on a narrow gauge. I think that argument cannot be accepted. In the case of the railway, the object to be moved is supported on wheels, and is consequently subject to oscillation, and might be upset; whilst, with the leg-suspender, the object to be moved is suspended from the wheels, and is therefore at its lowest point of gravitation, and is always tending to keep the wheels upright. An example of the steadiness of a body supported on two wheels, side by side, compared with that on one wheel only, may be seen in the case of a two-wheel handcart and a wheelbarrow. With the former, comparative steadiness is observed during motion; whilst, with the latter, a lurch takes place, answering to the movements of the wheeler's body. If, however, there be any service in having more than one rail, my suspender is amply furnished, although not for the object just mentioned, for it has three rails—a central one, on which run trucks, as guides, and two side rails (the bearing-bars) on which slides the arm connected with the longitudinal truck-holder. It will be thus seen the longitudinal motion in my instrument is gained by means of sleighs and wheels. The transverse trucks and swivel-bar, combined, answer like a "tell-tale" or a safety-valve to every side movement of the limb, whether voluntary or otherwise, thus obviating all strain or shock which occurs to an object suddenly brought to. Concussion of opposed surfaces is also reduced to a minimum. This action is not only a comfort to the patient, but it plays an important part in the actual treatment of a diseased joint or a fracture. To prevent motion in a limb, or strain on a limb, there must be no obstacle to the voluntary or involuntary movement of a limb, horizontally, in any direction. So perfect is the rest thus obtained, that splints might almost be dispensed with; and fractures, hitherto considered beyond the pale of treatment, have by this appliance been treated successfully. In many cases of severe fracture of the leg, treated in the ordinary way, the surgeon knows he has to a great extent to thank the patient for the successful issue; by the penance he has endured in the shape of watchfulness and caution. The swinging motion is very slight, owing to the straps being mediately connected with lateral and longitudinal trucks, and not hanging from a fixed point. If necessary, even this slight undulatory motion might be obviated by having a rigid connection between the splint and the suspender instead of the yielding straps; but I do not think the substitution will ever be required, as the sensation is rather pleasant than otherwise. The moment there is any tendency to a swinging movement, the trucks begin to act. To gain a thorough lateral swinging motion, a swing must be suspended from a point which cannot be moved laterally. The patient should be instructed not to abuse the freedom thus given. Care should also be taken in seeing that the upper bedclothes do not touch the toes in any sweep the limb may make.

What is the result then, when a limb, fractured or diseased in its joints, is slung in an ordinary two-sided apparatus having only longitudinal action, and not embodying the advantages just set forth? Quite the converse. In the first place, if the apparatus be placed on a soft bed it sinks into the bedclothes, and causes the mattress to bulge up against the back of the leg, and thus to interfere with the free movement of the limb. This obstacle, when the limb swings against it, causes a jolt which is immediately felt in the part affected. Another objection to the narrow two-sided framework is, that one of the sides interferes with the comfort of the sound limb. In the next place, there being no transverse trucks, any voluntary or involuntary movement of the limb, sideways, is checked, thus causing a strong swinging motion and a lateral strain on the limb, which is sure to have an evil effect at the seat of injury or disease. Anything which hinders or impedes movement in a given direction is, for the moment, an opposing force.

Although my apparatus was designed for suspending fractured legs, it is evident it would be equally useful in any case requiring the removal of the "dead weight" of a limb from the bed, as in all fractures and diseased joints of the extremities, cases of resection, important wounds, gout, etc. When both legs are broken, I use my broad two-sided suspender, which covers both limbs, and has two sets of trucks on the transverse rail. In certain severe injuries of the upper extremity, where the patient is confined to his bed, suspension plays a useful part in the treatment. I have not had occasion to use my apparatus for such purpose in my own practice, but I was informed by Mr. Berkeley Hill, that it was used successfully in University College Hospital in a case of resection for ununited fracture below the elbow, when another mode of slinging had failed. The remarks I have made respecting the value of suspension in the treatment of fractures, are of still greater force when applied to the treatment of inflamed joints, where the slightest movement produces intense suffering. We all know there are many cases of simple fracture which do well without any special care, but even in such instances the suspension of the limb adds greatly to the patient's comfort.

A HOSPITAL AND ACCIDENT AMBULANCE SERVICE FOR LONDON.*

By BENJAMIN HOWARD, A.M., M.D., F.R.C.S.E.

