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PART I.

ORIGINAL COMMUNICATIONS.

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ART. I.—*Researches on the State of the Heart, and the Use of Wine in Typhous Fever.* BY WILLIAM STOKES, M. D., M. R. I. A., Honorary Fellow of the King and Queen's College of Physicians, &c.

**B**EFORE I enter on the investigations which form the basis of this paper, I may premise, that I consider typhous fever as an essential disease, not symptomatic of any known local lesion. To British readers this may appear unnecessary, as it is only the expression of opinions entertained by our most learned and experienced physicians. But as on the Continent a different doctrine is held by some eminent pathologists, and as I have found it necessary to state to many continental physicians who have honoured the Meath Hospital with their presence, that we were opposed to the doctrine of localization, I trust that the expression of these opinions will not be considered unnecessary or egotistical by my readers at home.

There can be no doubt that the typhus of Great Britain and Ireland is a disease of the whole system, not symptomatic of any particular local lesion; shewing on the one hand a tendency to a favourable termination, after a period which varies indefinitely; and on the other, being capable of destroying life *with* various lesions, or *without* any appreciable change in the solids. It is a disease on which anatomy sheds but a negative light, not telling us what it is, but rather what it is not.

With respect to the organic lesions, I consider them as much secondary to the general disease, as the pustule in small-pox is to the disease of variola. Their not unfrequent absence in the worst cases of the disease proves that they are not the cause of typhus, while in cases where they do occur, we observe a signal want of proportion between their amount, and the severity of the symptoms. They are in the fullest sense inconstant in their seat and extent, incompetent to the explanation of symptoms, and unnecessary to the characteristic phenomena of the disease.

In making these observations I do not mean to throw the slightest doubt on the accuracy of those observations, which, accumulating for many years, have shewn the singular frequency of intestinal ulceration in the fever at Paris and other situations on the Continent. That there exists a much greater disposition to these forms of disease in those situations must be admitted, a frequency almost sufficient to justify the doctrine of the justly celebrated Broussais, that typhus was but a gastro-enteric irritation. But as my excellent friend Dr. Staberoh has well remarked, we must study disease in various countries before we come to any conclusions as to its nature. Had Broussais examined the typhus of Great Britain and Ireland he would never have formed his theory of fever.\*

If we compare the inexperienced man with him who has

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\* Dr. Lombard of Geneva has lately endeavoured to shew that the typhous fever of Ireland is a peculiar affection, differing from that of the Continent in the ab-

had a long continued practice in fever, we may often observe that the former employs a too vigorous antiphlogistic treatment in the commencement of the disease, and delays the exhibition of stimulants until the powers of life are sunk too low, while the latter is much more cautious in husbanding the strength of his patient, and shews much less fear of resorting to wine and other stimulants. It is in determining on the use of wine in fever that the junior or inexperienced man feels the greatest difficulty; it is in its exhibition that he betrays the greatest uncertainty and fear. This is to be explained by referring to the general character of the doctrines which have prevailed within the last quarter of a century, and which are only now beginning to yield to a more rational pathology. The doctrine of an exclusive or almost exclusive solidism, which referred all diseases to visible changes of organs, which taught that inflammation was the first and principal morbid phenomenon, and that fevers were always the result of—or accompanied with—some local inflammation, was, how-

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sence of ulcerations. (See *Dublin Medical Journal*, vol. x. pp. 17, 101.) But the fact is, that intestinal ulcerations have been repeatedly observed in the typhus of Ireland, their amount and frequency varying with the epidemic influence. Of this we have abundant evidence in Doctor Cheyne's Reports. (See *Dublin Hospital Reports*, vols. i. and ii.) And in the epidemic of 1826 and 1827 we observed the follicular ulcerations (dothi-enteritis of the French) in the greater number of cases. In many instances perforation took place, and the whole group of vital and cadaveric phenomena, corresponded almost exactly to the dothi-enteric typhus of the French authors. The prominent symptoms were thirst, nausea, epigastric tenderness, vomiting, diarrhoea, and tympanitis, and in almost every dissection we found the ulcerated patches of the small intestine. Since then no severe or decided epidemic of fever has occurred, but cases of typhus are to be met with, with or without this peculiar lesion. The researches of Dr. Bright and others in London, and of Dr. Staberoh in Glasgow shew, that ulcerations of the intestine occur not unfrequently in the typhous fever in these situations. We cannot then find any general distinction of British or Continental fevers on this circumstance, the difference is in the degree of liability. This may be explained by local circumstances, and original dispositions inherent in particular races.

ever disguised under various denominations, the doctrine taught to the majority of our students. Their ideas were thus exclusively anatomical; inflammation formed the basis of their limited pathology, and thus instructed, they entered on the wide field of practice, most of them having never even attended a fever hospital; utterly ignorant of the nature of essential fevers, they applied, in the diseases of debility, the treatment of acute local inflammation, and delayed stimulation until nature could not be stimulated.

Let it not be supposed that in this picture I seek to make a favourable contrast between the education which I myself received, and that given to others. Far from it; I confess that it was not until several years after I commenced practice that I became fully aware of the erroneousness of what is termed the anatomical theory of disease; and I feel certain, humiliating though the confession may be, that the fear of stimulants in fever with which I was imbued, was the means of my losing many patients whose lives would have been saved, had I trusted less to the doctrine of inflammation, and more to the lessons of experience, given to us by men who observed and wrote before the times of Bichat or of Hunter.

The hospital physician will be frequently asked by students to state the principle on which he administers wine in fever, I conceive that the question may be thus answered. Typhous fever is a disease which has a tendency to a spontaneous and favourable termination, but one in the course of which the powers of life are attacked by a most malignant influence. By wine, food, and other stimulants we support nature, until the struggle is past, so that, to use the words of an ancient author, which embody a more profound principle than appears at first sight, we "*cure the patient by preventing him from dying;*" that is to say, we prolong his existence until the natural and favourable termination of the disease arrives. We do not allow our patients to die of exhaustion, and bearing in mind the depressing influence they have to struggle with, we give stimulants at the

proper time, and with a bold hand. We give our patients an artificial life, until the period arrives when nature and health resume their sway.

Yet, though we may admire the practice of an experienced physician in the use of wine in fever, it will often be found that he has a difficulty in expressing any exact reason for adopting the practice in a particular case. His practice is founded on a knowledge which is often incommunicable, an almost instinctive perception of the necessity for stimulation, characteristic of the great physician, and only to be obtained by a long and close familiarity with the disease. But is there any rule by which *the inexperienced man* can be guided? any one distinct phenomenon, the observation of which is easy, and leading to an intelligible and communicable rule of practice. If the following statement of facts shall assist the inexperienced man in the treatment of a single case of fever, I shall feel more than rewarded, for I am convinced that it is to the fear of wine, or to ignorance of the principles of its exhibition, that we are to attribute the loss of many lives in the typhous fever of this country. I shall first speak of the influence of wine on the circulation in fever, and examine the phenomena of the pulse, the force of the heart, and the character of its sounds.

We have long observed, that when under the influence of wine the pulse became less and less frequent, the termination of the case was generally favourable, and as might be expected, the contrary result led to a bad prognosis. This practical observation I do not put forward as original, but I wish to express my great confidence in its truth.

Let us suppose a case of typhus on the tenth day of fever, and presenting severe symptoms of prostration, the pulse varying from 115 to 120. Wine is exhibited, and on the first day the pulse rises to 125, on the second to 130, and if on the third day there is no diminution, we may make a bad prognosis; and thus the following rule may be laid down, that when in a case where the symptoms seem to indicate wine, the pulse

either does not come down, or increases in frequency under its influence, we may expect a bad result.

These facts naturally lead to the examination of the state of the heart in typhous fever, and the cases in this report are so arranged, as to exhibit together the condition of the heart, and the amount of wine employed. *In this investigation we have sought for an additional rule, drawn from the state of the heart itself, to guide the inexperienced man in the exhibition of wine, and I am not without hopes, that in the careful study of the cardiac phenomena, an indication hitherto unobserved will be obtained.*

In typhous fever two opposite conditions of the heart may be observed ; in the one the impulse becomes extremely feeble, or altogether wanting, while the sounds are greatly diminished in intensity ; while in the other, the heart's action and sounds continue vigorous throughout the whole course of the disease.

These opposite states are not necessarily revealed by the state of the pulse, or the warmth of the surface. We may observe a hot skin, while the action of the heart is almost imperceptible, and on the other hand a patient may be pulseless, cold, and livid for days together, while the heart is acting with the greatest vigour.

The condition of the heart must be determined by the application of the hand and stethoscope to the infra-mammary and sternal regions. Of this principle the following case is an illustration :

*CASE I.—Petechial Typhous Fever with extreme prostration ; Failure of the Pulse, and Coldness of the Breath and Surface, with vigorous Action of the Heart ; liberal Use of Stimulants ; Employment of Transfusion of Blood ; Death ; Absence of organic Lesion.*

A middle aged woman was admitted into our wards in February 1837, at an early period of her fever. She had attended

upon and washed the clothes of a person who had died of a peculiarly malignant fever, yet on admission, and for several days subsequently, she presented no symptom beyond those of an ordinary and rather mild case of maculated typhus. From the first, however, she had a strong presentiment of death, which nothing could shake; she gradually became more and more collapsed; the surface was of a violet hue; the countenance sunken; and the skin and breath cold. From the eighth day no pulse could be perceived at the wrist, although the heart's impulse was strong, and the sounds remarkably distinct. She continued in this condition for some days, during which time stimulants of every kind were freely resorted to; on the fifteenth day the surface being icy cold, but the heart still acting with vigour, while no evidence of organic disease could be found in the abdomen or head, I advised transfusion, which was performed by my colleague Mr. Smyly. About six ounces of recently drawn blood were injected into the median basilic vein; a slight reaction followed, and the breath, which had been cold for several days, became warm. The pulse, however, did not return, and she died three days after the operation.

On dissection no organic lesion of any kind could be discovered in any part of the body; the heart was firm, and its muscular structure natural; no obstruction existed in any artery, but the whole quantity of blood seemed much diminished; the consistence of the blood was somewhat pitchy, and its colour very dark. The wound in the arm was still gaping, and did not present the slightest appearance of adhesion or inflammation.

This was certainly a rare form of fever, but, nevertheless, it establishes the point, that without any mechanical obstruction, we may have in fever, absence of the pulse, while the heart continues to act with vigour, and the case is one out of several which go to establish the conclusion to which I think we must arrive, *that a vigorous action of the heart in typhus points out that stimulants will not have so beneficial effect as in the*

*opposite case.* I shall present other illustrations of this principle in the course of the paper.

I now recur to the division of cases of typhus into those with, and those without altered phenomena of the heart. In the first class we observe :

1. Diminution and ultimate cessation of the impulse.
2. Diminution of the intensity of the sounds.
3. Cessation of one of the sounds.

These phenomena, hitherto undescribed, are among the most interesting of those connected with the heart which I have ever observed, and I shall be able to shew that they have a most important application in practice, as bearing directly on the question as to the use of stimulants in typhous fever.

I shall now present a series of cases observed particularly with reference to the heart. They are so arranged as to shew first, the general symptoms; next, the phenomena of the heart and pulse; and lastly, the amount of stimulants employed.

**CASE II.**—*Severe Catarrhal Typhus; Failure of the Circulation; Cessation of the first Sound of the Heart; Use of Stimulants; Recovery.*

John Keefe, ætat. 20, of rather muscular frame, was admitted on the 11th of April, the seventh day of fever, with severe nervous symptoms, and all the signs, both vital and physical, of an intense bronchial affection, predominating in the left lung. The skin was thickly covered with bright red petechiæ, which were confluent, forming large patches on the arms and thighs; respirations twenty-eight, laboured; pulse 120, small and very weak.

The heart's impulse was visible, and the contractions audible, but the second sound greatly predominated over the first. It was loud and distinct, while the first was very feeble, particularly at the left side of the heart.



DATE.	GENERAL SYMPTOMS.	PHENOMENA OF CIRCULATION.	TREATMENT.
April 12.	Delirium; intense bronchial rales; insatiable thirst; diarrhœa.	Pulse 120, weaker than yesterday; impulse less perceptible; <i>first sound nearly inaudible</i> ; carotid pulsations of good strength; extremities warm.	Cupping; blister to the sternum; anodyne enema, and poultices to the belly.
„ 14.	Continual moaning; petechiæ more diffused, and dark coloured.	Pulse about 112; impulse barely perceptible; over the left cavities the first sound is scarcely distinguishable, while over the right it is more so; <i>second sound very clear.</i>	Wine 10 oz. arrow root, decoct. senegæ.
„ 15.	Countenance improved; much delirium; bronchitis lessened; diarrhœa continues; the marks of the cupping glasses are black.	Pulse 112, contracted and compressible; no impulse of the heart under the mamma; the first sound totally inaudible, second less distinct than yesterday; on the left margin of the sternum nothing can be heard but the second sound, and this feebly.	Wine 16oz. Blister to abdomen; anodyne enema; beef tca.
„ 16.	Looks better; slept well; diarrhœa less.	Pulse 108, stronger and fuller; first sound audible over the whole præcordial region, second more distinct.	Repeat all.
„ 17.		Pulse 100; respirations 28; impulse again perceptible.	Wine 12 oz.
„ 18.		Impulse still stronger, striking over a greater surface; both sounds distinctly audible at the inferior part of left side, and also to the right of the sternum; pulse 96; respirations 32.	Wine 12 oz.; jelly 2 glasses.
„ 19.	Bronchitis much less; petechiæ fading; bowels regular.	Pulse 76, full, of good strength; heart's impulse more vigorous; sounds as yesterday.	Wine 6 oz.
„ 20.		Pulse 88; phenomena of heart natural.	Wine 6 oz.
„ 21.		Ditto, ditto.	Wine 4 oz.
„ 23.	Convalescent. Patient discharged on 2nd May, perfectly well.		

