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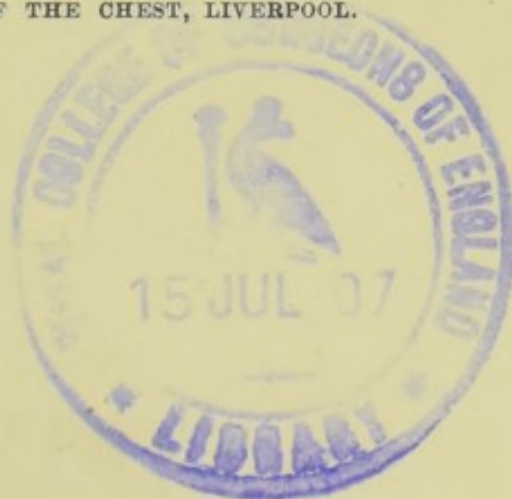
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TWO HUNDRED CASES OF
ACUTE LOBAR PNEUMONIA

BY

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200 CASES OF ACUTE LOBAR PNEUMONIA.

THE following paper is based upon the observation of over 200 cases of acute lobar pneumonia. I have confined myself more particularly to a series of 150 cases upon which I made notes and kept a record of the treatment. These observations and notes were made in the years 1899 to 1901, while I was acting as assistant medical officer in Mill-road Infirmary, Liverpool, and I would like to avail myself of this opportunity to thank Dr. Nathan Raw for kindly allowing me to make use of this material.

There is no intention on my part of describing pneumonia as a clinical entity—this has been done frequently by those much more fitted for the task than I; nor do I propose to lay before you the result of any laboratory research into any special feature of the disease, but while in daily contact with this large number of cases certain points in the diagnosis, prognosis, and treatment impressed themselves upon my mind and I am here attempting to put these points before you in the hope that I may have the benefit of your much larger experience. Much of what follows is probably not new but is to my mind insufficiently emphasised in the literature; some is heterodox and to it I beg your attention and a sympathetic attitude, for it is with much diffidence that I am here to support what I know is unorthodox.

It is essential that we should from the first have a definite conception of the type of case which has been under observation. The following statistics will show us almost at a glance. In 150 cases there were 33 patients below 20 years of age, with a mortality of 9·1 per cent; 89 between 20 and 50 years of age, with a mortality of 41·5 per cent.; and

¹ A paper read before the Liverpool Medical Institution on Nov. 19th, 1903.

28 over and including 50 years of age, with a mortality of 75 per cent. The total mortality was 61, or a death-rate of 40·5 per cent. 21 of these patients, or one-third of the fatal cases, were admitted moribund and died within 24 hours of admission. On eliminating these there are still remaining 129 cases with 40 deaths, or a mortality of 31 per cent.

Alcoholic excess is recognised as one of the most important of the etiological factors in pneumonia, and in this series it is much in evidence. In 65 of the 150 cases a history of alcoholic excess was obtained; in other words, 43·3 per cent. of the total admissions had taken alcohol to excess. Of these 65 patients 37 died, giving a mortality of 57 per cent. among the alcoholics. Looking at it from another point of view we find that amongst the 61 fatal cases 37 were excessive drinkers, that is 60 per cent. of the total mortality. Everyone knows how difficult it is in many cases to obtain a history of alcoholic excess, therefore in all probability the proportion of alcoholics is still larger. These patients were paupers with their powers of resistance greatly lowered in many cases by alcohol, underfeeding, overwork, and exposure. Such was the material which I had the privilege of observing—the class of case which teaches most, for it requires every possible therapeutic aid. All will admit that many cases of pneumonia are such that the patients get well with almost any, or even perhaps in spite of, treatment; some, on the other hand, are doomed to death from the first, so malignant is their attack, and it is really only that small number of cases in which the question of the fate of the patient is in the balance which offers the greatest scope for treatment and where one feels that careful, accurate, and prompt measures turn the balance in the patient's favour.

Physical examination of the patient.—Everyone admits that the general clinical signs of pneumonia are of more importance in the diagnosis than mere local physical signs and it would be futile here to enumerate the typical symptoms and clinical signs of an acute case, but there are several points of practical value which I feel are worthy of mention. Admitting that we must from the first take every care to spare the heart, still there can be no doubt that a careful, thorough examination should be made not only at the first but also whenever there is the slightest fear or doubt as to the changes and processes taking place; more especially do I

believe this to be necessary towards the end of the first week. In order to simplify this examination I am convinced of the value of a shirt open not only in the front of the neck but also down the whole length of the body. With a shirt of this kind the front of the chest, the abdomen, and the axillæ can be bared without moving the patient. There is too much hesitation in laying bare the chest, the axillæ, and the abdomen, at any rate in males. The fear of such patients "catching cold" is groundless and the great advantage of exposing the whole area to view at the same time is obvious. After a careful examination of the apices in front with the arms lying by the side, the patient should be asked to place both his hands well above his head; in this position both axillæ are easily examined and I am confident that there is no part of the chest which lends itself more readily to examination or which better repays careful attention. In the right axilla you have a portion of all three lobes and I have noticed the frequency with which any doubt in diagnosis is cleared up by careful auscultation and percussion of this part of the chest. If the pneumonia is basal in site the lesion almost always approaches the great fissure as it runs across the axilla and one can demonstrate the definite change of note on percussing from the middle or upper to the lower lobe. If the upper lobe be diseased it is easily examined from the axilla, extending as it does from the fourth rib up to the apex of the axilla and covered with a minimum thickness of chest wall, whilst if the examination be made from the front you have the pectoral muscles, and if from behind the scapular muscles, interfering with its examination. When the pneumonia happens to be central in position the physical signs usually show themselves first in the axilla and are late in appearing. This delay in the appearance of the physical signs of consolidation may, however, be a feature in a case quite apart from the existence of central pneumonia. If the toxæmia be very severe and the patient delirious, with bloodshot eyes, it is occasionally not at all easy to diagnose the condition from that of typhus fever and then any physical signs pointing to commencing consolidation are important. In several such cases I found that as the consolidation approached the surface in the axilla the first changes to be noticed were the appearance of a tympanitic quality about the percussion note and a diminution of the breath sounds, together with a prolongation of the expiratory murmur. This diminution of the breath sounds, one of the most important of the early signs