It is now over seventeen years ago since the first ambulance system ever established had its earliest opportunity of proving its value as a distinct organisation. On that occasion, when over ten thousand men lay on the field about Antiatam, by the sudden disability of Dr. Letterman, the supreme responsibility was, by special order, placed upon me. Thus initiated in a work in which my interest has been active from then till now, it was, I can assure you, in no spirit of criticism I called attention, when in London three years ago, and again in the medical journals last July, to the manifest need of an ambulance system in this quasi-battlefield of London.

The Committee of the London Hospital having, upon my urgent representations, decided, last September, to adopt a hospital and accident ambulance service; and having now further arranged for a conference of the other general hospital authorities with themselves, within a few days, to be presided over by His Royal Highness the Duke of Cambridge, to consider the organisation of a hospital and accident ambulance system for London, it has been deemed of first importance that, in advance of this public meeting, the whole question be submitted to this Society, which so largely represents the profession of the entire metropolis.

As briefly as I may, therefore, after glancing at some general reasons for an ambulance system, I will allude to the pre-eminent force of these and other reasons when applied to this particular locality; will give some accounts of the different systems already in operation or adopted in other cities; describe the system recently initiated at the London Hospital; and lightly touch upon such points as are likely to invite special attention in the future determination of such system or systems, as may be practicable and best for this heterogeneous and unparalleled metropolis.

Some General Reasons for an Accident Ambulance System.—The influence of a right or wrong first care, and good or bad transportation, not only in surgical, but in many medical, emergency cases, towards determining the recovery or death of the patient, is not easy to exaggerate. In the present absence of system, the earliest diagnosis between apoplexy and "drunk and incapable" is made by the policeman. The treatment on the spot is as miscellaneous as the rival sympathisers can make it. As regards transportation, this, in two or three respects, has, since the middle ages, been slightly modified. The police-stretcher, or the shutter formerly carried by the hands, with the advantages of suspension, is now more usually borne upon the shoulders of unequal men, with the hoisting, lowering, jolting, risk, exposure, and fright, thus unavoidable. A wheelbarrow-litter has lately been occasionally used, in a description of which, under the head of "Police cruelty", the *Lancet* has denounced it as "worse than useless from every medical standpoint." A vivid description of the scenes attending an average transportation, in these ways, of a criminal or a patient, may be found in a pamphlet published last November by Mr. Harrison of Liverpool.

The other modification which I would fain not even mention is the cab, familiarly known as the "growler". In other respects, while the treatment of emergency patients within the hospitals has in every particular marvellously progressed, the provision for their first care on the spot, and their transportation to hospital, is in the main what it was a century ago.

Whatever the sex, age, rank, be the case one of cardiac syncope, or apoplexy; of fracture, dislocation, or "drunk and incapable", whether the one or the other of the means of transportation above mentioned be used, is left exclusively to the indiscrimination and convenience of the policeman. For the worst fracture in the most distinguished patient, there is no choice in removal except risking his reputation on the police-stretcher, or his life perhaps in the impossible cab.

For assurance against volunteer maltreatment of emergency cases and street accidents on the spot; against detention or rejection at the nearest hospital; for assurance that the first care shall be prompt, exclusive, skilful; that the transportation shall combine ease with seclusion, the only resource according to experience is such co-operation of police, hospital, and other authorities, as is implied in a hospital and accident ambulance system.

The Importance of an Ambulance System for London pre-eminently, as compared with other Cities.—The considerable proportion of the twenty-two thousand patients received into five only of the London hospitals in 1880, and all of the nearly three thousand due to horse

* Read before the Medical Society of London.

and vehicles accidents that in some years form but a fraction of the emergency cases whose annual aggregate is vastly greater in London than in any other metropolis. Not only the volume of the traffic, with its dangers, excitements, and delays, but the distances patients frequently have to traverse to reach the nearest hospital, are greater than in any other city. Owing to the unequal distribution of the general hospitals, a fracture, from the site of the accident within the registration area to the nearest general hospital—notably, if to the London, to Guy's, or to St. Thomas's Hospital—may have to be transported four to seven miles. This fact gives not only magnitude to the estimate of the avoidable evils arising from the absence of an ambulance system, but to all the reasons which suggest themselves for the adoption of such a system.