In this case, and that which follows, we observe the remarkable and important peculiarity of the supervention of bad symptoms of prostration and putrescence at an unusually early period of the disease. This circumstance should always excite great apprehension, and lead to the exhibition of stimulants, notwithstanding the existence of various local irritations. In both these cases the chest and abdomen were severely engaged, and in both, the early exhibition of wine not only did no harm, but was productive of the happiest effects. The existence of signs of bronchitis or enteritis in our maculated fever does not necessarily contra-indicate the free and early use of stimulants.

In examining the efficacy of wine in typhus, if we compare the cases with predominance of enteric, and those with bronchial irritation, we generally find that in the latter group the stimulant is better borne, and there is a class of cases in which wine is scarcely admissible. These cases present signs of enteric irritation of great severity, alternating with violent nervous symptoms, unaccompanied by petechiæ, or other phenomena of putrescence. The use of wine is almost always injurious from its too violently exciting the brain. But in the bad petechial typhus with great prostration of strength, the existence of thirst, abdominal pain and tenderness, diarrhœa and tumefaction, should not prevent us from having recourse to wine.

I beg to draw the particular attention of my readers to the cardiac phenomena in this case; it may be right to state, that the stethoscopic observations in this and the succeeding cases were made with the greatest care.

We observed, in the first place, a progressively diminishing impulse; on the seventh day the impulse was visible at the side, but on the tenth was altogether wanting; it reappears on the twelfth, and continues to increase until the period of the patient's restoration to health.

In the second place, we find a singular modification of the sounds of the heart; the proportion between the two sounds

was lost on the seventh day, the first being exceedingly feeble, the second comparatively strong; on the eighth day the first sound was scarcely audible, and on the tenth it became extinct, and we had the singular phenomenon, never before observed, of the heart in typhous fever giving but a single sound. On the eleventh day, under the influence of powerful stimulation, the first sound reappears, and the second has more vigour; on the twelfth day both sounds are distinctly audible, and on the fourteenth the phenomena of the heart are natural.

We shall not here enter into speculations as to the cause of these phenomena, but proceed with a detail of facts.

CASE II.—*Severe maculated Fever, Delirium, Diminution of the first Sound of the Heart; Use of Wine in large Quantities; Recovery.*

Patrick Quin, æt. 20, was admitted on the 27th of February. It was stated that he had been ill but five days, but his appearance was that of a person after a much longer period of fever; he was collapsed, cold, and stupid, and covered with an abundant crop of dark livid maculæ; prostration extreme; eyes suffused; tongue covered with brown sordes; pulse 125, small and weak; heart's action feeble; respiration hurried. He was ordered 4 oz. of wine.

DATE.	GENERAL STATE.	PHENOMENA OF CIRCULATION.	TREATMENT.
Feb. 28.	Violent delirium during the night he is now in a state of collapse, lying on his back; constant jactitation; subsultus; cold extremities; retention of urine.	Pulse 132, soft, small, and variable; heart's impulse imperceptible; sounds defined; the pulsations in the carotids very feeble.	Wine 24 oz. blister to the head, turpentine enema.
March 1.	Slept well; in other respects is nearly the same, but is more easily roused; less suffusion of the eyes; considerable subsultus; he passed urine involuntarily.	Pulse 120, a shade stronger than yesterday; the <i>sounds of the heart are quite similar to those of the facial circulation.</i>	Wine 24 oz. turpentine enema.

DATE.	GENERAL STATE.	PHENOMENA OF CIRCULATION.	TREATMENT.
March 2.	Slept well ; tongue moist ; respirations 30 ; maculae fading ; extremities warm.	Pulse 130, fuller and stronger ; heart's action stronger, and sounds much louder—they approach to their natural character.	Wine 14 oz.
„ 3.	Violent delirium through the night ; skin hot ; bowels confined.	Pulse 104 ; heart's impulse stronger.	Wine 12 oz. enema.
„ 4.	No change ; great thirst.	Pulse 106.	Wine 16 oz.
„ 5.	Patient worse ; countenance more collapsed ; violent delirium ; picking of bed-clothes ; subsultus ; sighing ; contraction of the pupils ; incontinence of urine ; skin hot and dry ; mouth covered with black sordes.	Impulse of the heart plainly perceptible ; <i>second sound</i> much louder than the first ; pulse 120.	Wine 16 oz. Turpentine draught, with camphor, musk & opium mixture ; beef tea ; swathing with flannel.
„ 6.	Generally improved ; slept well ; much more sensible.	Pulse 106.	Wine 16 oz.
„ 7.	Complains of great thirst ; extremities warm ; maculae bright red, and less abundant ; pupils natural ; tongue moist.	First sound of heart much stronger ; pulse 96.	Wine 16 oz.
„ 8.	Great improvement ; desire for food ; skin cool.	Heart's action nearly natural ; second sound much improved ; the abdominal aorta can be felt throbbing with force.	Wine 16 oz. ; omit mixture.
„ 9.	Skin cool ; slept well.	Impulse of heart vigorous ; strong action, in the arteries of the neck and abdominal aorta ; pulse 88, strong and full.	Omit wine.
„ 12.	Convalescence perfect.	Sounds and impulse of heart natural ; pulse 72.	Full diet.

In this case, as in the one preceding, we observe the *early supervention* of bad symptoms, producing the same neces-

sity for early stimulation. Indeed it has rarely happened, that we were obliged to exhibit so large a quantity of wine on the fifth day of the disease, and I am convinced that nothing else would have saved the patient's life. It is impossible to lay down any rule, as to when the exhibition of wine should be commenced in our typhus, but the point must be regulated much less by the date of the fever, than by the actually existing condition of the patient. The circumstances which led to its exhibition on the fifth day were the great collapse, the livid colour of the petechiæ, the coldness of the extremities, and the feebleness of the heart; on the following day the symptoms pointed out the necessity of a great increase of the stimulants; the prostration was increased; the rapidity of the pulse augmented, *while the impulse of the heart had become imperceptible*. In two days after this a distinct improvement commenced. Yet, though phenomena of reaction shewed themselves, the wine was continued, though in diminished doses to the fourteenth day of the disease, and for the last three days its exhibition was combined with that of camphor, musk, and opium. The latter remedies were resorted to from the increase of the nervous symptoms on the eleventh day. The pulse on the day previous had been 106, it rose on the eleventh day to 120; it fell on the following day to its former standard, after which it gradually subsided to its natural rate.

In most cases in which wine is found to answer, the pulse comes down under its influence gradually and steadily; this I have before alluded to. In a few, however, we observe remarkable variations in the rapidity of the pulse. Of this the preceding case is an example; the increase of pulse, however, was met not by an augmentation of the wine, but by the exhibition of nervous medicines, which were productive of the happiest effect. Beef tea was also given, and the patient swathed with flannel, a measure of the greatest importance and value in the treatment of fevers with collapse, or with a tendency to bronchitis.

As connected with the rising of the pulse in typhus, the following rules with reference to the use of wine will be often found applicable :

1st. That the increase of rapidity is almost always an unfavourable symptom.

2nd. That when it occurs at an early period of the disease with a cool skin, and dark coloured eruption, it is to be met by an increase of wine.

3rd. That when it occurs in the latter period, accompanied by severe nervous symptoms, the patient using wine freely, we must carefully support the system, and exhibit, in conjunction with the wine, musk, camphor, and opium.

On the seventh day, in this case, the impulse and sounds of the heart were remarkably modified, the first was singularly diminished, and the sounds assumed characters closely resembling those of the foetal heart ; this modification is not very common in typhus. In most cases, one of the sounds is much more influenced than the other, the proportion between them is thus greatly altered, and there is no resemblance whatever to the sounds of the foetal circulation. But when there is a great diminution of the intensity of both sounds, and the pulsations vary from 125 to 135 in the minute, the sounds exactly simulate those of the foetal heart. In this instance the proportion between the sounds was lost on the eleventh day, the first being exceedingly feeble, the second comparatively louder ; this character disappeared on the thirteenth day, when the first sound regained its natural character, and it is a most interesting fact, that on the following day the second sound was observed to be exceedingly loud, while the abdominal aorta was throbbing with force.

I shall state the order of occurrence of the cardiac phenomena in this case.

1. Diminished impulse.
2. Impulse imperceptible.
3. Sounds of heart equally diminished (foetal character).

4. Impulse and sounds stronger.
5. Second sound proportionally louder than the first.
6. First sound stronger.
7. Sounds and impulse natural.

We shall hereafter show the importance of these observations, as bearing on the theory of the motions and sounds of the heart.

CASE III.—*Maculated Typhus; Absence of the first Sound of the Heart; extreme Slowness of the Pulse during Convalescence; Use of Wine in large Quantities; Recovery.*

Matthew Hickey, æt. 30, was admitted into hospital on the 15th of July, having had fever six days. Had been in the habit of drinking, but never to excess; he is the fifth of his family who has had severe maculated typhus; at present his countenance is much flushed; eyes suffused; maculæ abundant and of a bright red colour; tongue covered with a dirty brown fur, especially at the sides; great abdominal tenderness, particularly in the region of the liver. The chest, on percussion, yields a clear sound, and there are no stethoscopic indications of disease in either lung; the impulse of heart is not perceptible; although both sounds are audible, the second is heard to preponderate distinctly; pulse 124; respiration easy and natural; bowels free.

He was ordered

℞ Solut. Bicarb. Ammoniāe ʒ viii.

Acet. Morphiāe gr. ʒ.

Tinct. Hyosciam. ʒi.

Ft. Mist. Efferv. Capiat coch. amp. ii. tertiis horis.

DATE.	GENERAL SYMPTOMS.	PHENOMENA OF CIRCULATION.	TREATMENT.
July 16.	Slept well; bowels regular; tongue thickly coated and dry; convulsive respiration; skin pale and very clammy.	Impulse of the heart is quite imperceptible, even when he lies on the left side; to the <i>right of the left nipple the second sound alone is audible</i> ; pulse 120, rather feeble; on sitting up the impulse is not rendered more evident.	Wine 12 oz., blister over the heart, beef tea.
„ 17.	There is still some abdominal tenderness; slept pretty well; respirations 28; interrupted by frequent sighing, and partaking of the cerebral character. He got altogether yesterday 20 oz. of wine and a little brandy.	The impulse is felt at the apex, but the sounds are by no means in proportion to its vigour; they resemble those of the foetal heart; between the fifth and sixth ribs the sounds are barely audible.	Wine 24 oz., two glasses of brandy, arrow root, blister to the scalp; enca. emolliens.
„ 18.	Very restless; has not slept; frequently rises from his bed; passes water freely; tongue red at the edges, and covered in the centre with dark brown fur; teeth coated with black sordes; lies on his back in a semi-stupified state; countenance collapsed and pale; maculae very livid: respirations 32; on the back there are a few ecchymotic patches; abdominal tenderness continues.	The sounds of the heart very feeble; the first almost inaudible, the second is loud and clear, and at a point central between the nipple and sternum, this is much more marked; the impulse can only be felt when the fingers are placed between the intercostal spaces.	Wine 24 oz., poultices to the abdomen.
„ 19.	Skin cooler, moistened with perspiration; the respiration although laboured, has lost its cerebral character; the ecchymotic patches are fading; tongue cleaner; abdominal tenderness less; is more animated.	Pulse 116; impulse of heart the same as yesterday, the first sound is entirely absent, the second is distinct.	Wine 24 oz., blister and poultice to the epigastrium.
„ 20.	The countenance has lost the peculiar typhoid expression; the petechiae are fading; breathing still laboured.	Impulse of the heart quite imperceptible; the first sound is just audible; pulse 96.	Wine 18 oz.



DATE.	GENERAL SYMPTOMS.	PHENOMENA OF CIRCULATION.	TREATMENT.
July 21.	Passed a restless night; breathing much easier. He is quite sensible.	Pulse 80, and of good character; the sounds at the upper portion of the chest are proportionate but feeble; at the apex, and nearer the ensiform cartilage, the second sound still predominates.	Wine 12 oz.
„ 23.	Countenance more animated; skin cool; maculae almost gone; complains of thirst; passes large quantities of pale-coloured urine.	Pulse 76; impulse of the heart perceptible; sounds proportionate.	Wine 6 oz.; Haustus Rhei.
„ 24.		Pulse 76.	Wine 6 oz.
„ 26.	Sleeps well; appetite good; petechiae gone.	Pulse 60; of very good strength.	Wine 6 oz.
„ 28.		Pulse 56.	Wine 6 oz.
Aug. 1.	Is allowed to sit up during the day; is not fatigued; appetite very good.	Pulse 32; counted most carefully twice over.	Gets bread and milk.
„ 4.	Feels perfectly well.	He is sitting up in bed, and the pulse at this time is 32.	As yesterday.
„ 6.		He is now eating his breakfast: pulse at this moment 56.	
	Discharged in a few days.	Pulse 60.	

This case was one of extreme interest; the severity of the symptoms, the quantity of stimulants used, and the remarkable modifications of the heart's action, all combined to render the patient an object of the greatest attention to the class.

The diminution of the first sound of the heart was the circumstance which led to the exhibition of stimulants boldly, at an early period of the case. We observed that on the seventh day the impulse was imperceptible, and the first sound was

diminished. On the eighth, the first sound had disappeared, and although the other symptoms did not seem to call for active stimulation, we ordered wine in free doses from this indication alone, and the result justified the treatment. Here was a case of a young man of a good constitution, in which, from studying the action of the heart, we were able to anticipate the symptoms of general prostration, and by the early and bold use of wine, to prevent the fatal result which, it is almost certain, would otherwise have occurred.

The order of the succession of the cardiac phenomena in this case was peculiar. We had

1st. The early subsidence of the first sound.

2nd. Both sounds audible, but with the foetal character.