of pneumonia, is probably due to an engorged condition of the lung interfering with the normal elasticity "and consequently much restricted respiratory expansion." This is noted by Lewis A. Conner and George E. Dodge² in a paper to which I will refer later. On examining the back when the pneumonia is affecting the lower lobe the physical signs are most often well marked about the seventh, eighth, and ninth spaces just within the angle of the scapula, and when examining with the patient on his side in the early stage of the disease before consolidation is well defined it is well to remember that the side which is uppermost nearly always yields to percussion a higher pitched note. This is probably due to the fact that when one percusses the upper side one is percussing on to the spinal column, whereas on percussing the under portion of the back the bed will tend to act as a resonator and so yield a fuller note. When in such a case there is any doubt as to the cause of the impairment of note one of two things must be done—either you get the patient to sit up and to lean forward, which is undoubtedly the best method so long as the patient is sthenic and vigorous, or you have the patient lying first on one side and then on the other, and in that way check your first impression. As medical tutor to the Royal Infirmary, Liverpool, I have pointed out this difficulty to the students for the last three years and was much interested to find it discussed in the *American Journal of the Medical Sciences* by Lewis A. Conner and George E. Dodge, apparently their communication being the first mention in the literature of this peculiarity. I had already written my paper when I read their article and am glad to support their statement.

In the examination of the heart I found it very useful after having carefully percussed out the deep cardiac dulness to mark it out with a piece of lunar caustic. This is done at the first examination; the marks persist and are of the greatest help in showing any alteration in the extent of the cardiac dulness due to the disease, whether the change in dulness be due to dilatation of the heart, pericarditis with effusion, or displacement of the viscus.

Fortunately the anterior margins of the lungs very frequently escape consolidation; it is therefore generally possible to define the right and left margins of the heart with some degree of certainty. It is perhaps hardly necessary to say

² American Journal of the Medical Sciences, vol. cxxvi., p. 389.

that the deep dulness is best obtained by very light and delicate percussion.

The circulation in pneumonia.—The heart is the organ around which most of the anxiety in an attack of pneumonia centres. The signs of cardiac failure are the danger signals and treatment is practically from the first to preserve and to strengthen the cardiac muscle. The times of strain are two : first, during the onset of hepatisation, when there is a sudden diminution in the capillary area in the lung. In its effect on the heart this may be compared to a rapidly produced stenosis of the pulmonary artery, the right ventricle probably dilating to meet the sudden strain. The second begins any time after the fourth or fifth day up to the crisis and even following the latter. It is due to the toxæmia and the continued high temperature, both of which causes produce granular degeneration of the myocardium affecting the whole musculature of the heart. Strain is also present if the patient is violently delirious, the struggling and the necessary restraint most seriously exhausting the already handicapped heart. Rapid and extensive solidification of the lung, pyrexia, toxæmia, and the struggling of delirium may induce fatal cardiac asthenia even in a heart which at the onset of the pneumonia was sound ; still more readily is this condition induced when the heart at the beginning of the attack is below the normal from any cause.

The most serious lesions from the point of view of prognosis are those which attack the myocardium. I feel confident that simple valvular disease, quiescent and amply compensated, where you have a good area of cardiac response from a healthy myocardium, will only in a small degree increase the gravity of the prognosis ; whereas nothing could be more serious than pneumonia where the heart muscle is flabby and degenerated even although the valves are normal. In the first case, however, there is probably an obvious murmur which arrests attention and may cause undue alarm, while in the second the absence of any murmurs may cause the much more serious cardiac condition to be overlooked. In this respect chronic alcoholism, either with or without arterio-sclerosis, is a most serious etiological factor, not only because of the unstable nervous system with which it endows the patient but also because of the degenerative changes produced in the heart and more particularly in the right ventricle. As already stated, the death-rate

among those admitting to excess in alcohol was 57 per cent., and it is highly probable that this was in a great measure due to the degenerated condition of their myocardium, though the diminished power of resistance to infection and consequent virulent toxæmia should not be ignored. Let us with these considerations in our mind briefly examine those cases which showed definite valvular lesions.

Mitral regurgitation.—There were seven cases in which there was a systolic murmur loudest at the apex and conducted towards the axilla. This murmur persisted throughout convalescence or was proved post mortem to be due to mitral incompetence. In these seven cases there were two deaths. One was of a woman, aged 74 years, whose pneumonia was simply a mode of dying (she also suffered from chronic interstitial nephritis, chronic bronchitis, and emphysema); the other fatal case was that of a woman, aged 44 years, addicted to drink. Her pneumonia was associated with acute rheumatism. She reacted very feebly to the pneumonia and died some days after the crisis, having been in a condition of low delirium. In the five cases in which the patients recovered the mitral regurgitation had little effect on the course of the disease with this exception that in some cases resolution appeared to be delayed.

