters usually met with where morbid products are undergoing change. The empyema began after the 18th, as is evident by the examination of the chest on that day; and a distinct change in the character of the temperature is observed; the range keeping much more steady, indicative of the occurrence of a complication; the kidney affection was the immediate cause of death.

Since I began the practice of recording cases in the form of a clinical chart, the number of cases of acute pneumonia are too few

from which to draw general conclusions, such as the proportion in which the apex is affected, the period of the manifestation of physical signs, and such like. Still, even the selection from them I have above made, are sufficient to illustrate some general observations. Much of the debatable ground with reference to pneumonia has been created by the want of the due recognition of the varieties included under that term; and much diversity of opinion, especially regarding treatment, has arisen from lumping together all the kinds, and the want of attention to the natural history of the affection.

It is clear that, taking the clinical chart as the proper representation of the disease, and not the mere auscultatory signs, that the true acute pneumonia is an affection which presents a well-marked typical chart, in which the temperature attains an immediate high range, and after running a pretty steady course, manifests, from the fifth to the seventh day, a distinct tendency to a crisis. From disturbing influences, however, the fever may be prolonged to considerably beyond that period; but when such is the case, the typical character is still manifested by a pseudo-crisis. This may be seen in the long-protracted and fatal case (No. VIII.), and in Case II., where, from extension of the inflammatory action, it terminated by a lysis, beginning on the fifth day, and extending to the tenth.

When due allowance, then, is made for disturbing influences, the affection must be regarded as possessing a strictly typical character, which differs in children in no way from the same affection in the adult.

Comparing the temperature and pulse range with the physical signs, no constant relation is perceptible, neither in time nor degree. An early consolidation does not hasten the crisis, and a very slight amount of lung-lesion is accompanied by the same typical character of fever as where a large portion of the lung-tissue is involved. The normal period for the fastigium appears to be five days, and during this time the febrile character is constant. It is only during the latter stage that some variation is met with, where disturbing influences have most power, and where the influence of treatment, it is probable, will become most apparent.

Since the introduction of the thermometer into clinical use, there has been a tendency to rely too much upon its evidence alone, as the test of the severity of the disease; and it is generally believed that the temperature in severe cases is always proportionately higher than in the milder forms. Such, however, is not an accurate expression of the case, if by severe we mean unfavourable. In Case III. (Lonie), the fever was sharp, and the highest temperature recorded above (106°) occurred in it; yet it was one of the most typical and favourable cases. Among the fatal cases, 105° is the highest temperature (Gifford). In Philip Ross it was 104·3°. When, however, we compare the relative range of temperature and pulse,

a marked difference is found: 105° with a pulse of 140; 106°, pulse 124; 104° in the fatal cases corresponding to a pulse of 144 to 150; while in the favourable cases with only 130 to 136. It is therefore less by the height of the temperature, than by the relative range of temperature and pulse, that we are to form an opinion as to prognosis,—a point which has an important bearing on treatment.

The treatment adopted in the cases recorded, except where otherwise stated, consisted of warm poultices to the chest, and a simple mixture containing acetate of ammonia, so that they may be regarded as having run their natural course uninfluenced by medicine; my object being to first establish a basis as to the natural history of the disease in its different phases, for future comparison, and the obtaining of some principles to regulate the treatment.

The physical signs of pneumonia, we have seen, cannot form alone the basis of classification, nor determine the treatment. The whole clinical chart must be taken into consideration.

Nor can an aggregate mortality—too often taken as the criterion—ever fairly represent the result of therapeutic measures. For in so testing the subject there are included the cases which would have proved favourable, whatever the treatment, and those also which would be fatal, in spite of all that could be done. The physician's art is one of specialization, and any definite result cannot be obtained by applying to it the principle of generalization, however useful that method may be in its legitimate sphere. A carefully particularized study of one case, accurately and fully recorded, may be more fruitful in practical results than fifty or a hundred thrown loosely together.