3rd. Predominance of the second sound.

4th. Complete absence of the first sound.

5th. Impulse imperceptible, with returning first sound.

6th. The sounds at the base of the heart proportionate, while at the apex the second predominates.

7th. The sounds natural.

The pulse, too, presents some interesting points for consideration. Within a period of twenty days its rate was as follows :

7th day of Fever . .	124
8th „ „ . .	120
11th „ „ . .	116
12th „ „ . .	96
13th „ „ . .	80
15th „ „ . .	76
17th „ „ . .	60
18th „ „ . .	50
22nd „ „ . .	32
27th „ „ . .	56

In a few days it rose to 60.

Laennec has suggested, that the rapidity of the pulse observed during the convalescence of fevers might depend on a softened condition of the heart. As I shall have occasion to notice his opinions on the state of the heart in typhous fever at greater length presently, I shall merely observe, that in those cases in which the pulse continued rapid during convalescence, the fever was seldom of the petechial or putrid character; and one of the most remarkable phenomena in our fevers during the last year, was the return of the pulse to its natural rate, even before the whole group of typhoid symptoms had disappeared; and so far from a quick pulse being common *during the convalescence* in cases which had shewn the signs of putridity, we found more frequently a singular slowness continuing for several days, until the patient was able to leave his bed.

CASE IV.—*Maculated Fever; great Feebleness of the Heart's Action; free Use of Wine; Convalescence on the seventeenth Day.*

Bryan Kean, æt. 24, of strong muscular development, was admitted on the 25th of March, having been then nine days ill: his countenance is dull, stupid, and of a livid hue; eyes heavy, and suffused; he is in a state of great stupor and prostration; decubitus on the back. Skin hot, dry, and covered with small livid petechiæ; tongue fissured, brown, and parched; has great thirst, and suffers much pain from pressure on the epigastrium; respirations 40, not laboured, and a few bronchitic rales can be heard in the left lung; the pulse 120, small and weak; the heart's impulse almost imperceptible, and the first sound so feeble as to be inaudible to the left of the mamma, but it can be distinguished between the mamma and sternum. Ten leeches were ordered to the epigastrium, turpentine enema, artificial heat to the extremities, and eight ounces of wine.

DATE.	GENERAL SYMPTOMS.	PHENOMENA OF CIRCULATION.	TREATMENT.
	<p>Slept well ; countenance more livid ; thirst insatiable ; teeth covered with sordes ; epigastrium less painful ; extremities perfectly livid and cold.</p> <p>Continued raving ; involuntary evacuations ; countenance improved ; extremities cold and livid.</p>	<p>Pulse 116, small and weak ; impulse of the heart quite imperceptible ; sounds are exceedingly feeble, they are almost inaudible below and to the left of the mamma, so that it is very difficult to distinguish between the first and second sounds, the sounds as it were running one into the other ; between the mamma and sternum they are stronger, and better defined ; the second is much clearer than the first. If the rapidity of the heart was a little increased, nothing could more closely resemble the fœtal circulation.</p> <p>Pulse 92, small, but distinct, stronger, and perfectly regular ; the action of the heart can be seen between the fifth and sixth ribs, but can scarcely be felt ; sounds of the left side remain as yesterday, those of the right are more distinct.</p>	<p>Wine 16 oz.</p> <p>Repeat wine.</p>
March 28.	<p>Continued low muttering delirium ; great prostration ; involuntary passage of urine ; extremities very cold, notwithstanding the use of artificial warmth ; petechiæ livid ; respirations 24 ; intelligence improved.</p>	<p>Pulse 84 ; impulse of heart less perceptible, but the first sound has more vigour.</p>	<p>Wine 16 oz., musk, camphor, and ammonia mixture ; two glasses of jelly.</p>
,, 29.	<p>Great improvement ; extremities warm ; petechiæ of red colour ; tongue cleaning ; slept well ; respirations 20.</p>	<p>Pulse 84, firmer and steadier ; when he lies on the left side the impulse of the heart is very perceptible, when on the back it is less so, but more evident to the touch than on yesterday ; sounds increased in strength and distinctness.</p>	<p>Wine 12 oz., omit mixture ; to have beef tea.</p>
,, 30.	<p>Improvement continues, but the lower extremities are liable to become cold</p>	<p>Pulse 72, fuller and stronger ; pulsations of the arteria innominata are distinctly vi-</p>	<p>Wine 8 oz., beef tea.</p>

DATE.	GENERAL SYMPTOMS.	PHENOMENA OF CIRCULATION.	TREATMENT.
April 1.	when the artificial heat is removed; the urgent thirst remains; tongue still brown. Convalescent.	sible at the top of the sternum; impulse of heart as before, but the sounds have improved in strength. Pulse 72, full and compressible; heart's sounds strong and natural.	Wine 4 oz., beef tea and chicken broth.
„ 2.	Do.	Do.	Omit wine.

We have here another case in which we were led to the use of wine on the ninth day of fever, almost wholly from the observation of the phenomena of the heart. Although the case had a generally bad aspect, yet I do not think that I would have been so bold in the exhibition of wine, had the patient been admitted before these researches had been commenced. There were many circumstances which seemed to contra-indicate wine: the patient was a young and robust man; his skin was hot and dry; his tongue brown and parched; he had extreme thirst, and great tenderness of the epigastrium. Some years ago I would not have dared to have given this man wine, from the apprehension of its increasing gastric inflammation. On the other hand, he had great prostration, and the petechiæ were of a livid hue; but it was on the cardiac signs that we relied; we had new and positive guides, and they did not deceive us.

I greatly doubt whether there is any symptom which we can depend on as indicative of gastric inflammation in petechial typhus. That the condition of the tongue is fallacious has been established by Andral and Louis from numerous dissections, and the utility of wine and other stimulants, when the tongue is dry and brown, gives another and different description of proof. In a paper on the use of wine and opium in fever, published by my colleague Dr. Graves in the first volume of

the Dublin Journal of Medical Science, he observes : " In the first place, as to the tongue, at an advanced period of fever, I have often derived the greatest advantage from wine and opium, although the tongue was dry, the colour of old mahogany, or else coated with a yellowish brown dry fur, and protruded with difficulty, while the teeth and gums were covered with sordes ; wine or porter, in moderate quantities, seem generally to agree with this tongue better than opium ; in some cases, however, the latter is indispensable. For fear of misleading the reader, I must again remark that I by no means wish to assert that such a tongue uniformly, or even frequently, indicates the use of these medicines : on the contrary, this state of the tongue and mouth will often be observed at a time when leeches and the antiphlogistic treatment are required. Let it be clearly understood, however, that at an advanced period of fever this state of tongue may exist, and yet wine and opium may be given boldly, provided, as I have said before, the general state of the patient seems to require it."

Let it be recollected, that in this case we had the symptoms of a dry and brown tongue, great thirst, epigastric tenderness, and heat of skin. On the first day of treatment leeches were applied to the epigastrium, and wine exhibited to the amount of eight ounces. I have frequently leeched the epigastrium, and ordered wine on the same day, and with benefit. In our case the epigastric tenderness was lessened, but the thirst continued insatiable : the quantity of wine was doubled. Two circumstances led to this, one the extreme coldness and lividity of the extremities ; and the other, the increasing indications of debility of the heart, as shewn by the great indistinctness of the first sound, and the approach of the stethoscopic phenomena to what we term *the fœtal character*.

On the third day of the use of wine, and eleventh of the disease, the pulse fell from 116 to 92, and the first sound began to recover its natural intensity : this change was first *perceived over the right cavities of the heart*. This curious fact I have

repeatedly observed, and I think it may be stated, that in all cases in which the first sound is lessened or obliterated, the return to the natural character is first perceived over the right side of the heart. Whatever be the cause of these interesting phenomena, it seems much more to engage the arterial than the venous side of the heart.

CASE V.—*Maculated Typhus, with Diminution of the first Sound of the Heart; Use of Wine and Brandy.*

John Smyth was admitted into the Meath Hospital on the 19th May; the tenth day of his fever. He is a strong, powerful man; has been accustomed to drink ardent spirits, but was not very frequently intoxicated; at present is very low: he was last night constantly getting out of bed; passes his water under him; the petechial eruption is thickly diffused over his body; tongue dry, and red in the centre; intellect this morning clear; pulse 124, very small, and easily compressed; the impulse of heart feebly perceptible; the first sound very indistinct, the second clear; above the mamma the first sound is scarcely audible. Ordered wine  $\bar{3}$  viii.

DATE.	GENERAL SYMPTOMS.	PHENOMENA OF CIRCULATION.	TREATMENT.
May 20.	Passed a good night, did not rave; respirations 36; retention of urinc; extremities cold.	Impulse of the heart imperceptible, second sound predominates over the first; pulse 124.	Wine 12 oz., glass of hot brandy punch.
„ 21.	Slept well, no raving; petechial eruption livid; eyes suffused; respirations 36; tongue cleaner; retention of urine continues, requiring frequent use of the catheter; bowels regular; bronchitis very acute.	Pulse 112; the impulse of the heart is perceptible when he lies on his left side; the second sound predominates considerably over the first.	Wine 12 oz., dry cupping to chest extensively; blisters to the region of the heart.
„ 22.	Had some sleep, no raving; countenance improved; eyes less suffused.	Pulse 100, full and regular, <i>whereas before the additional quantity of wine given</i>	Wine 20 oz. In consequence of his low state

DATE.	GENERAL SYMPTOMS.	PHENOMENA OF CIRCULATION.	TREATMENT.
		<i>yesterday it was intermitting; sounds of heart feeble, second still predominates.</i>	he was given 8 oz. of wine additional yesterday; beef tea one pint; pulv. ipecac. gr. $\frac{1}{2}$ ; ammon. carb. gr. ii., ft. pil. terdie sumend.
May 23.	Passes his urine and fæces under him; respirations 32, not so labour'd; extremities warmed by artificial heat; great prostration.	Pulse 84, small; the impulse of the heart is more distinct to-day; the first sound is still below par.	Wine 20 oz., beef tea 1 pt., jelly, a glass; blisters over the heart and nape of neck.
" 24.	Countenance much improved; slept well; when he is raised in bed, he complains of lightness of his head; bronchitis considerably better.	Pulse 80; impulse of heart perceptible, the first sound is stronger.	Wine 20 oz.
" 25.	Passes his urine freely; had a quiet night; is much better.	Pulse 80, very good strength; impulse of the heart natural, sounds proportionate.	Wine 16 oz.
" 26.	Scarcely any cough; sleeps well.	Pulse 70, regular; phenomena of heart as in last report.	Wine 16 oz.
" 27.	Sat up yesterday; is still a little nervous.	Pulse 72.	Wine 6 oz.
" 28.		Pulse 72; sounds and impulse of heart perfectly natural.	Wine 6 oz.
" 29.	Convalescent.		

CASE VI.—*Maculated Fever, with severe Gastro-Catarrhal and Nervous Symptoms; remarkable Modification of the Heart's Action; Use of Wine.*

Thomas Cavanagh, æt. 15, was admitted on the 14th of April, being then three days ill: he had a few indistinct pale



spots on the back ; excessive thirst ; diarrhœa, and tenderness of the epigastrium ; there was slight cough, with abundant frothy mucous expectoration. Pulse 120, small, and easily compressed ; but the impulse of the heart is strong, and the sounds distinctly heard over a large portion of the chest. The epigastrium was leeched, and effervescing draughts ordered.

DATE.	GENERAL SYMPTOMS.	PHENOMENA OF CIRCULATION.	TREATMENT.
April 16.	General symptoms continue ; respirations 32.	Pulse 126 ; impulse of heart not so strong.	Four leeches to the epigastrium ; cne-ma emollicens.
„ 17.	Maculæ more distinct ; the abdominal symptoms continue ; respirations 36 ; some delirium.	Pulse 120, weaker ; impulse of the heart scarcely visible, but is quite perceptible to the touch ; sounds are natural.	Hip bath ; poultice to the abdomen.
„ 18.	Copious sweating after the bath ; he is worse this morning ; constant low delirium ; countenance pale and depressed ; less heat of skin ; maculæ abundant, and becoming livid ; tongue dry, brown ; great thirst ; considerable tenderness in the ileo-cæcal region.	Pulse 132, still weaker ; impulse of heart can be seen and felt ; the sounds are exceedingly weak, <i>particularly the first, which is scarcely audible.</i>	Eight leeches to the abdomen ; small doses of hydrarg. c. creta and Dover's powders.
„ 19.	Debility increased ; skin hot and dry ; petechiæ universally abundant, and of a dark livid hue ; respirations 30, less laboured ; great thirst.	The sounds of the heart exactly resemble those of the fœtus at the eighth month ; an exceedingly indistinct impulse can be felt at the end of expiration.	Wine 3 oz. ; arrow root.
„ 20.	Slept better, less raving ; countenance improved ; eyes less suffused ; abdominal symptoms continue ; respirations 28, interrupted by frequent sighing ; sonorous and sibilous rales in posterior portion of the chest ; two small gangrenous spots on the left ear.	Pulse 140, slightly improved in strength ; impulse of heart more perceptible, and its sounds can be heard to the right of the sternum.	Wine 3 oz. ; arrow root.

DATE.	GENERAL SYMPTOMS.	PHENOMENA OF CIRCULATION.	TREATMENT.
April 21.	Slept well, and is more collected ; complains of extreme thirst ; respirations 32 ; skin hot and dry ; maculæ unusually abundant, and livid ; one of the ecchymosed spots on the ear has vesicated ; extremities warm.	Pulse 132, fuller, more firm ; impulse of heart as yesterday, but the sounds to the right of sternum are not so distinct, particularly the first, which is remarkably feeble.	Wine 5 oz.
„ 22.	Symptoms as before ; respirations 40.	Pulse 125 ; no change in the heart.	Wine 5 oz. ; repeat rest.
„ 23.	Raving continues ; skin cooler ; maculæ not so livid ; cough worse, with much stuffing.	Pulse 135. When he lies on the left side, the impulse of the heart is strong, first sound more distinct.	Wine 5 oz. ; fetid enema.
„ 24.	The typhoid expression quite gone ; eye clear and sprightly.	Pulse 110, soft and much improved ; impulse and sounds still stronger.	Wine 5 oz. ; Ipecac. and carb. ammonia in pills.
	Convalescent.		