Mitral stenosis and regurgitation were present in four cases, the respective ages being 16, 17, 32, and 47 years. The patient aged 47 years died. She had previously been an in-patient suffering from emphysema, bronchitis, and cardiac failure. A month before her death she was admitted with right hemiplegia and aphasia due to cerebral embolism. She contracted a low form of pneumonia while in hospital and died on the seventh day of the disease. The necropsy revealed grey hepatisation of the left upper lobe, marked general emphysema, extreme mitral stenosis with calcification of the mitral cusps, and some early pericarditis. In one of these four cases the deep cardiac dulness extended two and three-quarter inches to the right and for three days the pulse-rate oscillated between 120 and 135 per minute. In this case the left lower lobe was involved. In the patient aged 16 years the pneumonia was double and in the third, aged 32 years, there was pneumonia of the right lower lobe; in this case the pulse was extremely small and irregular. In two of these three cases resolution was much delayed; otherwise they ran a fairly normal course.

From a consideration of these cases I think one is justified in the assumption that mitral disease is not in itself of great moment. That it lessens a patient's chance of recovery and also probably delays resolution one must admit, but that is all. In those cases which were fatal described above the mitral lesion was obviously only a small factor in the causation of death.

Pericarditis.—Of much greater moment is pericarditis. I found it to be a most serious complication probably because it is so potent in damaging the myocardium, especially that of the right ventricle, and also from the fact that it is sometimes simply a terminal event in a severe case, or again it may be, and I believe frequently is, a symptom of the severity. There were nine cases complicated with pericarditis; six of these died. In two serous effusion was present; both recovered. There was purulent effusion in one case and that fatal. I did not meet with any patient in whom there was adherent pericardium but consider that a lesion of that type must very greatly handicap the heart on account of the associated changes in the ventricular walls. Fusiform dilatation of a calcareous aorta was discovered post mortem in one case and malignant endocarditis in another.

Cardiac failure.—As signs pointing to heart failure and indicating the need for treatment, the following were the points to which I paid special heed. First, the general appearance of the patient. So long as the capillaries of the cheek and face are full of well aerated blood and the cerebration is active and not dulled by delirium the heart is probably doing well. Pallor of the face, empty capillaries, and low delirium indicate cardiac exhaustion. If the respirations increase in number and become shallow and if at the same time râles appear in the previously clear lung the cardiac failure is marked and the condition is grave. The signs which one obtains by a careful physical examination of the heart pointing to cardiac failure are those usually recognised—an increase of cardiac dulness especially to the right—and here the marks made with the caustic on the first examination are of considerable help. Alteration in the character of the heart sounds: at the apex and tricuspid areas a weakening of the first sound, at the pulmonary a muffling and softening of the second sound, which sound in favourable cases is commonly accentuated and frequently reduplicated. Later the veins in the neck become congested

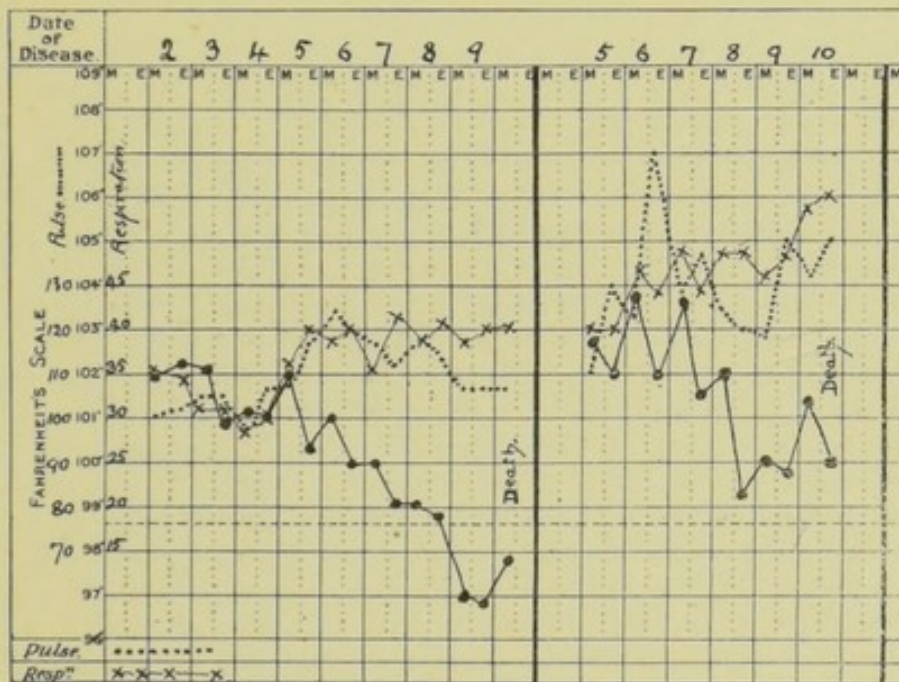
and there is increased epigastric pulsation. Personally the signs I looked to as indicating the first appearance of heart failure were alteration in the pulmonic second sound and in the first sound at the mitral and tricuspid areas together with an increase in the deep cardiac dulness to the right. A note should be made daily of the deep cardiac dulness.