Treatment may be directed towards very different ends, and it is part of the physician's art to determine for what purpose his aid is required. Many cases occur where nothing further is necessary than to place the patient under the most favourable circumstances for recovery. Some remedial measures are required in others, not as against the disease, but to relieve the suffering and promote the comfort of the patient. At times, also, concurrent phenomena may arise, endangering life, distinct from the phenomena proper to the disease, and these must be met. While, lastly, the treatment may be directed against the disease proper, with the aim of modifying or cutting short its course.

Nothing I know of in medicine entitles us to expect that we can ever change for good the well-marked typical course of acute pneumonia. Before ever the patient can be brought under our care, the system has received a morbid impulse, by which a pyretic wave has arisen, which will run its course. There can be no true cutting short the disease. Where such a term is used, it can only apply to the prolongation out of due limit of the affection. Any time after the fifth day a rapid and favourable termination may occur, and this natural course has undoubtedly

led, in former times, to very erroneous opinions as to the result of active interference.

The test of treatment should be the closeness with which the fever accords to the normal type. It is not necessary to show any material lowering of temperature or pulse, so long as these are within the normal range; but it is essential, whether the range is affected or not, that the typical course should be retained. Should the treatment adopted succeed in lowering the range during the first five or six days, but at the same time the chart show a divergence from the normal character as regards crisis, and especially if the stage of convalescence is delayed, then I should regard such treatment as unsuccessful and meddlesome, although it terminated in recovery.[1]

When the range of temperature or pulse is above the normal for the disease, or the one out of due relation to the other, such excess should be combated. And if evidence of reduction is found, it is then legitimate to gain it at the expense of protracting the recovery. If, again, life be endangered by any special condition, the means of counteracting it may likewise be bought at the expense of the convalescence. But, with these exceptions, the value of therapeutic agencies is only to be estimated by the accordance with the typical character of the disease.

The alchymists of old were great experimentalists, and succeeded in forming many chemical substances, but the science of chemistry made no advance so long as air and water were regarded as elements, and that phlogiston entered into and devoured a body like a ravenous animal. Nor is our position far different so long as we regard and treat fever and inflammation as either simple or invariable compound states, or that there is any entity in disease, to be met by the same treatment in all cases. That fever is a complex state, and that its elements enter into varying proportion with one another, is duly recognised in the science, but much less so in the art of medicine. We have two of its elements, and are able to estimate and record them in the temperature and pulse, and these have of late been too much regarded as the sole representatives of fever. But there is another element which we can, as yet, but inferentially estimate and cannot record, and on this account, probably, it has been too much lost sight of.

Physicians, in feeling the pulse, constantly take cognisance of more than its rapidity; the character is all-important. We constantly see the same phenomena, especially nervous symptoms, occurring under two very different and opposite states of the system. The same temperature may occur at the beginning and at the end of a fever, but with different significance. Why is the diurnal range of temperature at the beginning of a fever so much more steady than at the end? Why are some febrile states characterized by great oscillations between morning and evening tem-

[1] This, according to M. Barthez, is the effect produced by indiscriminate active measures, especially bloodletting.—*Syd. Society Year-Book*, 1862.

perature? There is an important something in all these which is not directly represented in our charts, but of which, in treatment, we must take cognisance. This something I am in the habit of speaking of as tension—a term used in electricity, and probably a closely allied condition to what it there represents.

The estimation of this condition is of great importance. The degree of tension makes up the difference between two cases which may present the same average temperature. Treatment may be directed towards it, and we may succeed in lowering the tension without affecting the temperature: another point which is too much overlooked at the present time, when temperature is taken as the chief representative of fever. The relative range of temperature and pulse, I am inclined to think, may yet afford us some means of estimating the tension. Thus, in the case of Lonie (No. 3), there occurred the temperature of 106°, with a pulse relatively much too low, viz., 124, and the tension at the time was very high, while in other cases 104° was associated with a pulse of 130 to 136; and this is just the condition which physiology teaches us would exist. On the other hand, as we have seen, the fatal cases presented a pulse relatively too high for the temperature. If I am right in my inference, successful treatment may be represented by an actual rise in the rate of the pulse.