The two preceding cases exhibit still the same phenomena, the diminution of the impulse of the heart and of its sounds, particularly the first. In the case of Cavanagh, we observed the change from the natural to the morbid condition, for the patient was admitted at an unusually early period of fever. In that of Smith, the first sound of the heart was altered on admission. In bad cases, the alteration of the sounds may be expected on or about the fifth day. The change does not seem to be accompanied by any peculiar disturbance of the circulation. *We have as yet recorded no evidences, physical or vital, of a local irritation accompanying or preceding the diminution of the first sound ;* and our dissections and those of Louis agree as to the absence of the usual appearances of carditis.

In the case of Smyth, the quantity of wine employed was much greater than in that of Cavanagh ; for this there were

several reasons : the greater age of the patient, and his having been addicted to ardent spirits being the principal : besides, we could not tell how long the morbid condition of the heart had existed before admission ; and it was acting on the safe side to assume that it had continued for several days, a circumstance which would indicate great activity in stimulation.

In the fevers of children, and of persons but a few years beyond puberty, the necessity for the use of wine is seldom so urgent as in those beyond twenty, or twenty-five ; but we have had several cases of maculated typhus in children, with such prostration as to demand a free use of wine, which had the best effect, notwithstanding the existence of what we consider local inflammations.

CASE VII.—*Maculated Fever ; with signs of Bronchitis and Enteritis ; Purulent Discharge from the Nose ; great Prostration ; Use of Wine ; Recovery.*

Henrietta Wright, æt. 13, was admitted on the 9th April, after having been in fever upwards of a fortnight ; her countenance was collapsed ; the face livid ; nocturnal delirium ; violent headach, with a copious purulent discharge from the nostrils ; extreme thirst ; she was constantly sobbing and moaning ; skin hot, and covered with an abundant crop of small livid maculæ. Intense bronchitis, unaccompanied by expectoration ; complains of pain on pressure of the epigastric region ; pulse 120, exceedingly feeble ; impulse of heart extremely weak, and more distinct with the second than the first sound ; the second sound is very clear, the first scarcely audible ; it is more distinct over the right than the left side. Ordered, wine 4 oz., blister over the epigastrium, and Ipecac. and Pil. Hydrarg. four times in the day.

DATE.	GENERAL SYMPTOMS.	PHENOMENA OF CIRCULATION.	TREATMENT.
April 11.	Low muttering delirium ; eyes suffused ; countenance depressed ; tenderness of epigastrium increased : pain referred chiefly to forehead ; mucous expectoration, with troublesome cough ; bowels not opened since yesterday ; respirations 46, hurried.	Pulse 125, very feeble ; impulse of the heart as yesterday ; first sound improved.	Wine 4 oz. : blisters to the head and legs ; ice to the temples ; turpentine enema ; arrow root ; barm.
,, 12.	General improvement at 4 o'clock P. M. ; yesterday her pulse was imperceptible, and extremities cold. Bronchial rales intense over the whole chest ; discharge from the nose less profuse ; cough troublesome ; expectoration copious.	Pulse 120, stronger and fuller ; sounds of the heart are more distinct ; impulse can be felt.	Wine 4 oz. ; chicken broth ; flannel waistcoat.
,, 13.	No improvement ; constant sobbing ; headach ; abdomen hard, full, and very tender ; bronchitis continues intense and general ; respirations 48.	Pulse 110 ; heart's action more vigorous.	Wine 4 oz. Blister between shoulders ; poultice to the belly ; chicken broth.
,, 14.	The catarrhal and nervous symptoms continue ; she is continually turning up her eyes ; respirations 40, convulsive and hurried, accompanied with sobbing ; abdomen exquisitely tender ; face more livid.	Pulse 105, stronger than yesterday ; impulse can be felt, but the sounds are masked by the bronchial rales.	Repeat cataplasm. abdom.
,, 15.	She is much improved, maculae indistinct ; abdomen still very tender ; secretion from the nose has ceased ; respirations 40.	Pulse 110.	Repeat all.
,, 16.	Improvement continues ; abdominal tenderness nearly gone ; lividity has disappear-	Pulse 108 ; impulse and sounds more distinct.	Wine 4 oz. ; antimonial solution.

DATE.	GENERAL SYMPTOMS.	PHENOMENA OF CIRCULATION.	TREATMENT.
	ed; respirations 56, yet not laborious; musical and cre-pitating rales predominating in left lung, which is clear on percussion.		
April 17.	General improvement; res-pirations 55; <i>perfectly easy</i> .	Pulse 84, soft and full.	Wine as be-fore.
„ 21.	Complete convalescence.	Pulse 56.	Do. do.

In this case, the circumstances which might seem to contra-indicate the exhibition of wine were, that the patient was not yet arrived at the age of puberty, the heat of the skin, and the violent symptoms of abdominal and thoracic irritation. On the other hand, she had been upwards of a fortnight ill; had a collapsed countenance; the petechiæ were livid, and the first sound of the heart scarcely audible. To these indications must be added that of the purulent discharge from the nose, a symptom not by any means common, but one which doubtless pointed out a necessity for stimulation. I have seen this symptom in but two cases of typhous fever; it is a very peculiar, and in my opinion, alarming one. The pus runs from the nostrils in a copious and continued stream; the nose is somewhat swelled, and the patient lying on the back, and in extreme prostration, presents a close resemblance to an individual labouring under glanders.

It will be observed that on the 16th of April the antimonial solution was ordered: this was done with the view of relieving the bronchial irritation; its exhibition, however, at this advanced period of the case involves a point of practice of great importance, namely that in certain cases the typhoid symptoms prevent us employing an antiphlogistic treatment for many days; a change then takes place, and the patient will bear a reducing treatment for the relief of local disease, which before would

have been dangerous: to this I shall hereafter return. It will be seen, in the case under consideration, that while the anti-mony was ordered the wine was not discontinued.

Great advantage was obtained by poulticing the abdomen in this case; I have the greatest reliance on this treatment in the secondary abdominal irritations of fever. It was, I believe, first recommended by Broussais. It is particularly advantageous where the weakness of the patient forbids the use of leeches.

In the same class of cases, my friend Dr. Lees has treated a great number of patients by the use of the hip bath. For the success of this treatment, in many of his cases, I can vouch; and to his judgment, in the management of the remedy, I can bear full testimony.

CASE VIII.—*Petechial Fever, with Bronchitis; Diminution of the First Sound of the Heart; Use of Wine; Recovery.*

Thomas Wallace, admitted on 10th May, eleventh day of his fever, complaining of intense headach; general eruption of petechiæ; the sounds of the heart were feeble, but proportionate; impulse imperceptible; pulse 98, full but easily compressed. Ordered wine 8 oz., Mist. Camph. c. Carb. Ammon.

DATE.	GENERAL SYMPTOMS.	PHENOMENA OF CIRCULATION.	TREATMENT.
May 11.	Pupils contracted; countenance flushed; decided bronchitic rales.	Impulse of heart just perceptible; the sounds are acquiring the fœtal character: between the fourth and fifth intercostal spaces scarcely anything is heard but the second sound; pulse 92.	Continue wine and mixture; cupping, and blister to the chest.
„ 12.	The bronchitis more severe, but the countenance has a better expression.	The first sound is more distinct; at the mamma both sounds can be heard, although feebly; pulse 84.	Wine 12 oz., Decoct. Senegæ, et Carb. Ammon.; dry cupping between the shoulders.

DATE.	GENERAL SYMPTOMS.	PHENOMENA OF CIRCULATION.	TREATMENT.
May 13.	Bronchitis continues.	Both sounds are now distinctly audible under the mamma and below the sternum.	Wine 8 oz. ; rept. alia.
„ 14.	Slept well ; some aphonia, with tenderness of the trachea on pressure ; countenance flushed.	The impulse of heart just perceptible ; sounds distinct, still feeble ; pulse 92.	Wine 8 oz. Blister to throat.
„ 15.	Bronchitis less : passed a good night.	Both sounds of the heart are proportionate ; pulse 82.	Wine 6 oz.
„ 16.	Bronchitis subsiding in the right lung, but engaging the minute tubes of the left to a considerable extent.	Both sounds proportionate and distinct ; pulse 88.	Wine 6 oz.
„ 21.		Impulse of the heart perceptible ; the sounds natural ; pulse 60.	Dry cupping ; senega mixture, with antimony.
„ 24.	On this day he was pronounced convalescent.		

CASE IX.—*Petechial Fever ; Diminution and Temporary Alteration of the first Sound of the Heart ; Recovery.*

Thomas Devereux admitted into hospital on the 23rd of May ; the eight day of fever. Petechiæ plentiful, but of healthy colour ; respirations hurried ; complains of cough, which is accompanied with a frothy mucous expectoration ; bronchitic rales are only heard in the upper portion of the right lung,—is very low ; pressure on the abdomen gives pain ; great thirst : the impulse of the heart is scarcely perceptible ; the sounds are proportionate, but feeble ; pulse 112. Ordered six leeches to the epigastrium ; castor oil 3 oz., in emulsion, with tinct. opii *m*iii.

DATE.	GENERAL SYMPTOMS.	PHENOMENA OF CIRCULATION.	TREATMENT.
May 24.	Complained of intense headach yesterday evening, which was relieved by epistaxis; bronchitic rales very intense; breathing laboured; respirations 40.	Sounds of the heart are feebler than yesterday; pulse 116, fuller and stronger.	Wine 6 oz.; cupping to 8 oz.; emp. lytæ over the heart.
,, 25.	Bronchitic rales not so intense; respirations 48; countenance more animated; abdominal tenderness completely gone; had slight epistaxis yesterday evening; some headach.	Pulse 108; sounds of the heart somewhat louder over the apex; impulse perceptible.	Omit wine; leeches to the temples.
,, 26.	Three leeches were applied, and gave great relief; respirations 48; slept well.	The pulse taken early in the morning was 108; later in the day 116: the sounds of the left cavities of the heart are exceedingly feeble, <i>at the apex the first sound can be distinguished, but at the mamma only the second is heard</i> ; the superiority of the second over the first is also perceived over the right cavities; impulse just perceptible.	Mist. effervcs.
,, 27.	Slept well; bronchitis better; complains of stuffing in his head; countenance to-day is more flushed; had slight epistaxis yesterday evening; respirations 44.	Pulse 100, soft and compressible; impulse of the heart perceptible; the sounds are feeble, the second still predominates over the first.	Omit mixture; porter a pint; arrow root diet.
,, 28.	Had slight epistaxis yesterday evening; slept well.	The sounds of heart are yet feeble, the second predominating over the first; pulse 96, good strength.	Senega mixture.
,, 29.	Respirations 28, easy; no headach; slept well.	Sounds to the left of mamma very weak, <i>distinct however; much stronger to the right.</i>	Continue.
,, 30.	Respirations 28; tongue clean and moist; skin cool; slept well countenance improved; still has slight bronchitis.	Pulse 76, soft; phenomena of the heart as before.	Continue; porter one pt.



DATE.	GENERAL SYMPTOMS.	PHENOMENA OF CIRCULATION.	TREATMENT.
May 31.	Much improved.	Impulse of heart perceptible ; the sounds over the left cavities are stronger, the two sounds being now proportionate.	Porter one pt.
June 1.		Pulse 60, natural ; the sounds of the heart are stronger ; impulse perceptible.	Porter and beef tea.
„ 8.	Convalescent.		

CASE X.—*Petechial Fever ; Supervention of Signs of Bronchitis on the twelfth Day ; slight Change in the Phenomena of the Heart ; moderate Use of Wine ; Recovery.*

Rose Devereux, admitted on the 23rd June ; eight days ill ; at present complains of great pain and soreness in all her limbs ; headach ; pressure on the abdomen gives pain, especially in the epigastrium and hepatic region ; no bronchitis ; both sounds of the heart are natural ; impulse perceptible ; pulse 100, feeble ; on being made to sit up in bed, she is obliged to cling for support to the bed-side, in consequence of a feeling of lightness in her head, and dimness of sight ; respiration easy ; tongue clean ; no petechiæ.

Hirudines x. Epigastrio. Haustus Efferves.

DATE.	GENERAL SYMPTOMS.	PHENOMENA OF CIRCULATION.	TREATMENT.
June 25.	Intense headach ; great thirst ; nausea and retching whenever she attempts to sit up ; no abdominal tenderness ; bowels costive ; respirations 40.	Pulse 112, compressible ; both sounds of the heart are proportionate ; impulse perceptible.	Tart. pot. ass. et Soda, $\frac{1}{2}$ oz. enema purgans.
„ 26.	Slept well ; no headach ; slight epistaxis yesterday evening ; bowels free ; no bronchitis or cough.	Pulse 116 ; impulse perceptible ; both sounds of the heart are natural and proportionate.	Milk whey.