An Account of the Leading Points in the Ambulance Systems working or projected in other Cities.—Although the manner of working is not in each city alike, in all cases there are four invariable factors: these are—the police, the hospitals, the horse ambulance carriages, and the electrical communication. The points of difference in different cities concern chiefly the location and *personnel* of the ambulance carriage.

In Chicago, the principal hospital is at the outskirts of the city. With the police-stations, of course, it is otherwise; and at these the ambulances are kept. The *personnel* consists of policemen only. For the ambulance summons, a unique provision exists. At the corner of numerous streets are what resemble the ordinary pillar-post in miniature. Any one of several keys kept in the houses or shops in the immediate vicinity of one of these posts, on being introduced into the keyhole of its corresponding post, sounds an ambulance alarm at the police-station of that particular district, and, as quickly as it could be done by a fire-engine, the ambulance, at a gallop, appears on the spot. As a check to false or reckless alarm, each key, which is registered and numbered against the name of the holder, is so constructed that, once introduced, it can be withdrawn only by the ambulance driver, who delivers it back to its holder, and takes the patient to the hospital of the respective district.

In New York, Boston, and Philadelphia, the ambulances are kept at the hospitals only, horses for which, as is common to the system everywhere, are kept harnessed night and day. The *personnel* includes a house-surgeon, or substitute. The ambulance summons is sent by telephone from the police-station nearest the site of the accident to the head-quarters of the police, where, on a chart, is seen at once the hospital district of the address where the ambulance is required, and the telephonic summons is then forwarded to the hospital of that district. A diagnosis blank is filled up by the ambulance surgeon before removing the patient; and, immediately on returning to the hospital, this, with the time of departure, arrival, return, and other particulars, is entered in a book for that purpose. If, after the necessary attention, the patient desire it, and the surgeon approve of it, the patient may be transferred by the ambulance to his own home.

In Cincinnati, ambulances are kept at all the hospitals, and at some only of the police-stations. In Washington, they are kept at all the hospitals, and at every police-station. In each of these cities, the ambulances rival the fire-engines in promptness; and, from the general interest awakened by the ambulance carriages, not only amongst the police, but the people generally, there is so much familiarity with the provisions and rules of the system, that such intelligent co-operation as may be in any case expedient is rarely wanting.

In the neighbouring city of Paris, the project which has received the municipal approval consists in having horse ambulance stations, corresponding in their distribution to the former "Secours des Blessés" stations, forming together a distinct municipal organisation.

The Ambulance System and Ambulance Carriage of the London Hospital.—By reference to the diagram, it may be seen that, nearly equidistant and in different directions from the London Hospital, there are eight police-stations. If not in consequence of my suggestion, certainly in accordance with it, each of those stations, formerly in telegraphic connection with Scotland Yard, are now, by the cordial co-operation of Sir Edmund Henderson, being connected also with each other so as to form a distant, but complete, telegraphic ring around the hospital. Tapping this circle at one point, viz., the nearest police-station, by a telephonic wire thence to the hospital, it will be seen how, as represented on the diagram, the entire area round about the hospital is brought into direct communication with it. The cost of this wire for the first three months, I am given to understand, will be nothing, and afterwards, by special concession, below the usual rates. As one of the privileges of subscribers, and at no extra cost, this telephone may be connected at any moment with that of every other subscriber. Thus, every policeman within the London Hospital area having the addresses of the said subscribers within his beat, from the nearest private instrument of the already many hundred subscribers, the am-

bulance summons may be sent direct to the hospital. This is the outline of the plan I have submitted to the London Hospital Committee, and which, I trust, will soon be in complete working.

Fig. 1. *Explanation of Diagram.*—(Small circles) Police Stations.—(Single lines) Telegraphic Wires.—(Double lines) Telephonic Wire.—From Guy's Hospital south, there is no other general hospital whatever; from the London Hospital north, no other general hospital in any direction, except at Dalston.

The ambulance carriage, in the absence of which neither this nor any other scheme could take practical form, I thought at first to import from New York, that being the nearest place where any accident horse-ambulance could be procured. You will not regret to know, however,

Fig. 2. that as the ambulance of the London Hospital, which I shall show you to-night, was subsequently planned by me here, and built for me here, with express adaptation for the London service; it is, both in design

and in make, a London ambulance. In every leading particular, too, but one, it is different from any ambulance carriage previously constructed. The exception to which I allude is the interior counterpoise springs, used first in my military ambulance, so well described in Professor Longmore's book, and which, besides taking the highest International prize at the first Paris Exposition, were largely used in both the American and Franco-German wars.