The influence of tension on temperature may also perhaps be seen in the degree of oscillation between morning and evening, where tension is great, as at the beginning of the inflammatory attack the range is even, but when slight the oscillations increase, and when they have been well marked, and a complication occurs, as in the case with empyema, the temperature again becomes steady.

Thus we may be able inferentially to deduce the amount of tension from the data on our charts; and the evidence so gained must be carefully weighed in deducing the results of treatment. In the treatment of acute febrile diseases, the attention of the profession has lately been entirely directed to the reduction of the pulse and temperature, and the value of remedial measures estimated by this alone. By so doing, it is my opinion that we lose sight of many important indications, and are apt to overlook much benefit that may be derived from remedies which do not affect directly the temperature. If the height of the temperature is within the normal type of the disease, and if the pulse is within the normal relation to that temperature, little good will be got by any attempts to alter their range, etc.

As I have already pointed out, the prognosis of pneumonia depends much less upon the height of the temperature alone than upon the relation of pulse and temperature. It is therefore to this point our attention should be addressed, and to the other means whereby what I have termed tension may be estimated.

The use of warm compresses to the chest is of great value in all cases. Where tension is great, and where head symptoms are

present, the whole body may be placed in a warm "pack." No means is more conducive to the comfort of the patient; the general uneasiness and sense of fulness of the system is allayed, and natural sleep induced. At the same time, it must be remarked, I have never observed any decided change in the temperature or pulse from the use of the pack, but nevertheless the quiet and comfort afforded thereby is very evident.

Where further means are necessary to reduce tension, we have the selection of three valuable remedies—aconite, antimony, or ipecacuan; but the good to be got from these is only within the first thirty-six or forty-eight hours. They should not be continued longer, and never, for any theoretical action upon the lung lesion, should they be given when the pulse is relatively high for the temperature. The large majority of cases, indeed, may be best treated by ipecacuan or aconite, and acetate of ammonia. The value of aconite in acute inflammatory disease may be denied if we judge of it by its power of lowering pulse and temperature, or cutting short the disease. Looking for its action in these quarters, I long disbelieved in its good effects, but have lately had my confidence in it renewed by observing the increased comfort of the patient, and the lowering of the tension where high, under its use. I have not yet, however, been able to record a definite action in the clinical chart to change mere opinion into conviction. In case 5 (John Gill), where aconite was given throughout the febrile attack, it is worthy of note how the convalescence was prolonged by recurring high temperatures. Without assigning this to the effect of the unnecessarily prolonged use of the remedy, the circumstance must be noted at present in connexion with it.

In a few rare cases, in healthy children, where the onset of the disease is associated with considerable dyspnœa, bloodletting by leeches between the scapulæ may be employed with undoubted effect; also, when pain in the chest is very severe and preventing rest, a single leech to the seat of pain will afford great relief.

Where the pulse is high in relation to the temperature, quite an opposite line of treatment must be followed. Here quinine, iron, and digitalis, singly or in varying combination, are the remedies indicated. In pneumonia occurring amidst the sequelæ of scarlet fever, I have seen good results also from belladonna. The selection must turn upon the due recognition of the constitutional state giving rise to the inordinate pulse. Various conditions may so act—the effect of the high temperature upon the nervous system, the amount of blood deterioration, a general cachectic state, or simple atony of the muscular vascular system.

Several remedies may likewise be employed to minister to the comfort of the patient. I would specially mention morphia and spirit of chloroform.

Salines may be given from the first, in combination with the other medicines enumerated, and their use may be continued with

benefit after the febrile stage has passed off—during the process of resolution. In this stage alone, and when the health of the child has been previously good, is any benefit ever to be derived from the use of mercurials. Where the process of resolution is tardy, or has been arrested, I have seen decided benefit from *small* doses of mercury.

The space at my disposal permits only of thus indicating the principles upon which the treatment must be regulated. I would only further remark, that the value of such treatment must be estimated by these principles, the soundness of the evidence upon which they are based, and the result of their application in *individual* cases; whilst the skill of the physician is displayed in the proper estimation of the "situation," in the foresight of danger, and in the practical working out, in each individual case, of the principles which his science has established.

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