DATE.	GENERAL SYMPTOMS.	PHENOMENA OF CIRCULATION.	TREATMENT.
June 29.	Yesterday evening complained of great oppression in her breathing; on percussion the chest was clear, <i>but a most intense bronchitis engaged the whole of left lung</i> ; did not sleep last night; countenance anxious; constant nausea; some cough; sputa viscid; bowels free; respirations 36.	The sounds of the heart are much obscured this morning in consequence of the intensity of bronchitis; they are, however, sufficiently clear to enable us to determine that they are proportionate; impulse perceptible; pulse 124.	Cupped freely yesterday evening. Pil. hydrarg. gr. iii., pulv. Ipecac. comp. gr. ii., fl. pil. quater in die sumend.
„ 30.	Passed a tolerable night; cough not very troublesome; tongue slightly furred; skin cooler; bronchitis in both lungs; respirations 40; bowels regular; had some vomiting yesterday evening, of a greenish fluid; nausea continues.	Pulse 124; impulse of the heart quite imperceptible; sounds hurried, feeble, but proportionate.	Repeat pill.
July 1.	Vomiting last night; the fluid thrown off the stomach is of a dirty green colour, the consistence of treacle; no headach; complains of great oppression in her chest; bronchitic rales are not so intense; petechiæ abundant.	Pulse 120; impulse imperceptible; sounds very feeble, but proportionate.	Wine 6 oz.; repeat pill.
„ 2.	Bronchitis much better; she breathes very easily; vomiting this morning; skin cool; petechiæ paler than yesterday.	Pulse 96, feeble; no impulse to be felt; sounds stronger than yesterday.	Wine 6 oz.; omit pills.
„ 3.	Very much improved; slept well last night; complains of thirst; no headach; respirations natural.	Pulse 76.	Wine as before.
„ 4.	Countenance much improved; no headach; scarcely any bronchitis; respirations natural.	Pulse 76; sounds proportionate, but the impulse cannot yet be felt.	Continue treatment.
„ 5.	As yesterday.	Pulse 60, tolerable strength; impulse of the heart is just perceptible.	Repeat all.

DATE.	GENERAL SYMPTOMS.	PHENOMENA OF CIRCULATION.	TREATMENT.
July 6.	Sat up in bed the greater part of yesterday without any inconvenience; appetite very good.	Pulse 60; impulse of the heart is perceptible; sounds proportionate.	Repeat.
" 7.	Convalescent.  In a few days was discharged cured.	Pulse 60; of good strength.	Continue wine 6 oz.

In the three preceding cases a general similarity may be observed: in all there was the petechial eruption, and the signs of bronchitis existed at some period of the cases respectively. In the two first, those of Wallace and Thomas Devereux, we had the peculiar phenomena of the heart well marked; while in the third—they were so slightly manifested, that it is difficult to say whether the patient really had any positive affection of the heart. It is remarkable, accordingly, that the necessity for the use of wine was by no means so great in her case. Indeed the quantity of wine employed in the female wards is greatly less than in the male; the phenomena of putrescence being much more often manifested in the male subject.

In the case of her brother Thomas Devereux, the diminution of the first sound was most remarkable. The case illustrates some curious points.

In the first place it shows how little we can judge of the actual condition of the heart by the examination of the pulse. On the ninth day the pulse had increased in frequency, volume, and strength; and yet the sounds were more feeble than on the day before. I have shown that we may have a vigorous heart with a feeble pulse, or even absence of pulse, and here we have the converse of the proposition. The sounds of the heart became more feeble while the pulse was stronger. Indeed we could never determine from the pulse whether or not the phe-

nomena of the heart were altered, and the fact is, that it is by the physical signs, and the application of the hand alone, that we can ascertain how far the heart is affected in typhous fever. In this case, however, the fulness and increased strength of the pulse preceded a certain degree of reaction; for on the next day the sounds were louder, the countenance more animated, and there was headach: we then omitted the wine. The excitement, however, was but temporary, for in twenty-four hours *the first sound was completely lost at the mamma.*

We sometimes meet with cases in which stimulation is necessary, yet the patients do not bear wine well. In such cases I exhibit porter, which answers well.

CASE XI.—*Petechial Typhus, with Diarrhœa and Bronchitis; Cessation of the first Sound of the Heart; Exhibition of Wine delayed till the twelfth Day; Return of the first Sound on the fourteenth; Recovery.*

John M'Kone was admitted on the 1st May, on the eighth day of his fever; there is no petechial eruption; complains of troublesome cough; bronchial rales in both lungs; tongue covered with a brown crust; the impulse of the heart *is perceptible; the first sound* is almost inaudible, the second is perfectly distinct; pulse small, 120.

Pil. Hydrarg. gr. iii. Pulv. Doveri, gr. ii. ter die sumend.

DATE.	GENERAL SYMPTOMS.	PHENOMENA OF CIRCULATION.	TREATMENT.
May 2.	Raved during the night; got some sleep towards morning; seems much depressed.	Pulse 120, small and quick; impulse of heart is still perceptible; the second sound predominates considerably over the first.	Repeat medicine.
„ 3.	Passed a much quieter night than the last; raved a good deal towards morning; tongue very much furred; great thirst; bronchitis continues; maculæ are now very plentiful; headach.	Pulse 120, and fuller; impulse scarcely perceptible.	Ext. hyoscyam. gr. iii., pulv. Ipecac. gr. ss., tertiis horis sumend.

DATE.	GENERAL SYMPTOMS.	PHENOMENA OF CIRCULATION.	TREATMENT.
May 4.	Raved much less last night; no headach; eyes suffused; countenance rather flushed.	Pulse 120; the first sound of the heart is almost lost; the second is distinct.	Beef tea.
" 5.	The petechiæ are not more livid, nor are they paler; some purging yesterday and to-day.	Pulse 124, easily compressed; <i>the double character of the sounds of the heart is now completely lost; the second alone being audible; the impulse is not to be felt.</i>	Wine 10 oz. chalk and opium mixture
" 6.	Has passed a great many bloody stools; much delirium; his countenance, however, is not expressive of great depression; rest broken by being obliged to leave his bed; petechiæ have faded considerably.	Pulse 112; the sounds and impulse as yesterday.	Wine 10 oz.; repeat mixture; beef-tea.
" 7.	Was exceedingly delirious the whole night, so much so as to render the strait-waistcoat necessary; has passed three motions not bloody: <i>sub-sultus tendinum.</i>	Pulse 92; the impulse is yet imperceptible; <i>the first sound is again audible to day; the second distinct and clear.</i>	Wine 10 oz.; draught of muriate of morphia; beef tea
" 8.	Did not rave at all; slept almost the whole night; countenance much more animated; speaks quite rationally; bowels moved twice, <i>æcæ</i> s assuming their natural form; tongue cleaning and moist; but little thirst; <i>he did not get the morphia; petechiæ quite gone.</i>	Pulse 80, of good strength; the impulse is perceptible; the first sound stronger today, giving less predominance to the second.	Wine 5 oz.; arrow root diet.
" 9.	Slept very well; did not rave; says he could eat a bit of bread if he had it; bowels much improved; two motions yesterday; is much better.	Pulse 80, and of good strength; impulse perceptible; there is very little difference between the sounds of the heart.	Continue wine 5 oz.
" 13.	Convalescent.	Pulse 76, natural.	Has had wine 5 oz., and beef-tea daily since last report.

This case is principally interesting from the complete disappearance of the first sound of the heart for at least forty-

eight hours ; the coming down of the pulse under wine preceded the return of the first sound and the impulse : throughout the whole of this case the second sound continued remarkably clear.

The exhibition of wine was delayed too long in this case ; we were misled by the absence of petechiæ on the eighth day ; they did not appear till the tenth day, an unusually late period.

The next case is remarkable for its presenting the peculiar cardiac phenomena in fever, with a singular slowness of the pulse during the disease, and also in the convalescence.

*CASE XII.—Maculated Fever, with Bronchitis ; Feebleness of the first Sound ; Slowness of Pulse ; free Use of Wine ; Recovery.*

Richard Edwards, æt. 26 ; admitted into hospital on 8th June, ten days ill ; the petechiæ are very plentiful and of healthy colour ; countenance much depressed ; tongue very thickly coated ; great thirst ; did not sleep well last night, but was continually raving ; complains of irritation in his throat, which is not inflamed ; great oppression in his breathing ; acute bronchitis in left lung ; cough troublesome ; expectoration viscid ; abdomen full and tympanitic, but without pain on pressure ; impulse of the heart is perceptible ; the sounds are very weak, and the second predominates over the first ; pulse 84, feeble ; bowels free ; respirations 48. To be cupped freely between the shoulders ; blister to the sternum ; senega mixture, wine viii. oz.

DATE.	GENERAL SYMPTOMS.	PHENOMENA OF CIRCULATION.	TREATMENT.
June 10.	Raved a good deal last night ; countenance anxious ; conjunctivæ infected ; tongue much coated ; no headach ; cough not very troublesome ; expectoration viscid and scanty ; Respirations 48 ; bronchi-	Pulse 80, small and compressible ; the first sound of the heart is so feeble as to be almost inaudible ; the second is very clear ; impulse just perceptible.	Wine 24 oz. ; repeat mixture ; blister over the heart in the evening, if necessary.

DATE.	GENERAL SYMPTOMS.	PHENOMENA OF CIRCULATION.	TREATMENT.
June 11.	tis in both lungs ; more severe in the left ; bowels rather too free ; evacuations thin and watery ; extremities warm.  Passed a good night ; the blister was applied yesterday evening ; is very weak this morning ; countenance expressive of great anxiety ; tongue coated ; breathes easier ; coughs less ; expectoration profuse and thick ; respirations 40 ; is not purged, but passed 2 thin watery stools.	Pulse 80, feeble ; we could not examine the state of the heart in consequence of the blistered surface being very painful.	Wine 24 oz. ; repeat mixture.
„ 12.	Countenance much improved this morning ; breathes easily ; bronchitis better ; did not rave ; bowels moved three times ; character of stools somewhat better ; respirations 36 ; expectoration not so profuse ; coughs much less.	Pulse 80, feeble ; the impulse of the heart is perceptible ; the second sound is still loudest.	Wine 16 oz. ; repeat mixture.
„ 13.	Countenance considerably improved, and he is much better this morning in every respect ; sputa profuse again to-day ; does not complain of much thirst ; respirations 26.	Pulse 80, and fuller ; impulse and sounds as last report.	Wine 12 oz.
„ 14.	Slept very well ; petechiæ fading ; tongue cleaning and moist ; bronchitis much better.	Pulse 68, and of good strength ; impulse of heart perceptible ; sounds improving ; the second yet predominates.	Wine 12 oz.
„ 15.	Countenance more animated ; voice stronger ; very little expectoration ; bronchitic rales are still loud ; bowels regular ; no petechiæ.	Pulse 60, soft and compressible ; the first sound of the heart much improved in strength, giving little predominance to the second.	Wine 12 oz. ; bark mixture.
„ 16.	Bronchitis rapidly improving ; respirations natural ; converses rationally.	Pulse 60 ; impulse of heart very feeble ; the 2nd sound still predominates.	Wine 6 oz.

DATE.	GENERAL SYMPTOMS.	PHENOMENA OF CIRCULATION.	TREATMENT.
June 17.	Expectoration is scanty, and tinged slightly with blood; on carefully examining the chest, no signs of pneumonia can be discovered; and the bronchitis is much less intense.	Pulse 54, stronger; impulse and sounds as last report.	Wine 6 oz.
„ 18.	Sputa free from admixture with blood; is considerably better; appetite good.	Pulse 56, regular; impulse perceptible; and the sounds of the heart are once more proportionate.	Wine 6 oz.
„ 19.	Passed a very good night; tongue clean; no cough; bowels regular; skin cool.	Pulse 52; strong; phenomena of heart natural.	Wine 6 oz.
„ 20.	As last report.	Pulse 46, and strong.	Wine 6 oz.
„ 21.	Quite convalescent.	Pulse 44, and of exceedingly good strength.	Wine 6 oz.
„ 22.	He was out of bed for the greater part of yesterday, and bore the exertion well.	Pulse 44; on walking across the ward and back again, the pulse rose to 60.	Mutton chop.

We have now recorded two cases, in which the phenomena in question coincided with a very slow action of the heart, and in which the pulse during convalescence became singularly diminished in frequency. To this I would particularly direct the attention of my readers, as it bears on a very important practical point, namely, the cause of the anomalous conditions of the pulse in the convalescence of fevers.

In my remarks on the third case, (see page 19,) I have alluded to the opinion of Laennec, who, after describing the softened state of the heart in putrid fevers, inquires whether this condition could account for the frequency of pulse which exists, sometimes for several weeks, in convalescence from fevers, although the patient continues to regain flesh and vigour.\*

\* Laennec, Art. Softening of the Heart.—See Dr. Forbes' Translation.



If the phenomena now described are connected with a softened state of the heart, it will appear that our experience in this matter is opposed to the idea above quoted. It will be observed that in most of the cases the pulse came down to its ordinary rate, and did not exhibit any unusual frequency during convalescence; and that in several, and in two particularly, the pulse in convalescence fell far below its usual standard. And with respect to the frequency of pulse in convalescence, alluded to by Laennec, my experience at present is, that it is more likely to occur after fevers of a *non-putrid* character; and that it often points out the existence of some local irritation, or a tendency to it. Future observations must settle this point.

I might add several other cases presenting analogous phenomena, but refrain from doing so, as they do not exhibit any features different from those already described.

It will be seen that, in all the preceding cases, the modifications of the heart's action was either the diminution or obliteration of the first sound, or the equable diminution of both, so as to produce the foetal character: but there is another modification, which, though of rare occurrence, is most interesting: in this we find the *first sound preponderates*. Of this variety but two cases have been observed: the first occurred in my own practice, and the second was of a patient treated by Dr. Graves, for the history of which I am indebted to one of our most accurate observers, Mr. William M. Murphy.

CASE XIII.—*Petechial Fever, with Bronchitis and Diarrhœa; vigorous Action of the Heart up to the ninth Day; Preponderance of the first Sound on the sixteenth Day; Use of Wine; Recovery.*

Thomas Keefe, æt. 30, a strong muscular man, was admitted on the 11th May, being then nine days ill; he was abundantly maculated; well marked bronchitic rales in both lungs; the action of the heart was vigorous, and both the sounds natural; pulse 108, full. The chest was cupped and blistered, and pills of blue pill and ipecacuanha exhibited.