The ambulance which I have now to describe, and which was presented to the London Hospital by its Vice-Chairman, is, I believe, the only accident ambulance carriage in civil life in Europe; certainly, I think the only one belonging to a general hospital. It is, briefly, a neat little apartment, 6 ft. 6½ in. by 4 ft. 1 in., in which, on a sliding litter with perfect surgical bed, the worst fractured patient, his attendant seated beside him, may be transferred, for example, from the most distant country seat in Scotland to the farthest Italian villa in safety, comfort, and seclusion. This seclusion may be maintained without a moment's disturbance until the patient, from the same litter, is shifted to his bed awaiting him in Italy. The size of this vehicle is arranged so that, whether shifted from road, boat, or rail, it requires no changes; and being all the time in running order, there need be no prolonged delays in the shiftings.

Fig. 3.

On looking at the outside, you see it is a light, rather pretty-looking, one-horse vehicle, the sides above the body-panels, as well as the front and rear, consisting of Brown ducts in detachable subsections, and small curtains. The floor of the vehicle is but twelve to fifteen inches from the ground; and between these the tailboard, when lowered, forms a firm, equidistant step. The hind wheel is large, and is in the centre of the body, the floor of which is below the axis of motion, while the spring from which the body is suspended is a very long semi-ellipse. The four wheels have India-rubber tyres. By a special contrivance of the running gear, the fore wheels and the entire carriage turn exactly on their own axis. Beneath the driver's seat is a box for medical and surgical appliances. Two red lamps beside the driver, and one in the rear, are used to prevent collision. The shafts are adapted to any cab-horse and harness. A centre-pole may be applied for two horses. In any case, however, it can, if necessary, be drawn by one man. The associate editor of the *Lancet* started and drew it in the shop with one little finger. This has been repeated by myself, even in an ordinary paved street. Looking at the interior, which is entered with the same ease as a room on the ground floor of any ordinary house would be, the right half of the floor is seen to be occupied by a light tramway, with India-rubber roller tires. The tramway rests on four light elliptical springs, the pair at the head being about six inches higher than those at the foot. Between the side of the tramway and the main body of the vehicle are India-rubber buffers. Resting upon the India-rubber rollers mentioned is a light cane-bottomed litter, with sliding handles. Upon the litter a waterproof thin hair mattress and pillow are used or not, as preferred.

The front litter-bearer walks into the ambulance far enough to rest his end of the litter on the rear roller, when, the rear bearer pushing with one hand, the patient is slid noiselessly, and with scarcely conscious motion, into position. With a very heavy patient upon it, I have done this myself with two fingers. Above the patient, from the roof, is a wide-looped pendant leather strap, by which the patient may steady or raise himself. A corresponding contrivance lower down can be attached for suspending a fracture, if desired.

In the other half of the interior is a detachable seat for the attendant, the remaining part of the floor being clear. Should two patients need transportation, a folding stretcher is detached from an angle of the

roof, the handles of which are received by leather loops, and by which the second patient is suspended parallel with the first.

Should it happen that, on the arrival of the ambulance, the patient is already on an ordinary police stretcher, or should four patients need transportation, a horizontal iron bar receives the front handles of the stretcher, and the iron-shod top of the tailboard the rear handles. Thus there is avoidance of shifting in the one case, and easy transportation for four patients in the other case, without the slightest interference of the one with the other; the attendant having, in this case, simply to ride outside, where there is excellent accommodation beside the driver.

Figs. 2, 3, 4. Explanation of Drawings.—(a. a.) Tramway.—(b. b.) Rubber Rollers.—(c. c.) Counterpoise Springs.—(d. d.) Litter.—(e. e.) Sliding Handles.—(f. f.) Attendant's Seat.—(g. g.) Tailboard.—(h. h.) Folding Stretcher.—(i. i.) Suspension Loops.—(m. m.) Supporting Bar for Police Stretcher.—(n. n.) Canvass Handles of Carrying Sheet.—(p. p.) Patient's Aid-strap.—(s. s.) Lateral Rubber Buffers.—The position of the head in both litter and stretcher is six or eight inches higher than the foot, as is not shown in the drawings.

Although, when perfectly closed, the light and air are not insufficient, by means of the eight little upper curtains, these can be increased at pleasure, without exposure of the patient to public gaze. Where the latter is no consideration, the eight sections forming the lower part of the sides above the body can also be removed, forming simply an open but roofed carriage.