Pulse.—There is some difference of opinion as to the value of the pulse in prognosis but there is no doubt as to the help it gives in the interpretation of the condition of the heart and vessels. In relation to the pulse in pneumonia I would like to note the following points :—

Tension.—A very soft compressible pulse with poor percussion wave early in the disease is ominous and if on making a sphygmograph there is only a slight dirotic wave recorded one may take it that the myocardium is feeble and the prognosis is correspondingly grave. Frequency varies safely within considerable limits, but a pulse-rate of over 130 per minute for 48 hours in an adult is generally associated with a fatal issue. Normally the pulse rate begins to drop some hours before the fall in temperature which it anticipates. If, however, during several days the rate of the pulse and the respirations slowly increase in frequency, while at the same time the temperature steadily falls, one may expect a fatal issue, even when the patient appears in other respects to be progressing favourably (see chart). Irregularities in the pulse interested me greatly and I would like to note that even in fatal cases this variation from the normal occurs much less frequently than one would expect. One often finds recorded in such cases that "the pulse is regular in force and frequency, very small volume, and of poor tension," or that "the pulse is very frequent and its tension low." Only quite rarely, except within 24 hours of death, is irregularity or intermittency of the pulse recorded. Irregularity may occur at any period of the fever and is of least moment in the old or at the crisis. Mackenzie of Burnley³ says: "In all cases of acute lobar pneumonia that I have met when the pulse showed even an occasional irregularity before the crisis was reached death supervened." This has not been quite my experience, for I have notes of five cases in which there was intermission or irregularity of the pulse found before the

³ Mackenzie : The Pulse.

crisis and in which the patient recovered. In one, a pneumonia complicated by advanced mitral stenosis, the pulse was extremely irregular and small in volume throughout the whole attack. This was entirely due to the stenosis and persisted during and after convalescence. In the spring of this year I watched a case of pneumonia in Dr. Barr's male ward in the Royal Infirmary, in which the patient's pulse became markedly irregular and persisted so for three days. He was in a condition of low delirium but under active and vigorous treatment recovered. This makes six cases which



have come under my notice and although I cannot go quite so far as Mackenzie I hold with him in the main. One may say, therefore, that if the pulse in the early days of the attack has a frequency at or over 120 beats per minute, is small, soft, and compressible, or is irregular, then the outlook is extremely grave.

Treatment.—Rational treatment depends on a thorough comprehension of the pathology of the disease and a knowledge of its course. It still more depends on an early recognition of those physical signs and symptoms which indicate the onset of conditions dangerous to the patient. The danger signals in pneumonia are those which indicate severe

toxæmia or the onset of cardiac failure. Toxæmia and cardiac failure being the two most common actual causes of death a discussion on treatment really resolves itself into the consideration of these conditions. So long as there are no signs of severe toxæmia and no indications of cardiac weakness, general treatment, careful dieting, and good nursing are all that are required. In such cases the medicinal treatment makes very little difference so far as the ultimate result is concerned, though the comfort of the patient may be greatly influenced by appropriate means which, however, do not fall to be considered here.

Before dealing with the question of the treatment of cardiac failure it will be advisable to discuss the means of preventing its appearance. This must be accomplished by peaceful and quiet surroundings, a good supply of fresh air, no unnecessary movements, the relief of pain, and the prevention of any interference with the action of the diaphragm. Sleeplessness, struggling associated with delirium, and flatulent distension of the abdomen are, in my opinion, three of the gravest conditions to be dealt with. The first produces general nervous and physical exhaustion and may end in the production of an asthenic or typhoid state. The second may rapidly induce grave cardiac failure. The third adds considerably to the work of the heart. Continued insomnia is almost fatal and much may be done in the early days of the disease to comfort and to ease the patient and so induce refreshing slumber. Cold or tepid sponging is especially soothing and at the same time tends to lower the temperature. A poultice of linseed and mustard applied to the side may induce sleep by relieving the pain of pleurisy; this pain is generally sharp and stabbing and is increased by breathing, in contradistinction to the dull, continuous, aching pain felt during the first few days either alone or contemporaneously with the pleuritic pain. This dull pain is due to the distension of the visceral pleura and capsule of the lung and is frequently relieved by the application of ice bags placed over the engorged and distended lobes. Paraldehyde in doses of two or three drachms was occasionally useful in the alcoholic cases. It is somewhat objectionable to take and can be given either in mucilage with syrup of orange and peppermint or with a small quantity of brandy. It does not depress the heart. I did not find the chloral and digitalis mixture efficient unless given in such large doses that one feared for the depressing

action of the chloral. When these methods fail I believe the best drug is opium and think that before the fifth day there is rarely any need for hesitation. Dover's powder is commonly used, but I found that it so frequently caused vomiting that I preferred to give a hypodermic injection of morphine. The rules that I followed with regard to the exhibition of morphine in pneumonia were as follows. Sleep must be obtained and some risk may justifiably be incurred to procure it. First employ simple means; those failing, inject morphine. Morphine is usually safe up to the fifth day, especially if the pupils are dilated, and it is less dangerous to the patient than the wild struggling of delirium. The wild delirium occasionally accompanying the crisis should be controlled with morphine. Morphine is dangerous if there be marked cardiac failure, if the lungs are full of bronchitic râles, if there be commencing œdema in the previously dry lung, and especially if the patient is suffering from chronic renal disease. In the almost maniacal delirium of crisis above mentioned morphine is the only drug which can be relied on and must be injected without any delay. I well remember one man, an alcoholic, on the eighth day of his pneumonia, with flushed face and dilated pupils, kneeling on the bed and struggling with the sister and two nurses. He was attempting to get out of the window. I injected a quarter of a grain of morphine and $\frac{1}{100}$ th of a grain of atropine. He was shortly asleep; his temperature dropped to normal and there remained. Whatever rules one may have as guides this question will always be one to give rise to the most anxious thought and careful consideration. When it has to be decided whether in a certain case one is justified in taking a definite risk to obtain a possible and hoped for gain, generalisations often fail and the case must be settled on its merits.