DATE.	GENERAL SYMPTOMS.	PHENOMENA OF CIRCULATION.	TREATMENT.
May 13.	Severe diarrhœa.	Pulse strong; both sounds are distinct and proportionate, but they seem as if distant.	Omit the pills; poultices to the abdomen.
„ 14.	The diarrhœa continues; maculæ abundant and florid.	Sounds of the heart more feeble; the impulse is imperceptible except at the termination of expiration; pulse 100, strong.	Saline mixture; arrow root.
„ 15.	The bronchitis is more severe.	Impulse quite imperceptible; both sounds feeble but distinct; pulse 100, feeble.	Wine 6 oz.; dry cupping; blister to the chest; pills of ipecacuan, hyosciamus, and carb. ammonia.
„ 16.	Pupils contracted; bronchitis continues; tongue glazed and red.	Impulse imperceptible; sounds as before; pulse 92, a shade stronger than yesterday.	Wine 12 oz.; beef tea; antimonial mixture, with 3 grains of tart. emet.
„ 17.	Some diarrhœa; no vomiting; bronchitis diminished; the petechiæ are not more livid; pupils less contracted; tongue improving, becoming moist and pale at the edges; the wine was given warm.	Impulse again perceptible; pulse 82; both sounds of the heart can be heard.	Wine 10 oz.; senega mixture; musk and camphor pills.
„ 18.	Tongue improving; petechiæ fading.	Sounds of the heart not so distinct as yesterday; <i>the second can scarcely be heard</i> ; impulse perceptible.	Repeat all.
„ 19.	Slept well: diarrhœa continues.	Sounds as yesterday; impulse imperceptible.	Wine 10 oz.; blister to the heart; bark mixture.
„ 21.	General improvement; slept well; perspiration.	<i>Both sounds can now be heard; they are feeble but proportionate</i> ; impulse imperceptible; pulse 72.	Wine 8 oz. repeat the mixture.

DATE.	GENERAL SYMPTOMS.	PHENOMENA OF CIRCULATION.	TREATMENT.
May 22.	Improvement continues.	The sounds over the right cavities are proportionate ; over the left the first is much more feeble than the second ; no impulse.	Repeat all.
„ 23.	Skin cool ; appetite good ; no bronchial rales.  Convalescent.	First sound much more distinct ; impulse plainly perceptible ; pulse 72.	Wine 4 oz.

CASE XIV.—*Petechial Typhus with Palpitation of the Heart and Bronchitis ; Preponderance of the first Sound of the Heart ; Recovery.*

William Hawkins, æt. 34, tall, not very robust ; admitted into hospital October 18th, 1838 ; eleven days ill. Illness commenced after exposure to a draught of air, by rigors, succeeded by heat, &c., also by violent palpitations of the heart, which he says lasted for seven days. On admission the pulse was intermitting, there was a strong action of the heart, but it was also intermitting.

19th, (twelfth day). Abundantly maculated, severe headache, impulse of the heart feeble, no intermission of sounds. *First preponderates considerably, most marked at the sternum ;* abdomen tympanitic ; he is constipated ; a blister was applied to the abdomen ; camphor mixture, chalk mixture, and rhubarb wine ordered, and a turpentine enema ; the pulse was regular 100.

20th, (thirteenth day). The pulse was 104, stronger but intermitting ; no impulse ; the sounds more feeble, and intermitting synchronously with the pulse, *first preponderating considerably ;* bronchitis in both lungs ; was cupped, blistered, and ordered 5 grs. of hydrarg. c. cret. every fourth hour. Was visited in the evening, and the pulse and heart were regular. The bronchitis became very severe, for which he was re-

peatedly blistered, and the mercury pushed to slight salivation ; the pulse and heart continued without intermission, *but the first sound preponderated all through.*

On the 24th, (seventeenth day of illness), he got 6 oz. of wine. On the 28th, (twenty-first day), the pulse was 64 ; no impulse of heart, the sounds became proportionate. On November 4, (twenty-ninth day), the impulse was felt, sounds proportionate, pulse 64.

November 12th. Left the hospital quite well.

We have thus two cases in which the first sound preponderated. In the first this peculiarity was not observed until the sixteenth day ; while in the second it was recognized on admission, (the ninth day,) and the sounds did not become natural until after the twenty-first. In this case it will be observed, that the pulse was intermitting, and that the patient complained of palpitation from an early period of the fever.

Let us now examine the results of dissection in a few cases in which feebleness of the heart's action was recognized.

CASE XV.—*Severe maculated Typhus complicated with intense Bronchitis ; Gastritis ; Perspiration on the 13th ; Employment of Wine ; Death.*

John Harris, of full plethoric habit, had always enjoyed good health, and although in the habit of taking whiskey, never drank to excess ; has had fever for six days ; his chest and arms are covered with well-defined bright red petechiæ, complains of much pain in the head and dimness of sight ; tongue furred, epigastrium very tender on pressure, bowels constipated ; passes small quantity of urine ; pulse 96, and full ; respirations 28 ; some wheezing and sibilant ronchi are heard in anterior portion of lungs, face very much flushed. He was ordered efferv. draughts.

DATE.	GENERAL SYMPTOMS.	PHENOMENA OF CIRCULATION.	TREATMENT.
June 8.	Presents the same appearance as yesterday; slept badly; bowels relieved.	Pulse 96.	Wine 6 oz.
9.	Has had another bad night; is very restless; countenance flushed.	Sounds of the heart very feeble; pulse small and compressible, 96.	Continue wine.
10.	Better night than he has yet had.	Pulse much stronger and fuller, 104, and by no means so compressible; sounds of heart a shade stronger than yesterday.	Continue wine.
12.	Did not sleep so well as on the previous night; extreme debility.	Pulse 116; sounds of the heart precisely resemble those of the fœtus in utero.	To have a glass of hot punch immediately; wine 12 oz.; blister between the shoulders and terebinthinate enema.

From this period the patient got worse. The bronchial disease became intense and general, so much so that it was hardly possible to make any accurate observation of the sounds of the heart; the impulse, however, was imperceptible; the pulse became intermitting, and increased in frequency to 120, and on the next day to 136. He died on the following day, the seventeenth of his disease. On the sixteenth day his extremities were cold. In this case active stimulation was employed. The patient got nearly eighty ounces of wine; he was dry-cupped and blistered, and used emetics, from which he experienced great relief three days before his death.

*Post Mortem, eleven Hours after Death.*—The heart is of its natural size, livid, and feels extremely soft, pitting on pressure, particularly over the left ventricle; some white patches may be seen on the right ventricle; the lining membrane of the left auricle presents nothing remarkable; the left ventricle was

divided from its base to apex ; the muscular substance presents a very singular appearance, not a trace of fibre being visible ; and for more than two-thirds of its length, a layer presenting a darker colour and of more homogeneous appearance, of one-eighth of an inch in thickness, was found ; into this layer it is very difficult to trace the muscular fibre. The substance of the ventricle is infiltrated with a gummy matter, causing the fingers to stick together ; the structure has some resemblance to the cortical structure of the kidneys ; a transverse section gave the same appearance. The net-work of fleshy fibres exhibits more firmness, though analogous in condition ; the posterior columns seem but little altered, being only pale, their firmness remaining perfect ; the same may be said with respect to the anterior ; the right ventricle is harder and firmer, and does not exhibit the same aspect as the left ; the auricle of the same side contains a coagulum ; nothing remarkable in the colour and appearance of the membrane ; the septum cordis presents the same appearance as the left side. On examining the abdomen, nothing abnormal presented itself. The ileum is perfectly healthy ; no enlargement of the glands.

*CASE XVI.—Maculated Typhus with severe Nervous Symptoms ; Predominance of the second Sound on the sixth Day ; complete Absence of the first Sound on the tenth Day ; Death ; softened State of Heart ; Ulceration of the Ileum.*

Richard Cashel, æt. 46, admitted 5th November ; six days ill ; he complains of pain in back, neck, and extremities ; considerable prostration ; maculae abundant, of light colour on chest and abdomen, but much darker on back ; slept very little last night ; raved a good deal, but was not violent ; has no headach ; pupils slightly contracted ; very little cough unaccompanied by expectoration ; stools thin and watery ; abdomen soft and tender on pressure ; great thirst ; tongue brown and dry in centre ; teeth covered with sordes ; pulse 116, rather feeble ; respirations 28 ; auscultation detects slight bronchitis

in both lungs; while the patient lies on his back the impulse of the heart cannot be felt, but becomes perceptible when he turns on his left side; both sounds are audible, and the second predominates slightly over the first; ordered an anodyne enema.

DATE.	GENERAL SYMPTOMS.	PHENOMENA OF CIRCULATION.	TREATMENT.
Nov. 7.	Raved much; skin hot and dry; maculæ dark; respirations 28.	Pulse 116, as yesterday; the impulse of the heart cannot be felt to-day; sounds more feeble than yesterday, scarcely audible above the mamma, and to the left; more so at the sternum; the second preponderates.	Repeat wine, 8 oz.
,, 8.	No raving; extreme prostration; considerable œdema of body; maculæ very dark coloured; sordes on teeth and tongue excessive; is unable to raise himself without assistance.	Pulse exceedingly feeble and irregular, being from about 116 to 124; no impulse of heart; sounds very feeble, almost inaudible to the right of nipple; the second is still loudest.	Wine 16 oz.; beef tea.
,, 9.	Was very restless all night; picking at the bed-clothes, and muttering constantly; passes his water under him; lies on his side; maculæ very abundant, and quite livid on the back.	Pulse 120, exceedingly feeble, obliterated on the slightest pressure; when lying on his left side the impulse could then be felt, but on turning on his back it was felt to be vigorous; <i>the double sound of the heart was completely lost, the distinct clear "rap" of the second alone being heard; most distinct also at the base of heart.</i>	Wine 20 oz.; brandy 2 oz.
,, 10.	Lies on his back; mouth wide open; constant spasm of the muscles of lower jaw; constant moaning; <i>is in profuse perspiration</i> ; excessive œdema of body; respiration 40; stools involuntary.  Died at one o'clock, P. M.	Pulse 150, exceedingly weak and irregular; impulse of heart evident and pretty strong; in consequence of his moaning, no accurate accounts of the sounds could be taken.	

*Dissection, twenty Hours after Death.*—The body was more than usually livid ; the petechiæ were pale on the fore-part of the body, but very dark and livid on the back ; abdomen tympanitic ; the pericardium contained about half a pint of straw-coloured serum ; the heart was of large size, and so extremely flabby, that it was capable of retaining any shape in which we placed it ; the *right cavities* were softer than natural, admitting the fingers through their walls without much resistance ; in the muscular structure of the left cavities, however, this change was much more remarkable ; the weight of the finger was almost sufficient to penetrate its walls, they were so exceedingly softened ; it is very easily torn, and the edges thus separated have no longer the moistened appearance, but seem as if quite dry. The septum cordis was equally softened ; there was some dark fluid blood in the right cavities. The stomach presented some red patches, slightly elevated ; towards the pylorus, the mucous membrane was thickened and softened, and was easily removed by the handle of the scalpel. The duodenum was tolerably healthy, having only in two or three places slight blushes of inflammation. The ileum was more extensively involved ; this was particularly observable in the last two feet of its length, near to the ileo-cæcal valve : there were five ulcerated points ; the superficies of the ulcers were covered by a delicate membrane, beneath which there was a yellow-coloured fluid, resembling pus ; the largest was about the size of a silver penny : round these infiltrated points the intestine was much inflamed, and several minutely injected capillaries were seen ramifying around these points, but they could not, even by the aid of a good lens, be traced into the ulcers ; when the membrane was removed under water, and the puriform matter washed off, a decided depression was left, at the bottom of which was easily seen the muscular coat of the intestine : dispersed further throughout the intestine were several of the elliptical patches. The glandulæ aggregatæ were very prominent in many places.



The general type of fever in this case did not at first seem worse than in many others in which recovery took place. But the patient had been greatly exhausted before admission by hypercatharsis, induced by two enormous doses of castor oil which he took on the second and fourth days of his disease. This circumstance is not unfrequently met with in our wards; and I do not know a worse preparation for the struggle in the advanced stage of typhus than over purging in the commencement. The medicine commonly employed is glauber salts, in a very large dose; this is taken independent of any medical advice, and in several cases the ulceration of the intestines seems to have been promoted by its action.

The pulse in Cashel's case rose from 116 to 150, *under the use of wine*. This and the extreme foetor of the body led to the worst prognosis.

In the phenomena of circulation, the most interesting point is, that while the first sound was absent, *the impulse continued*. *On the day of his death the impulse was very evident, and yet we found a softened left ventricle*. We shall see that the diminution or cessation of the first sound, and of the impulse, are not always coexistent. It is hardly necessary to observe on the difference between these phenomena and those in the case in which wine was successfully employed. On two occasions we were forced to omit the wine, and ultimately we abandoned its use.

In this case, also, the peculiar diminution of the first sound was not observed until the day before death; and on the previous day, (two days before death,) the impulse and sounds were strong. I conceive that the morbid change in the left ventricle did not occur in this patient so early, or to the same extent, as in other cases.

In observing on the cases of Cavanagh and Smyth, (see page 26,) I have stated that we had not yet recorded any instance in which the alteration of the first sound was accompanied with or preceded by signs of irritation. In this case, however, and in that communicated by Mr. Murphy, *where the first sound pre-*

dominated, the symptom of irregularity of the heart existed; and in Mr. Murphy's case there was pain. How far these circumstances indicated inflammation we cannot now determine; but it must be remarked, that the effect of wine was totally different in the two cases.