The principal objective points obtained in this ambulance are these.

(a) *Ease of Entrance and Exit.*—In every other ambulance, civil or military, as also in every fever-carriage, the height of the floor necessitates several attendants, and such hoisting and lowering, pushing and hauling, as is particularly alarming and objectionable. The lowering of the floor, which so completely obviates this, was I believe, never before attempted or suggested. This, with the additional arrangement of the rubber rollers in the tramway, may be fairly said, I think, to make the ease of entrance and exit complete.

(b) *Ease of Motion in Transportation.*—The central position of the axle, the largeness of the rear wheel, the lowness of the floor below the axis of motion, the length of the semi-elliptical mainspring, the suspension of the body from this, together with the India-rubber tires, never before applied to a horse ambulance carriage, have each combined to secure the highest degree of steadiness attainable for the body of the vehicle. This minimum motion of the body of the vehicle, instead of being communicated to the patient, is intercepted; its chief force being expended upon the interior counterpoise springs, which, vertically and laterally, poise the tramway. Mr. Adams, the senior surgeon of the London Hospital, lying upon this litter at varying speeds, said it seemed almost easier in motion than at rest; and, in running the ambulance over successive pieces of loose wood, the crossing of them he detected rather by the alteration in the planes of the interior than by any conscious jar they occasioned. A gentleman, who, on a recent trial trip, went to take notes of the action of this litter, soon after the start forgot his purpose in a gentle slumber, induced, strange to say, by the roughness of the road, or, in other words, by the easy oscillations in traversing a street under repair.

By the principle of suspension, as illustrated in the attachment of the canvas stretcher, the conditions, though for a fracture case not so desirable as those of the litter, are for a medical case scarcely less agreeable; the elasticity of the stretcher-poles, as thus used, preventing the propagation of jar or shock to the patient.

One feature in this stretcher is as convenient as it is novel. Across the under side of the canvas, from which both poles and stretcher-bars may be easily and completely detached, are stitched four broad bands of the same material, terminating in firm loops slightly projecting beyond the lateral margin. On this carrying-sheet, to which the stretcher may be thus easily reduced, the patient may be carried easily and comfortably where the stretcher complete would not go. The ease with which it can be insinuated beneath, or withdrawn from under, a patient, or, when there, be left there, may be a great convenience, and avert much suffering.

(c) *Ventilation and Light, with or without exposure of the patient to public view, can be regulated to the utmost.*

(d) *Immunity from Contagion.*—The cane-bottomed litter is, without the mattress, sufficiently comfortable. The interior is then but wood and iron, and accessible to the quickest and most thorough cleansing.

(e) *Adaptability to other Uses.*—The tramway is readily detached from the floor. The interior, then quite clear, is adaptable to any purpose of pleasure or utility for which a vehicle might be desired in connection with an infirmary, hospital, or other institution.

My thanks are due to Mr. J. U. Burt, of the Swinton Street Carriage Works, for his patience and faithfulness in carrying out my designs in the construction of this vehicle.

SOME OF THE LEADING QUESTIONS WHICH WILL ARISE IN THE CONSIDERATION OF AN AMBULANCE SYSTEM FOR LONDON.

1. *The kind of Ambulance Carriage to be Employed.*—Should the carriage I have presented to your notice prompt somebody to the introduction of a better, my satisfaction would be so much the greater. To stimulate invention in this direction, the suggestion of prizes recently put forward by Sir Edmund Lechmere and Major Duncan would doubtless be of service.