Another condition fraught with danger to the heart is that of distension of the abdomen. This impedes the downward movement of the diaphragm and thus interferes with what Dr. Barr has described as the respiratory pump, the result being that this important aid to the passage of the blood through the lungs and heart is lost and the whole work is thrown on to the right ventricle. The distension causes pressure directly on the heart through the diaphragm and so adds yet another difficulty to the cardiac action. There are two common causes of distended abdomen—first, flatulence caused by the over-ingestion, and consequent fermentation, of food, especially milk; and, secondly, a paralytic distension

of the intestines due to the virulence of the toxæmia. For the first it is essential to cut down the quantity of food, especially milk, and advisable to give a dose of calomel, say, from two to five grains, by the mouth. This should be followed by repeated doses of some antiseptic such as tincture of iodine and glycerine as recommended by Dr. Barr,⁴ or 10 minims of glycerine of carbolic acid. I would now feel inclined to use sodium taurocholate in five-grain pills thrice daily, having found it most serviceable in some cases of intestinal flatulence. The above treatment, supplemented with a turpentine enema, is usually efficacious. Paralytic distension is much more difficult to relieve and more can be done by general than local treatment, though here also calomel is of value followed by enemata.

We will now consider what is to be done when the pulse becomes more frequent, smaller in volume, lower in tension, possibly intermittent or irregular. At the same time there is an increase of deep cardiac dulness to the right and the sounds of the heart are noticed to be feebler. The answer of orthodox medicine to-day is that these are the indications of commencing cardiac failure and that cardiac failure must be anticipated by cardiac stimulants, more especially in pneumonia by alcohol. I do not agree with this conclusion and hope to give you good reasons for my view. That these signs are the signs of cardiac failure is true, that a cardiac stimulant or tonic is required is evident, but to exhibit alcohol would, I believe, be unsound treatment. Alcohol has its place in the treatment of pneumonia both during the acute stage and convalescence, but I do not believe that its rôle is that of a cardiac stimulant, for as Sir Samuel Wilks says in speaking of it⁵: "It is difficult to know why such a remedy is called a stimulant. From the change of name to sedative I have got much practical good."

You must all have noted the steady change of opinion in the profession as to the value of alcohol in pneumonia. At the present time nearly every writer warns his readers of the danger of overdosing patients with alcohol and the necessity of withholding it as long as possible. Out of many possible instances may I quote one. Burney Yeo,⁶ says: "The routine

⁴ James Barr: *Pneumonia*, Brit. Med. Jour., June 9th and 16th, 1900.

⁵ *The Practitioner*, November, 1902.

⁶ I. Burney Yeo: *Manual of Medical Treatment*, vol., i. p. 581.

administration of alcohol in pneumonia, especially in the early stages with the idea of preventing cardiac failure later is, we think, a serious error. Alcohol produces vasomotor paresis and causes dilatation of the vessels and *it must therefore aggravate or induce tendencies to vascular engorgement.*" (The italics are mine) "It acts like a poison to many persons and causes considerable nervous and general depression after its first stimulating effect passes off; it increases the amount of toxic substances in the blood and the elimination of considerable quantities of alcohol must impose a severe strain on the already overtaxed organs of excretion." That, in the light of the views held by Todd and his followers, is indeed a great advance. Even in 1900 in this institution I heard a member state that he always put every "pneumonia" on six ounces of brandy in the 24 hours, together with ammonium carbonate and digitalis—routine treatment with a vengeance! There was a time when it was customary to bleed pneumonias and when this method of treatment was supported by all the acumen and experience of the lights of medicine. The public at that time held the same views and history records that a medical man was sued for damages on the ground that he had caused the death of his patient by neglecting to extract the customary ounces of blood. A different version of the same story occurred recently. This time an action for damages was taken out against a physician on the death of his patient because the patient had not received alcohol. The public used to swear by bleeding, now they swear by brandy. The profession have put venesection into a secondary position in the treatment of pneumonia and already they have begun to modify very considerably their views as to the value of alcohol.

The action of alcohol on the circulation is briefly as follows. Its primary action is on the mucous membrane of the mouth, œsophagus, and stomach, and in virtue of this action it undoubtedly acts reflexly as a cardiac stimulant. This stimulation is neither prolonged nor powerful. After its absorption alcohol exerts its specific action—dilating the peripheral blood-vessels and lowering the blood pressure, thus tending to empty the arteries and to fill the veins. On the heart itself, directly, alcohol seems to have no effect at all; in large doses it enfeebles it.⁷ Such is the opinion of

⁷ John C. Hemmeter: Studies from the Biological Laboratory of Johns Hopkins University, 1889, vol. iv., No. 5,

Professor C. S. Sherrington. Its action on the centres in the bulb is from the first depressant. As a food it need not be considered. It is not given as a food. The indications for its exhibition, according to those who advocate it, are those of cardiac failure and it is given to meet that failure. It is oxidised in the body and therefore does give rise to heat and energy but this is of secondary importance. It is undoubtedly given for its specific action on the circulation and nervous system. Bearing these facts in mind, in what way may alcohol be employed with advantage in pneumonia? The total action of alcohol on the heart being depressant it is futile to give it in cases of commencing cardiac failure with the idea that you are combating that failure by giving a specific cardiac stimulant. The peripheral vessels are, as a rule, sufficiently dilated in response to the pyrexia and there is no useful object to be gained by further dilating them with alcohol. During the initial rigor, when the peripheral vessels are all contracted and there is marked internal congestion, relief and comfort may be obtained by suitable doses of alcohol in the form of hot drinks; or again occasionally after the crisis during the period of convalescence small quantities of alcohol might be used with benefit to prevent contraction of the peripheral vessels and consequent strain on the enfeebled heart.