CASE XVII.—*Severe maculated Typhus, with cerebral Irritation, and great Prostration; Diminution of the first Sound of the Heart on the Day before Death; Use of Wine; Death on the nineteenth Day.*

Catherine Murphy, æt. 30, of good constitution; six days ill on the 10th of June. She complains of pain of the forehead and temples, for which she was leeched, without relief. The petechiæ are abundant, and very livid; no thoracic complaint; has much abdominal tenderness, and diarrhœa. Was ordered six leeches behind the ears.

DATE.	GENERAL SYMPTOMS.	PHENOMENA OF CIRCULATION.	TREATMENT.
June 11.	Tongue furred, and dry; purging still continues; respirations 44.	Pulse 120, feeble; impulse of the heart perceptible; both sounds of the heart proportionate,	Wine 4 oz. arrow root.
" 12.	Had a restless night; passes her urine involuntarily, and is much weaker than yesterday; pain of forehead and temples continues; respirations 32.	Pulse 120; sounds of the heart louder than yesterday.	Wine 12 oz.
" 13.	Raved a good deal last night; <i>after having taken eight ounces of wine, pulse rose to 130, and was very small</i> ; has no purging; tongue coated, and dry.	Pulse 130, very feeble; sounds of the heart proportionate, but feebler than yesterday; impulse scarcely perceptible.	Blister applied over the sternum; continue wine as yesterday.
" 14.	The blister was applied yesterday, but in consequence of her changing the position so very frequently, it did not rise; the acetate of cantharides was then used, and proved efficacious; very low; respirations 32.	Pulse so irregular, that it cannot be counted; impulse not perceptible; sounds of heart as yesterday.	Wine 24 oz.

DATE.	GENERAL SYMPTOMS.	PHENOMENA OF CIRCULATION.	TREATMENT.
June 15.	Raved all night ; does not pass her water under her, but gets up whenever it is necessary.	Pulse 124, and full ; impulse and sounds of the heart as yesterday.	Continue treatment.
„ 16.	Did not rave last night ; the wine produced so much excitement yesterday afternoon, that it was found necessary to stop its further exhibition.	Pulse 112.	Wine 12 oz.
„ 17.	Was again obliged to stop the wine, after taking eight ounces ; bowels regular ; tongue cleaning.	Pulse 100 ; impulse of the heart again perceptible, and the sounds proportionate and stronger.	Omit wine ; beef tea.
„ 18.	Raving and moaning throughout the night ; respirations easy and natural.	Pulse 104 ; impulse and sounds of the heart as yesterday.	Anodyne draught.
„ 19.	Raving all night ; on pressing the larynx, she complains of pain, but will not allow an examination.	Pulse 120, and full.	Anodyne enema ; flannel waistcoat.
„ 20.	Did not rave last night ; sacrum very sore ; pupils contracted ; allowed her throat to be examined this morning, when several diphtheritic patches were seen.	Pulse 130, and very feeble.	The strong muriatic acid to be applied to the throat ; blister to neck.
„ 22.	Extreme prostration, but is perfectly sensible ; voice much clearer than yesterday ; respirations 40.	Pulse 120 ; heart's action morbidly excited ; sounds proportionate.	Decoct. cinchon. 6 oz. ; tinct. cinchon. 3 oz. ; sumat $\frac{3}{4}$ l. secundis horis ; porter one pt. and beef tea.
„ 23.	Is still sensible ; countenance expressive of great anxiety ; is very low ; moaning, and tossing her arms about considerably ; respirations hurried, 64 ; teeth thickly covered with brown sordes.	The first sound of the heart is scarcely audible, while the second is distinct and clear ; pulse extremely feeble, and so irregular, that it cannot be counted.	As yesterday.
„ 24.	Died at half-past one.		

*Dissection twenty Hours after Death.*—The body presented an unusually livid appearance. On the abdomen were observed numberless minute vesicles, and on the sacrum there was a large sloughing sore. The muscular structure was firm and healthy. On opening the chest the lungs presented a healthy appearance; posteriorly they were rather congested, but this seemed to be the result of gravitation of blood. The pleuræ were not adherent. On slitting up the pericardium it was found to contain about half a pint of straw-coloured fluid; the covering itself seemed healthy. The heart was of small size; the muscular structure of the left ventricle was softened, but not to the same extent as in the preceding cases; on cutting into it, the fibres were perceptible, but they presented nevertheless a rather homogeneous appearance, and a peculiar glairy semi-gelatinous fluid was found between them; there was no valvular disease. The intestines were bound down by old adhesions, and were free from ulceration; the smaller were much congested and softened.

The circumstances worthy of remark in this case are, that wine did not agree with the patient, and that the phenomena of the heart were very different from those detailed in most of the preceding cases. Under the use of wine, the pulse rose from 120 to 130, and then became exceedingly irregular; it next fell to 124, and was full; it continued to diminish in frequency; again increased, and became irregular. Its rate was as follows:

Seventh day, 120.

Eighth day, 120.

Ninth day, 130.

Tenth day, irregularity so great that it could not be counted.

Eleventh day, 124.

Twelfth day, 112.

Thirteenth day, 100.

Fourteenth day, 104.

Fifteenth day, 120.

Sixteenth day, 130.

Seventeenth day, 120.

Eighteenth day, irregularity as before.

CASE XVIII.—*Petechial Typhus, with severe nervous and catarrhal Symptoms ; great Feebleness of the Heart on the twelfth Day ; Use of Wine ; vigorous Action of the Heart for four Days before Death.*

Eliza Bourke, *at. 35*, admitted on the 7th March, the eleventh day of fever. On admission she was delirious ; in a state of great collapse, with cold extremities, and miserable pulse. She was given 4 oz. of wine, and artificial heat applied to the feet ; during the night she never ceased howling and screaming ; lies on the back in an extreme state of prostration, raving immoderately, moaning, and sometimes screaming aloud. Countenance flushed, wild, and ferocious ; eyes suffused ; pupils natural ; sordes on teeth and lips ; she points to the head as the seat of much distress ; thirst urgent ; skin hot, dry, and covered with livid coloured petechiæ, evidently on the decline ; tongue fissured and brown ; pulse 136, small and weak ; respirations 40, laboured and interrupted ; intense general bronchitis ; impulse of the heart imperceptible ; no accurate observations could be made as to the sounds, from the loudness of the rales.

DATE.	GENERAL SYMPTOMS.	PHENOMENA OF CIRCULATION.	TREATMENT.
March 9.	Thirteenth day of fever ; slept well ; delirium much less ; pupils somewhat contracted ; upper and lower extremities quite cold ; tongue covered with black crust ; respirations 28.	Pulse 140, small and weak but a degree stronger than yesterday ; impulse of heart slightly perceptible ; both sounds can now be heard below the mamma, and are much stronger than yesterday.	Wine 24 oz. ; turpentine enemata.
„ 10.	She is more tranquil, but the countenance retains the wild expression ; extremities warm ; respirations 32, laboured.	Pulse 128, much fuller and stronger ; the impulse is much improved, and the heart can be felt pulsating over several square inches ;	Repeat wine ; blister to the head.

DATE.	GENERAL SYMPTOMS.	PHENOMENA OF CIRCULATION.	TREATMENT.
March 11.	After each dose of wine, which has been given mulled, her general appearance became much improved, but the bronchitis is very intense; and in both lungs, inferiorly, a moist crepitating rale can be heard.	the sounds are louder, and the first sound has increased in strength.  No change in impulse and sounds of heart; pulse 132.	Repeat wine.
,, 12.	Breathing more difficult and laboured; great wheezing in the throat; respirations 44; and rales in all parts of the chest more sonorous and intense.	The impulse of heart still more perceptible, but its sounds much obscured by the rales.	Repeat wine; pills of Ipecac. carb. ammon., & hyoscyam.
,, 13.	She is sinking rapidly; respirations 64 in a minute; congestion of the lung much increased.	Pulse 124; no change of the impulse or sounds of the heart.	Wine 24 oz.
,, 14.	Died.		

There were many circumstances which led us to form a bad prognosis in this case; I would particularly specify the advanced period of fever at which she was admitted, the violence of the bronchitis, and great rapidity of pulse. Among the secondary diseases of typhus, there are few more dangerous than the bronchial affection, or one that demands the same decision in treatment *in the earlier periods of the case*; and there can be little doubt that had the chest been relieved by proper means, within the first week of this woman's illness, the chance of recovery would have been much greater.

It will be recollected that the pulse, on the thirteenth day of fever, was 140; and that after 24 oz. of wine had been given, it fell to 128: so far there was evidence that the wine was acting well; and on the fourteenth and fifteenth days there was an im-

provement in her condition generally. The respirations, however, became more and more difficult, and she sunk with all the symptoms of suffocation.

In the cases detailed in the beginning of this paper, it will be seen that the returning impulse and sounds were accompanied by other and decided marks of improvement; but here we had the action of the heart suddenly becoming less frequent and much more vigorous, with preservation of both sounds, while the catarrhal symptoms were increasing. The heart was not merely restored to its natural standard, so far as impulse and sounds were concerned, *but it was obviously excited*; and this excitement continued for four days before death.

The action of wine upon the heart in typhus may be said to be both sedative and stimulant; sedative in diminishing its frequency, stimulant in restoring its impulse and muscular sounds; but in its favourable action, the vigour of the impulse, and the intensity of the sounds do not pass the limits of health.

There is a point where its stimulating effect should cease, and if this is passed, wine is either useless or injurious.

I have now given such cases as I conceive are sufficient to introduce the subject of the state of the heart in typhous fever to the consideration of the profession. I might add other cases, but they do not elucidate any new point, and I have given the results of the fatal cases.

If we examine authors on the subject of the state of the heart in typhus, we find, that, with the exception of Laennec and Louis, there is but little information given. Laennec does not seem to have examined the point to any extent: and Louis contents himself with recording the state of the heart in a certain number of subjects who died of fever; but in neither author do we find observations on the physical phenomena of the heart during life.

In his chapter on Softening of the Heart, Laennec writes as follows:

“The variety of softening which accompanies idiopathic

fevers does not in general present any change of colour in the heart, or it is attended with a deeper colour than natural, approaching purple; sometimes, however, it is yellowish. I think it may be compared to that adhesive softness of the other muscles, often observed in these cases, and which is also accompanied by a degree of redness greater than natural. This softening of the heart, as well as the analogous gluey or fishy state of the muscles, is particularly observable in putrid fevers, more especially when these exhibit the phenomena formerly considered as marks of putridity, viz. livid intumescence of the face; softening of the lips, gums, and internal membrane of the mouth; black coating on the tongue and gums; earthy aspect of the skin; distended abdomen; and very foetid dejections. I cannot assert that this softening of the heart exists in all kinds of continued fevers, but I have met with it constantly in such cases as I have attended to; and I have always thought it more marked in proportion as the signs of an alteration in the fluids were more evident. Could it account for that frequency of pulse which exists sometimes for several weeks in convalescence from fevers, although the patient continues to regain flesh and vigour?"

I shall next quote from Louis—Dr. Bowditch's translation:

"The heart had the size, consistence and colour natural to it in half of the cases, or in twenty-three subjects; rather less frequently, *ceteris paribus*, among those who died between the eighth and twentieth days of disease, than among those who died after this epoch.

"It had less consistence than natural in twenty-four other subjects. This diminution of consistence was slight in seven cases, and as when in this degree one might consider it less as a morbid state than as a variety of the natural consistence, or as it is called, of its physiological state, I shall not consider these cases in what follows, and thus the number of patients we must examine is reduced to seventeen.

"The softening of the heart was, moreover, very slight in



two of these cases. But as it was limited to the left side of the organ, we cannot consider it as the result of natural disposition; but there is a still more important reason for this opinion, viz. it happens sometimes, when the softening is considerable, that it is more so at the left than at the right. In the other cases it was universal and very marked, the heart was very flaccid, so that in many cases it had no precise form, but like a wet cloth retained any shape into which it might happen to be placed. Its substance in these cases had very little power of cohesion, was easily torn, and was very easily penetrated by the finger.

“At the same time that it was softened, the heart had less colour than usual in many cases; it was of an onion-peel colour, which varied in intensity, and was generally livid and purplish on its surface as in its substance. The internal face of the ventricles and auricles was, on the contrary, of a deep violet-red colour, which colour sometimes penetrated beyond the lining membrane, and appeared owing to an imbibition of blood, which it resembled more or less in colour.

“When thus softened and pale, the heart had no longer, when cut, the slightly moistened aspect it has generally, but it was, as it were, dry and unpolished, such as we have seen the liver appear in analogous circumstances. Its size was not larger than usual, and it appeared smaller in two cases (Obs. 14, 33), and, therefore, it appears to me, we ought not to consider this as an effect of the softening of the organ, but rather as a natural *disposition* which existed in other patients likewise, in whom the heart presented nothing else remarkable, (Obs. 31, 39, 41).

“Another fact, which it is important to notice is this, viz., that in nearly all the cases of softening, the walls of the ventricles were evidently much less thick than usual, those of the left especially, which were often three lines thick only. And as this diminution of thickness was limited to cases of softening, we must consider it as a morbid affection.

“If these facts are insufficient to enable us to discover the cause of the softening of the heart, at least they exclude the

idea of one of those affections which usually cause a great number of affections, viz., inflammation. For how can we allow that inflammation is the cause of an acute softening accompanied by a diminution of thickness, paleness of colour, and a kind of dryness of the texture which is the seat of it? Such a supposition would truly imply a contradiction, and, as I remarked in relation to the softening of the liver, if we knew any cause of disease exactly the reverse of inflammation it would be proper to refer this softening to it.

“ Other considerations which I have already given in relation to the spleen support these reflections. The walls of the heart, although more or less softened, had never any pus in them, and there was never any inflammation of the pericardium, which would have been the case rather frequently in softening of the heart, had this softening been caused by inflammation. And in opposition to this opinion, we cannot produce cases of pericarditis observed after other acute diseases, inasmuch as softening of the heart was found in two cases out of eight in which there was pericarditis.