2. *The Location and Personnel of the Ambulances.*—Shall they be stationed at the general hospitals, the police-stations, fire-stations, or at special ambulance-stations? If at any one of these only, which? If at more than one, at which other or others? For the police-stations, may be shown their superior number and distribution, the always available force at each; against them, the natural and rightful repugnance of the better classes, for whom the ambulances are equally intended, as well as indeed that of all other classes, to personal police attendance; while the absence of all good first care on the spot, and the uncertainties about admission, detention, or rejection, on reaching hospital, would be then as great as now. For the location of the ambulances at the hospitals, it may be said, the question is one of medical aid on the one hand, of public need on the other; affecting in a personal way, as no other question connected with hospitals could, those who, supporting the hospitals, are accustomed to look to them as the natural source of the best and rightful help, in a possible street-accident to themselves; and that the ambulance of the hospital would be but a natural and legitimate extension of the help it now gives, to the time it is first and perhaps most critically needed, and thus it would but complete the function it now partially fulfils. The facility for a medical attendant would be greater; there would be a guarantee against hospital-yard detention, of possible rejection, and delayed treatment; the help afforded would be disassociated from the now humiliating and criminal suspicions. For the hospitals, there would be evoked higher esteem; more personal sympathy, concern, and help from the subscribing classes. As regards the *personnel*, the rank of the medical attendant would be of little consequence, his competency of much; the work would be no harder than that to be expected in country or in army practice. The hospital would have, by this service, a new prize and another useful certificate to offer the deserving candidate, for a term as short as may be found expedient. In America, as a rule, the ambulance system is strictly a hospital-ambulance system. The medical attendant is usually what corresponds to a senior or junior dresser. No part of the scheme has so much secured the success and popularity of the system, as the quick medical help it guarantees to the entire public.

3. *Special Ambulance Stations.*—These might be at the same time small emergency hospitals, and in the outer and almost destitute seven mile belt of London, might have a relation to the general hospitals, corresponding to that between the field and the base military hospitals; the patients being drafted from the former into the latter as may be required.

4. *The Form and the Source of Ambulance Summons.*—In America the intercommunication between the respective police stations con-

tinues to be telegraphic—between the police and the hospitals it is telephonic, so that the call can be understood by anybody in attendance at either end of the wire. In regular course, the ambulance summons comes to the respective hospital from the head-quarters of the police; it may come, however, from any public or private telephone whatever. As an instance of the quickness of the service made possible by the telephone, only this morning Dr. Beckwith, of Washington, told me that on the occasion of an accident during the inauguration of President Garfield, he (Dr. Beckwith) himself telephoned from a neighbouring street; notwithstanding the unprecedented multitude in the streets, from the time of the summons to the arrival of the ambulance, was by his watch, exactly two minutes. Before long every police-station in London will be in telegraphic communication with every other. One of these stations is sure not to be very distant from a general hospital. One short telephonic wire therefore will put every police-station in communication with that hospital. Moreover every public and private telephone in London, by the ordinary method of connecting subscribers with each other, will thus be in communication also with every hospital telephone. A street accident occurring anywhere, a policeman guided by his list, from the shop or bank for example, next door perhaps, telephones to the respective ambulance the address where it is wanted. A purposely false summons would of course be a criminal act.

5. *The relation of the Police Department to the Ambulance System.*—This in any case must of course be integral. Whatever the system, it is necessary that every policeman should be intelligent as to the details of it, while the entire force must be in harmony with the other part of the organisation. On this point I am happy to say that by Sir Edmund Henderson, the Chief of the Metropolitan Police, I was long since authorised to state to whomsoever it might concern, that his practical co-operation may be fully relied upon.

6. *The Cost and how it is to be met?*—In America, as a rule, the hospitals have provided the necessary change in their premises; procured and maintained the ambulance horses, etc., complete, in working order, making themselves simply available; the municipalities have done the rest. The cost of the ambulance I show you will be, I think, from sixty guineas and upwards, little more than half the cost in New York of the ambulance there used. Telephonic communication costs at regular rates at present £45 a year, but for this service special concessions are promised. On the advent of the expected Government control of the telephonic service the subscription is expected to be lower and the distribution of it more general. An ambulance carriage is just the kind of thing many donors would like to give. An ambulance station is just the kind of thing many would like to endow, its daily benefit being to them daily visible. From my observation where the system is oldest, I believe that, if put on a voluntary basis, it would by its popularity probably elicit enough to support itself and do more than all things else combined to augment the hospital fund.

7. *The Expediency of attempted Complete Organisation at the outset or of allowing Gradual Development?*—This question confronted in its entirety, it must be admitted, promises no easy achievement. The hospital modifications, the police and telephonic arrangements, the harmonising of these with the heterogeneous and parochial administrations, like the obstacles which, incomparably greater, were surmounted by the railway, telegraphic, and fire-brigade systems, may not and should not be accomplished in a moment. The work, as initiated by the London Hospital, is, considering its importance, strikingly simple and easy. The neighbouring hospitals assuming a similar work for their respective districts, a fair proportion of the metropolitan area, as shown in the diagram, would be provided for, and the ultimate system or systems might be determined by gradual development.