I think there is some ground for the belief that chronic alcoholics take their nourishment during the fever with more comfort and satisfaction if at the same time they receive a small quantity of spirits and water, though Sir William Broadbent says that "in no cases should they be given in the early stages even when the patient has habitually taken alcohol in excess and may be thought to have become dependent upon it; the safer plan is to withhold them until it is clear that they are necessary." I have seen persistent vomiting initiated by brandy on several occasions in those previously unaccustomed to spirits. The narcotic action of alcohol is occasionally of value in securing sleep and is best given either as recommended by Sir Douglas Powell combined with infusion or tincture of digitalis or in conjunction with a small quantity of morphine given hypodermically. These are the conditions in which, in my opinion, alcohol can be given with benefit. To exhibit it in the quantities so commonly ordered in serious cases is, as Burney Yeo wisely points out, to hasten that very condition of cardiac asthenia which it is our one aim to prevent.

We have not time to consider the toxic effects of alcohol on the protoplasm of the heart muscle accentuating the degenerative changes inaugurated by pyrexia and toxæmia; its action in binding the oxygen more firmly to the hæmoglobin, thus preventing the fullest supply of oxygen to the tissues; its action in shortening diastole or the resting period of the heart's muscle; or its action in interfering with the nutrition of the heart muscle by diminishing the flow of blood in the coronary arteries and the elimination of waste material, both of which take place mainly during diastole. All these factors, slight in themselves, tend to the production of cardiac failure. I quite realise that I shall be met with the query, "To what end are all these statements when we know what pneumonia is? We have seen patients live who but for alcohol would have died; we have given alcohol and watched its effects; we are convinced it is a cardiac stimulant." My answer to this is that these convictions are based upon statements and observations which have not been subjected to a sufficiently searching criticism. Tradition is largely responsible for these beliefs and arguments of the *post hoc propter hoc* type have perpetuated them.

At the present time there are two factors which act most powerfully in prolonging the life of the orthodox views as to the administration of alcohol. The first is that students are biased from the very beginning—very few have ever seen a severe pneumonia treated without alcohol and, in fact, I might say that the same holds good amongst qualified men, only a small percentage of whom have watched or treated cases of grave pneumonia in which alcohol was not administered. A student becomes qualified and enters on practice believing that he must administer alcohol under certain conditions. In the majority of instances not the shadow of a doubt ever crosses his mind as to its efficacy and the result is that if the patient lives after the exhibition of large doses of brandy he believes that the brandy was largely instrumental in the recovery, whilst if the patient dies he consoles himself with the thought that everything possible had been done to prevent the fatal issue. The second factor is possibly even more potent, though I hardly like to mention it. The general public believe in brandy. It is "the stimulant," and if a friend or relative is seriously ill they are never happy unless brandy or some other alcoholic drink is ordered. It takes a strong-minded medical man to withstand this, and although one may not care to admit it lay opinion in

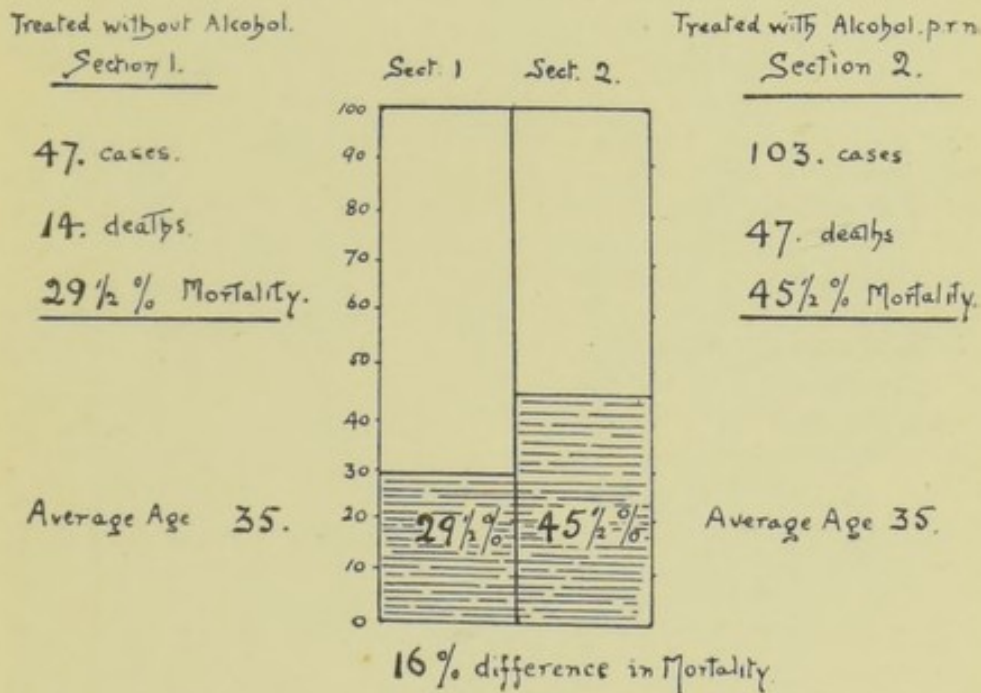
this matter cannot but have a far-reaching effect. Unless a man has very definite reasons for preferring to do without alcohol in the treatment of a case he will naturally yield to the openly expressed desires of the patient's friends and relatives. When anyone considers alcohol a necessity, exhibits it on the first appearance of an unfavourable sign, and consistently follows this line of treatment in blind faith, I hold that the value of his opinion must be much impaired, for his experience is hopelessly one-sided—he knows only one aspect of the question. One must admit, I think, that the above describes the majority of men practising at the present time. That the medical men take its value for granted and the general public demand its exhibition are, in my opinion, the two factors which are chiefly responsible for the persistent belief and faith in alcohol as a cardiac stimulant. I will admit that for two years after being qualified I could not conscientiously have treated a serious case of pneumonia without ordering alcohol. One of my teachers, a man for whose opinion I still have the very highest respect, taught me that the treatment of pneumonia was, in brief, “bed, poultice, and stimulants according to the pulse,” and that treatment I followed.