“ Moreover, the frequency and severity of the softening were much more marked according as the disease was more early fatal. Thus the heart was softened in nearly half of those patients who died between the eighth and twentieth days of disease, in a third of those who died during the following period, and in a somewhat smaller proportion among those who died afterwards. Besides, in seven cases in which the softening was extreme, not one was relative to individuals who died after the thirtieth day of the disease, and I found

4 out of 17 patients of the first and second series,

3 „ 20 „ third „

“ Hence we see, that whatever was the degree of softening, the proportion of cases in which it took place in the different series of patients was very nearly the same ; and it was like that of the liver and spleen, more serious in those who died early in the disease, than in those who died after the twentieth day, and

we did not find it at its *maximum* in patients belonging to the fourth series. The rapidity of its development showed the extreme violence of the cause to which it was owing in certain cases, and as other lesions of the same kind, it necessarily contributed much to produce death and hasten its arrival.

“ Another fact which seems to me to be not less remarkable than the rapid softening of the heart is this, viz., no similar lesion was found in any other muscular organ; as all the muscles which preside over voluntary motions preserved, amidst the general disorder, the consistence and colour which are natural to them.”\*

In these extracts I have given all that has been discovered on the subject; no series of observations on the action of the heart in typhous fever has been published; I have commenced this inquiry, and have sought to derive some important indications of treatment from the existence of the phenomena now described. In the present state of the inquiry I wish it to be understood, that my observations are to be taken as referring principally to the epidemic of last year. Further researches must be made to establish how far they may be applicable to typhus in general; but I have little doubt from studying the researches of Louis, and connecting the facts relative to the anatomical state of the heart, with those now observed as to its vital phenomena, that my observations will be found to have a very extensive application.

The epidemic of last year was marked by all the signs of putridity. Dark coloured and abundant petechiæ; sordes of the mouth, fœtor of the surface, extreme prostration, and stupor, were the prominent features of the disease; and in many cases bronchial and gastro-enteric irritation existed to a great degree.

In many of the cases the bad symptoms were developed at an unusually early period, yet though recovery by crisis was by no means common, the convalescence was generally satis-

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\* Louis. Bowditch's translation.

factory, and the ultimate restoration to health complete. In several instances the disease was traceable to contagion.

We may thus arrange the cardiac phenomena obtained in our typhous fever :—

1. Impulse and sounds remaining unaltered ; the action of the heart corresponding with that of the pulse.
2. Vigorous impulse, with distinct and proportionate sounds, with absence of pulse for many days.
3. Diminution of both sounds of the heart, with absence of great diminution of the impulse, (foetal character).
4. Diminution of the first sound ; with cessation or great feebleness of the impulse.
5. Complete extinction of the first sound, the second remaining clear.
6. Predominance of the first sound, the second being extremely feeble.

Of these the fourth and fifth were the most common.

I have before remarked, that in the progress of a single case we may observe first one and then another of these groups of signs. Thus in the second case, (see page 11,) the sounds on the seventh day were proportionate, but so much diminished as to resemble those of the foetal heart. On the eighth day this character was lost, and both sounds were much louder, with returning impulse ; while on the eleventh the second greatly preponderated. Nearly the same phenomena were observed in the third case, (see page 15,) and in the sixth, (page 24.) In the case of T. Keefe the second sound was most distinct in the early periods of the case, while the first became predominant towards its close.

In the great majority of cases, however, the phenomena were as follows :—

- I. Diminished impulse.
- II. Diminished first sound, particularly of the left cavities.

With respect to the impulse we arrived at some unexpected results. In most cases, considered through the whole progress,

the diminution and return of the first sound were accompanied with the diminution and return of the impulse. So far the phenomena were what we might expect. *But in some instances, at particular periods of the case, this accordance between the impulse and sound did not exist.* In the second case, (page 9,) the sounds became distinct before the impulse returned. In the third case, (see page 12,) the impulse became distinct on the eleventh day, while the second sound greatly predominated. In the third, (page 15,) we found that on the eighth day the sounds were not in proportion to the impulse; and on the tenth, the impulse continued, but the first sound was totally absent. On the next day no impulse could be felt, yet the first sound was feebly audible. In the fourth case, (page 19,) the impulse on the twelfth day was less perceptible than on the day previous, but the first sound had more strength.

It is difficult, or impossible, in the present stage of the inquiry, to offer any satisfactory explanation of these apparent anomalies; but it seems certain, that under the influence of the typhoid condition, the heart may have sufficient force to give an impulse with little or no sound, on the one hand; and on the other, its contractions may be accompanied by a sound, although the impulse be absent. Whether we are to explain these facts by referring to particular states of innervation of the heart, or to organic alteration in the muscular fibres, or their connecting cellular membrane, is still to be determined.

My friend Mr. Hopper has suggested, that, if there be any anormal liquid secretion between the muscular fibres, the production of sound might be materially interfered with, though the muscle might contract with a certain degree of vigour. In two of our fatal cases, we found that there did exist a liquid tenacious secretion in the fibres of the left ventricle; and it becomes a question, whether the softening of the heart in typhus is dependent on an alteration of the muscle itself, or an infiltration between its fibres. Analogy would lead us to conclude, that in the early stages of the alteration at least, the fibre itself

is but little affected; and the fact of the rapid restoration of the functions of the organ, in the convalescence of fevers, and the occasional excitement of the heart before death, seem to point out, that *in such cases* the injury of the muscular fibre itself has not proceeded very far.

That the cause of the want of impulse, and feebleness or cessation of the first sound, is a softening of the heart, I have no doubt. The evidences in favour of this opinion may be thus stated:—

I. That softening of the heart exists in typhous fever as a local disease, and without any analogous condition of the muscles of voluntary life.

II. That in our dissections in the last epidemic, we met with this softening of the heart, in cases which during life had presented the phenomena in question.

III. That the physical signs indicate a debility of the left ventricle principally, and it is this position of the organ which is most often altered in consistence.

IV. Laennec has stated, that in proportion to the severity of the putrescent phenomena, is the liability to softening of the heart. And the same observation is found to be true of the physical signs now described.

If this softening of the heart be one of the secondary diseases of typhus, we should, as in the case of other lesions, observe something like periodicity in its phenomena. It should appear at a certain time, and decline after its proper period had expired. I have analysed my cases with a view to these points, and the result is, that in most instances the signs of diminished impulse and first sound were developed at or about the sixth day, and the heart seemed again healthy at or about the fourteenth day. It is difficult to determine the period of the first development of the signs in many cases, as they existed on the admission of the patient, but still taking in these cases the dates of the disappearance of the signs, we get the following general results:—

Average date of appearance, sixth day.

„ date of cessation, fourteenth day.

One case has been excluded from this analysis ; the patient was admitted on the tenth day, and the heart was not reported healthy till the twentieth.

We thus get, as the duration of the phenomena, a period of about eight days. It is very probable, however, that the disease begins to be developed before the sixth, and that it subsides before the fourteenth day ; for, as physical signs are our only means of detecting it, it is not likely that they would be well marked in its very first development, or indicate exactly the time of its subsidence.

In the softened condition of the ventricle, particularly the left, we have the explanation of the diminished impulse and first sound, and a new evidence of the truth of the theory which attributes the first sound to the ventricular contraction ; and the theory which explains the second sound by the reaction of the arterial column of blood on the semilunar valves, receives also from these facts an additional though indirect verification. With respect to the second sound, we must consider it in two sets of cases : first, where both sounds were equally diminished, and secondly, where the first greatly predominated. The phenomena of the first class might seem explicable, by referring to the diminished vigour of the ventricular systole and diastole, which would affect the physical relations of the arterial column, as noticed in the Report of the London Committee of the British Association, communicated at the meeting of 1837 ; but when we find, in many cases, that the first sound became greatly diminished, or even extinct, while the second remained clear, we encounter a difficulty. In the second class of cases, of which I have recorded but two examples, we have no means of explanation, unless by assuming that there existed a diminished resiliency of the arterial trunks.

I am decidedly of opinion, that we cannot consider the softening of the heart in typhus as the result of carditis ; it

seems rather to be one of that class of affections not yet sufficiently examined, in which an infiltration of some peculiar substance takes place under the influence of the typhoid condition.\* This occurring in the heart seems to impair its functions to a great degree ; but the rapid restoration of the heart to health points out that the disease has not materially impaired its organic condition. It is obvious that we can never meet with the affection in a very advanced condition, for death by syncope would occur after the contractility of the heart had been altered up to a certain point.

Finally, I would draw the particular attention of my readers to the fact, that in the great majority of these cases the use of wine was followed by the happiest effects. I may safely refer to the cases in proof of this proposition ; *and I believe that in the diminished impulse, and in the feebleness or extinction of the first sound, we have a new, direct, and important indication for the use of wine in typhous fever.* In some cases the existence of these phenomena at an early period of the disease, led us to anticipate the bad symptoms, and to commence in good time the use of the great remedy ; and in others, notwithstanding the existence of severe visceral irritations, the use of stimulants has been adopted with the best success, from the same indication.

It will be seen that the quantity of wine employed in the foregoing cases was considerable. I shall exhibit in the following table the quantity given, the day on which its exhibition was commenced, and the period of the fever, as nearly as we could calculate it.

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\* On this point it will be seen that I adopt, with respect to the heart, the views which Dr. Staberoh, of Berlin, has put forward with reference to the follicular disease of the intestines in typhus. See his paper, Dublin Medical Journal, vol. xiii.



NAME.	QUANTITY OF WINE.	DAY OF COMMENCEMENT OF WINE.	DURATION OF FEVER.
Cavanagh, . .	26 ounces.	8th day.	13 days.
Wright, . . .	36 "	14th "	22 "
Devereux, . .	42 "	14th "	16 "
M'Kone, . . .	60 "	12th "	16 days; wine continued to the 20th day.
Wallace, . . .	66 "	11th "	18 days.
Kain, . . . .	88 "	9th "	16 "
Smyth, . . . .	144 "	10th "	18 "
Edwards, . . .	156 "	10th "	20 "
Quin, . . . .	158 "	5th "	14 "
Hickey, . . . .	170 "	7th "	17 "

These cases may serve as illustrating the line of treatment which we adopted in our last typhus. In no epidemic did I ever before give so much wine. I never had such success in treatment. The list might be greatly enlarged, but no advantage could be gained by so doing. One case, however, may be mentioned, in which the whole quantity of stimulants employed was greater than in any of those now detailed. The patient was an elderly woman, who was admitted after having been three weeks ill, in a state of extraordinary prostration. There were no decided petechiæ, and the fever was of a more purely nervous character than is common. The disease ran on to nearly six weeks. The following is the account of the stimulants employed :

Wine, 292 oz.

Brandy, 20 oz.

Porter, 7 bottles.

Ethereal enemata, 2.

Jelly, beef tea, &c. &c.

Her recovery was perfect.

The form of fever under which this woman laboured has been but rarely observed in our wards : it is characterized by extreme adynamia *unaccompanied by the phenomena of putrescence*; its duration is much longer than that of the ordinary disease, its termination less critical, and it seems uncompli-

cated with any distinct visceral affection. If any disease deserves the name of a "pure nervous fever," this one does. The disease to which it is most closely allied is the febris lenta nervosa of Frank, but it differs in the absence of signs of abdominal irritations.

In this patient the disease ran on to nearly six weeks; the principal symptoms being extraordinary prostration, coldness of the surface, feebleness and irregularity of the heart's action: and it was not until the end of the eighth day of the exhibition of wine, and other stimulants in great quantities, that any favourable influence was produced on the circulation; and the case strongly illustrates the advantage of persisting in the supporting system, although no amendment seems at first to follow its employment.

If, on the one hand, an inflammatory and excited condition is not produced; and if, on the other, the vital powers, though greatly sunk, are preserved from further sinking, we have an indication that stimulants are to be continued in their original, or in increasing doses.

I may now state the conclusions to which we have arrived from our investigations of last year:

1. That the condition of the heart in typhous fever must be determined by the application of the hand and stethoscope, the pulse being an uncertain guide.
2. That a diminished impulse, or a complete absence of impulse, occurs in certain cases of typhous fever.
3. That in such cases we may observe a diminished first sound, or even an absence of the first sound.
4. That both these characters may exist with a distinct pulse.
5. That although in most cases the diminution of the impulse and first sound coexists, yet that impulse may exist without corresponding first sound, and conversely, that the first sound may be heard although unaccompanied by impulse.

6. That these phenomena are most evident as connected with the left side of the heart.

7. That when the impulse and first sound are lessened or lost, the return to the healthy character is observed first over the right cavities.

8. That in some cases both sounds are equally diminished.

9. That in a few cases the first sound preponderates.

10. That these phenomena indicate a debilitated state of the heart.

11. That they may occur at an early period of the disease, and thus enable us accordingly to anticipate the symptoms of general debility.

12. That the existence of these phenomena, in a case of maculated adynamic fever, may be considered as pointing out a softened state of the heart.

13. That this softening of the heart seems to be one of the secondary local lesions of typhus.

14. That the diminution or cessation of impulse, the proportionate diminution of both sounds, or the preponderance of the second sound, are direct and nearly certain indications for the use of wine in fever.

I cannot conclude this paper without bearing testimony to the singular zeal displayed in this investigation, by many gentlemen who fulfilled the duties of clinical clerks during the last year. To Dr. Bovelle, of Barbadoes, and Mr. K. Kowalewski, of Warsaw, I am deeply indebted. And I beg also to mention the names of Messrs. W. M. Murphy, Thomas Moore, James Brady, Thomas Rogers, and W. Barrington, gentlemen whose practical knowledge of medicine, charity to their patients, and devotion to science, have earned for them the respect and admiration of all who were cognizant of their unostentatious exertions and untiring zeal.