8. *The Authority by which the ultimate Hospital and Accident Ambulance System for London shall be controlled.*—This must remain a question until, sooner or later, the time has fully come for the answer. The necessarily integral position of the police department in such system is suggestive. Of this I should venture to say there can be little doubt that, however successfully different districts may be separately worked, in order to the highest success, the entire organisation will ultimately be under one authority, so complete and absolute as to ensure corresponding responsibility and accountability in every subordinate whatsoever.

SOME OF THE RESULTS AND ADVANTAGES WHICH, FROM THE EXPERIENCE IN OTHER CITIES, MAY BE REASONABLY ANTICIPATED FROM A METROPOLITAN HOSPITAL AND ACCIDENT AMBULANCE SYSTEM IN LONDON.

1. Quickest possible medical aid, and best form of transportation, to the house or to hospital, in street accidents and other emergencies.

2. A sense of security which, by the knowledge of this provision, will be imparted to every rank and class throughout the entire community.

3. A more personal interest, a deeper sympathy, and a closer relation will be induced between the subscribing class and such hospitals as by their ambulance service shall manifestly include this within their most important provisions.

4. The sense of public obligation thus induced, and of which the ambulance carriages as they pass will be a daily reminder, should sensibly augment the hospital revenues, both by multiplying contributions and by promoting endowments.

5. As a substitute for the much discussed redistribution of hospitals, it offers a simple form of hospital extension, the ambulance bringing the hospital to the spot, however distant, where the patient is.

From personal observation in nearly every city where an ambulance system exists, I should say that in everyone of them the ambulance department for the saving of life has come now to be deemed almost as important as the more expensive fire department for the saving of property; that now to abolish the one, would be as difficult as to abolish the other.

One of the earlier results of the "Hospital and Accident Ambulance Service of London" which I venture to predict, is a general expression of surprise it was not adopted before.

CLINICAL MEMORANDA.

NERVE-STRETCHING IN TETANUS.

My attention has been called to a letter in your issue of January 7th, from Mr. Henry Clark of Glasgow, in which he congratulates me on the successful result of my case of nerve-stretching in traumatic tetanus, lately published in the *Proceedings* of the Surgical Society of Ireland, but takes exception to my statement, that I believed it was the only case in which the operation had been done successfully, with that object, in the United Kingdom; afterwards referring to one unrecorded case, and to the published details of a successful case of traumatic tetanus which he treated by nerve-stretching. I mentioned in my communication that I knew of only one fully recorded case (Paul Vogt's). It was the first time the operation had been performed in Ireland for the cure of traumatic tetanus; and on information from undoubtedly good authority (already quoted) I based my convictions.

I have yet to learn by what means unrecorded cases can be alluded to; and regret Mr. Clark's case escaped my notice, as it would have afforded me pleasure to cite it, and it would have been an additional proof of the value of such procedure, in my opinion not yet sufficiently prominent before the profession. W. I. WHEELER, Dublin.

A CASE OF CATALEPSY.

THE following case, which I met with on board a ship lately bound for Adelaide from London, is one of some interest. I was called one night to F. C., a passenger, a weakly nervous man, aged 26, who was stated to be in a fit. When I first saw him, he was struggling violently in the arms of those who held him, crying, and attempting to tear his hair, and calling now and again for his wife, whom he had left behind in England, and for his child, who, as I heard afterwards, died some months ago. He was plainly in a state of hysterical excitement, consequent on leaving home. In a few minutes, he suddenly became quiet, and remained perfectly still in the position in which he had been laid down. The eyes were wide open, the pupils equal and contracting under the influence of light, though not markedly so. Respiration was very shallow, but regular, and at the rate of fifteen per minute. Pulse 90, of fair quality. Sensation, or, at least, the power of reflex action, was abolished. The finger might be placed on the eyeball without exciting wincing: a pin driven into the skin of the arm was apparently unfelt. I placed his limbs in various unsupported positions; bent his fingers at any angle; shut his mouth, which was open; and closed one eye, without any effort on his part to alter the position of the parts as I had disposed them. He remained in this cataleptic condition for an hour and a half, when he gradually came to himself, and recognised those around him. In a few minutes, he fell into a natural sleep, having first stated that he had been aware of my presence all the time, and had heard the few words I had spoken. Next morning, however, he seemed to have no recollection at all of any matter between the period previous to his fit and the morning when he found himself in his berth. As he complained of sleeping badly, as a rule, I gave him a draught the following night at 10 P.M., consisting of fifteen grains of chloral-hydrate, and twenty grains of bromide of potassium. At 10.20, he became again completely cataleptic; but in twenty minutes he again fell into natural sleep, without any interval of consciousness. He did not suffer again in this manner. The sea-voyage, combined with nerve-tonics and a liberal diet, seemed to have made a different man of him.