In 1897, when house physician in the Royal Infirmary and later at Mill-road Infirmary, I carefully watched the effect of alcohol in pneumonia and my faith in its efficacy as a cardiac stimulant slowly began to be shaken. In fact, I began to wonder whether it was not even detrimental to the patients to receive alcohol in the orthodox quantities. While acting as assistant medical officer in the latter infirmary I had the opportunity of carrying out a line of treatment in which the patients did not receive any alcohol and I now lay before you the results.

The 150 cases to which I have already referred and on which this paper is based are divided into two sections. The first is composed of 47 cases. These were not in any way selected. Every case that came in on certain days was included in this section and came more especially under my care. Throughout they received no alcohol. In the second section are included 103 patients who were admitted on the remaining days of the week and who were placed under the care of the other assistant medical officers. They received alcohol when the ordinarily accepted indications for its use arose. The patients in each section were of the same type, they were drawn from the same districts, and were attacked at the same seasons of the year.

The nursing was much the same throughout the hospital and the food came from a common kitchen. Under such similar conditions if we find that any particular line of treatment gives exceptionally good results in a large series of cases one is justified, I think, in ascribing to it some proportion of the success. The result in these 150 cases was definitely, one might say startlingly, in favour of that treatment in which alcohol was not administered. It is a common saying that anything can be proved by means of statistics, but I am unable to see how the most ardent

TABLE I.
COMPARISON of the RESULT of TREATMENT



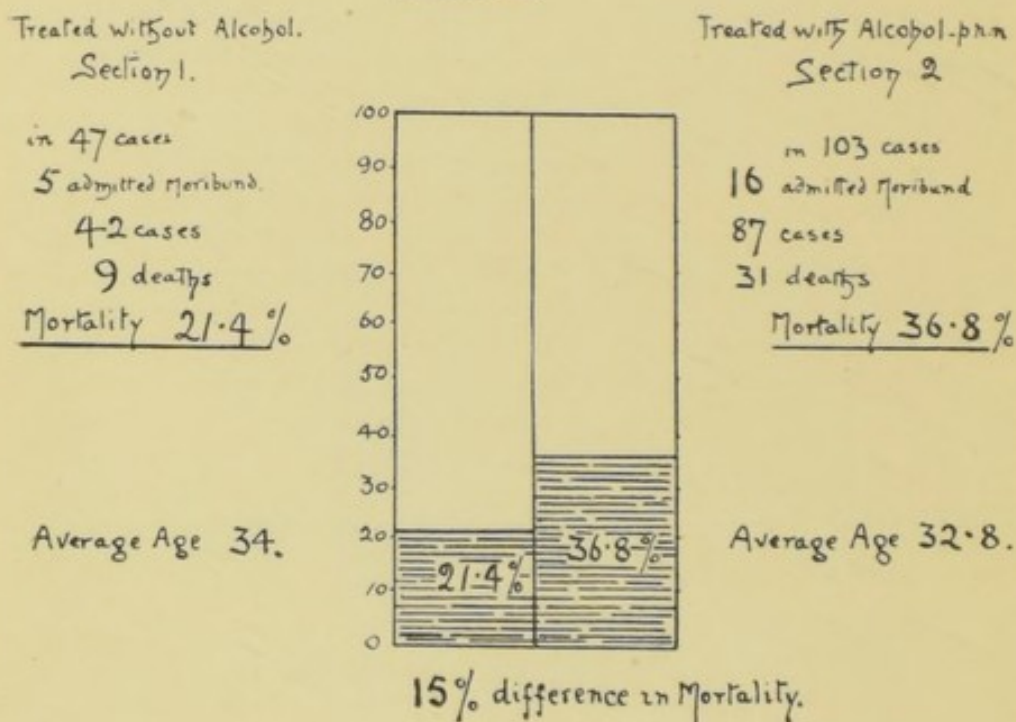
advocate of alcohol as a therapeutic agent can fail to be impressed by the result of withholding it in the above series of 47 cases. There is no desire on my part to juggle with figures. I have taken great care in drawing up these tables to eliminate every source of error and am content to allow the tables to speak for themselves. It has been put to me that possibly some of the patients in Section 1 might have been saved if only they had been given alcohol. That, of course, cannot be contradicted, and possibly if I were now to treat those cases there might be occasions on which I would

exhibit alcohol following those indications for its use which I have laid down. As a matter of fact, however, practically all those conditions in which alcohol may be used can be efficiently met by other drugs. And for the purpose of comparing the results it was obviously wiser to eliminate alcohol entirely from the treatment.

The tables have been drawn up to show at a glance the relative mortality in the two sections. Table I. shows a mortality of 29.5 per cent. occurring in those treated without

TABLE II.

COMPARISON of the RESULT of TREATMENT.
after the Elimination of those admitted
Moribund.



alcohol as compared with 45.5 per cent. in Section 2, giving a difference in mortality of 16 per cent. This was such an astonishing difference that I thought it might possibly be due to a larger preponderance of patients admitted moribund into Section 2 than into Section 1. Table II. shows the result of eliminating from the statistics all those dying within 24 hours of admission. The mortality in Section 1 then becomes 21.4 per cent., and in Section 2 36.8 per cent.—a difference in mortality of 15 per cent. As

the death-rate varies so much in the different age periods I have compared the two sections from this standpoint and find that before eliminating the moribund cases the average age in each section was 35 years, whilst after eliminating those dying within 24 hours of admission the average age in Section 1 was 34 years and that in Section 2 was 32·8 years. We note, therefore, a difference of 15 per cent. in the mortality remaining after the elimination of the moribund cases—the two sections having for all practical purposes the same average age. There may possibly be, and probably there are, several causes for this variation in death-rate. Chance itself may account for some of it, but the obvious and outstanding cause is the administration of alcohol in one section and its non-administration in the other, and I believe that it is this factor which is largely responsible for the difference in mortality.

The drugs which we used in order to prevent or to counteract cardiac failure were practically four: strychnine, digitalis, caffeine, and ammonium carbonate. Strychnine and caffeine are recognised as good stimulating cardiac tonics. Digitalis is a more purely cardiac tonic. In the administration of strychnine one must be careful neither to begin too soon nor to give too large doses, for it must be remembered that there is only a certain definite reserve force in each heart that can be called upon. The main object must therefore be to spare the heart from every strain and only to use cardiac stimulants when absolutely necessary. Both strychnine and digitalis I preferred to administer hypodermically and when given in sufficient doses they will obtain from the heart a large proportion of its possible energy. In alcoholic cases more especially is it advisable to give digitalis hypodermically because, as O. T. Osborne⁸ points out, digitalis is absorbed with great difficulty from the stomach in such patients. Digitalis slows the heart and simultaneously increases the force of its contraction, tending to raise the blood pressure by contracting the peripheral vessels.

As an example of the value of digitalis in contradistinction to alcohol in its action on the heart Sir Samuel Wilks relates a very suggestive case.⁹ "A young lady, for many years the subject of mitral disease, had been for some time growing worse until at last she took to her bed" and he was asked to

⁸ O. T. Osborne: What ought we to expect from Cardiac Drugs in Heart Weakness? *Medical News*, 1903, vol. lxxxiii., p. 541.

⁹ *The Practitioner*, November, 1902.

see her. "It was a matter of formality as she was thought to be dying. She was lying in bed gasping, with a fluttering heart and an almost imperceptible, irregular pulse, and semi-conscious. She was being plied with brandy in order to keep her alive. The two medical men who were with her did not perceive that they were poisoning her but nevertheless assented to my strong wish to stop the spirit. This was done and 15 drops of tincture of digitalis were to be given every hour for a short time. After a few doses the frequency of the pulse was lessened. She breathed better and was more sensible. She then continued the remedy to a less amount. She rapidly improved."

Strychnine stimulates the cardiac centre, cardiac ganglia and nerves, and also in a marked degree the respiratory centre. One-fiftieth of a grain was given every four hours if any signs of cardiac exhaustion were observed and, if necessary, this dose was increased to $\frac{1}{25}$ th of a grain. Both camphor and musk, more especially the latter, must be looked upon as valuable cardiac stimulants, but the cost of musk is so great that it was impossible to make use of it. If given at all, I am told by those who have exhibited it, doses of from five to ten grains should be administered every few hours. Ammonium carbonate has been found chiefly of use in those cases associated with bronchitis. It should be administered in large doses—ten grains every four hours and occasional doses of 20 or 30 grains in addition. It rarely produces emesis and is usually followed by very free expectoration. I first became convinced of the value of these large doses as an expectorant and cardiac stimulant in the case of a woman suffering from marked emphysema and bronchitis. She was propped up in bed, breathing rapidly, tossing about, distressed, and very cyanosed. Her heart was dilated and her pulse was irregular. Her lungs were full of râles and rhonchi. For some days she had been taking an ordinary expectorant mixture with very little benefit. I ordered her a half-drachm dose of ammonium carbonate, to be repeated in an hour if it had not produced emesis. Following the second dose she began to expectorate large quantities of muco-pus and was greatly relieved. Since then I have frequently tried these large doses and generally found marked benefit follow their exhibition not only in cases of bronchitis and emphysema but also in pneumonia associated with bronchitis in which the expectoration tends to be profuse and of a bronchitic character. Caffeine can be administered either as strong

coffee or as the citrate. It acts as a stimulant, cardiac tonic, as a nervine tonic and also as a cerebral stimulant. This latter property would make one hesitate to give it when the insomnia is troublesome. Its action on the kidneys may help to eliminate toxic matters.

There is one form of treatment to which I would like to refer in conclusion—namely, the application of icebags to the abdomen so strongly recommended by Dr. Barr.¹⁰ These were applied in some 20 cases and with benefit. The cold applied to the abdomen steadies the temperature and by acting on the splanchnic area improves the tension and volume of the pulse. It increases the depth of the respirations and thus greatly assists the heart by increasing the force of the respiratory pump. It also, according to some authorities, distinctly increases the value of digitalis in pneumonia by tending to bring the circulation into equilibrium.

If one determines to use the icebag it is most important that it should be firmly fixed, otherwise it will tend to slip down on to the groin and be a source of great discomfort. The sensitive groins should be protected with wool or lint. A medical man, a member of the Liverpool Medical Institution, has mentioned to me the comfort and benefit which he received from the icebag during an attack of pneumonia and he also referred to the discomfort which he experienced until his groins had been protected and the icebag firmly fixed in its correct position.

Liverpool.

¹⁰ Loc. cit.