I should be glad to hear of similar cases of catalepsy, and to know the results of galvanism in this state. I was unfortunately without a battery of any kind.

C. EMILIUS THOMPSON, Adelaide, S. Australia.

A CASE OF PARALYSIS, TREATED BY ELASTIC EXTENSION.

A FEW months ago, a case of paralysis, of five months' standing, was brought to me. The patient was a young lad aged 15, and the disease at first came upon him gradually, he being able to walk, although with difficulty, for some weeks. There then occurred sudden and total loss of motor power in the lower part of the body, and he became unable either to stand or sit up. Sensation, however, remained intact everywhere.

Before coming to me, he had been systematically galvanised for three months, but without any benefit whatever. Reflex motor power was slightly impaired, but good. There was no tenderness in any region of the spine; but a peculiar forward protrusion of the chin, together with the above-mentioned symptoms, led me to diagnose curvature in the cervical region, leading to paralysis of motion from pressure upon the anterior columns of the spinal cord; and to adopt gradual extension in treating the case.

The patient was laid upon a bed, the head of which was very much raised. The body, from the shoulders downwards, was fixed to an upright pillar at the foot of the bed, by means of ropes attached to each side of a tightly fitting waistcoat; and extension of the head was then made by means of a halter with chin-strap, pulling in a direction running through the crown of the head.

The extending power was one I have seen used by Dr. T. J. Walker of Peterborough, and consisted of an elastic ring and metal chain, fixed to the halter. By putting the elastic on the stretch, and fixing the chain to an upright pillar at the head of the bed, continual gradual extension was secured, the chain being tightened a link or two as the elastic slackened. This apparatus was used during the day only, for two months, with very good results. In one month, the patient began to move his toes, and every day afterwards the motor power returned to his lower limbs, and he became able to get up. A pulley was then fixed to the ceiling, and he was instructed to pull himself up by the rope several times a day. In a few weeks, he was able to walk with assistance; and now (four months after the commencement of the extension) he can walk steadily and well without help.

I think, now, of applying an immovable support to the back and neck for a few months; and perhaps some member will give me his experience of supports for the neck, in plaster or other material. Plaster-jackets I have frequently applied after Dr. Walker's method; but there may be lighter and more suitable materials for the neck.

C. R. ILLINGWORTH, M.B., Clayton-le-Moors, Accrington.

THERAPEUTIC MEMORANDA.

NAPHTHOL IN PSORIASIS.

IN the BRITISH MEDICAL JOURNAL of the 14th January, page 47, Mr. Balmanno Squire gives an account of the failure of this remedy to cure one case of psoriasis, and of its success (in the strength of 50 per cent., the patient being aged 12) in blistering the skin. He therefore takes a very unfavourable view of its efficacy—a conclusion which is hardly warranted by the solitary case he has published.

With reference to this point, Professor Kaposi, in the new edition of his work on skin-diseases (*Path. und Therapie der Hautkrankheiten*, ed. 2, p. 406), speaks as follows. "In psoriasis, an ointment of naphthol (ung. emoll. 100, naphthol 15) does not act so promptly as chrysarobin and pyrogallie acid, but still often with great rapidity, especially in old patches of the elbows and knees, and is especially to be recommended in psoriasis of the face, head, and hands, as it does not discolour the skin and hair. It should be painted on twice a day for six days, and washed off on the seventh with soap, etc.; or daily washing with soap and application of ointment may be used alternately. Occasionally, the ointment gives rise to a burning sensation in the skin, lasting for some time, which is alleviated by starch-powdering. Inflammation of the skin, boils, and eczema are never caused by it. Out of the plentiful stock of remedies and methods which have been enumerated, the physician has to choose the right one, always giving due consideration to the character and intensity of the disease, and to the individual peculiarities and external circumstances of the patient."

Perhaps, if Mr. Squire will attend to Professor Kaposi's recommendations, he may find himself more able "to support the observations of the able Viennese professor".

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